



Wildlife Act Authority for wildlife on non-public conservation land

Authorisation Number: 118705-FAU

THIS AUTHORITY is made this 9th day of June 2025

PARTIES:

The Director-General of Conservation and where required the Minister of Conservation (the Grantor)

AND

Graymont (NZ) Ltd (the Authority Holder)

BACKGROUND

- A. The Director-General of Conservation is empowered to issue authorisations under the Wildlife Act 1953.
- B. The Authority Holder wishes to exercise the authorisation issued under the Wildlife Act 1953 subject to the terms and conditions of this Authority.

OPERATIVE PARTS

In exercise of the Grantor's powers the Grantor **AUTHORISES** the Authority Holder under Section 53 of the Wildlife Act 1953, subject to the terms and conditions contained in this Authority and its Schedules.



SIGNED on behalf of the Grantor by [REDACTED], Operations Manager, King Country acting under delegated authority in the presence of:



Witness Signature – [REDACTED], Operations Support Officer

A copy of the Instrument of Delegation may be inspected at the Director-General's office at 18-32 Manners Street, Wellington.

SCHEDULE 1

1.	Authorised activity (Schedule 2, clause 2)	a) Activities authorised for a certain purpose: i. Catch alive and liberate the protected wildlife referred to in Schedule 4. ii. Incidentally kill the protected wildlife referred to in Schedule 4 provided all reasonable steps are taken in accordance with this authority to avoid killing wildlife. b) Purpose of authorisation: i. To protect lizards by way of salvage. c) Quantity authorised: i. As indicated in Schedule 4. d) Methodology: i. In accordance with the amended Lizard Management Plan attached as Schedule 7.
2.	The Land (Schedule 2, clause 2)	a) Catch alive and kill: Opārure Quarry, Te Kuiti on the map attached as Schedule 5. b) Liberate: As indicated on the map attached as Schedule 6.
3.	Personnel authorised to undertake the Authorised Activity (Schedule 2, clause 3)	a) [REDACTED] b) [REDACTED] c) [REDACTED] d) [REDACTED] e) Suitably qualified ecologists employed or contracted by the Authority Holder provided that they are under the direct supervision of those listed in this Authority.
4.	Term (Schedule 2, clause 4)	Commencing on and including 9 th June 2025 and ending on and including 8 th June 2035
5.	Authority Holder's address for notices (Schedule 2, clause 8)	The Authority Holders address in New Zealand is: Level 4 214 Collingwood Street Hamilton 3204 New Zealand Email: [REDACTED]
6.	Grantor's address for notices	The Grantor's address for all correspondence is: Permissions Team Level 4 73 Rostrevor Street Hamilton, 3204 Email: permissionshamilton@doc.govt.nz

SCHEDULE 2

STANDARD TERMS AND CONDITIONS OF THE AUTHORITY

1. Interpretation

- 1.1 The Authority Holder is responsible for the acts and omissions of its employees, contractors or, agents. The Authority Holder is liable under this Authority for any breach of the terms of the Authority by its employees, contractors or agents as if the breach had been committed by the Authority Holder.
- 1.2 Where obligations bind more than one person, those obligations bind those persons jointly and separately.

2. What is being authorised?

- 2.1 The Authority Holder is only allowed to carry out the Authorised Activity in the Land described in Schedule 1, Item 2.
- 2.2 The Authority Holder must advise the Department of Conservation's local Operations Manager(s) one week prior to carrying out the Authorised Activity in the District, when the Authority Holder intends to carry out the Authorised Activity.
- 2.3 Any arrangements necessary for access over private land or leased land are the responsibility of the Authority Holder. In granting this authorisation the Grantor does not warrant that such access can be obtained.
- 2.4 The Authority Holder and Authorised Personnel must carry a copy of this Authority with them at all times while carrying out the Authorised Activity.
- 2.5 The Authority Holder may publish authorised research results.
- 2.6 The Authority Holder must immediately notify the Grantor of any taxa found which are new to science. In addition, the Authority Holder must lodge holotype specimens and a voucher specimen of any new taxa with a recognised national collection.

3. Who is authorised?

- 3.1 Only the Authority Holder and the Authorised Personnel described in Schedule 1, Item 3 are authorised to carry out the Authorised Activity, unless otherwise agreed in writing by the Grantor.

4. How long is the Authority for - the Term?

- 4.1 This Authority commences and ends on the dates set out in Schedule 1, Item 4.

5. What are the liabilities?

- 5.1 The Authority Holder agrees to exercise the Authority at the Authority Holder's own risk and releases to the full extent permitted by law the Grantor and the Grantor's employees and agents from all claims and demands of any kind and from all liability which may arise in respect of any accident, damage or injury occurring to any person or property arising from the Authority Holder's exercise of the Authorised Activity.

5.2 The Authority Holder must indemnify the Grantor against all claims, actions, losses and expenses of any nature which the Grantor may suffer or incur or for which the Grantor may become liable arising from the Authority Holder's exercise of the Authorised Activity.

5.3 This indemnity is to continue after the expiry or termination of this Authority in respect of any acts or omissions occurring or arising before its expiry or termination.

6. What about compliance with legislation and Grantor's notices and directions?

6.1 The Authority Holder must comply with all statutes, bylaws and regulations, and all notices, directions and requisitions of the Grantor and any competent Authority relating to the conduct of the Authorised Activity. Without limitation, this includes the Conservation Act 1987 and the Acts listed in the First Schedule of that Act and all applicable health and safety legislation and regulation.

7. When can the Authority be terminated?

7.1 The Grantor may terminate this Authority at any time in respect of the whole or any part of Authorised Activity if:

- (a) the Authority Holder breaches any of the conditions of this Authority; or
- (b) in the Grantor's opinion, the carrying out of the Authorised Activity causes or is likely to cause any unforeseen or unacceptable effects.

7.2 If the Grantor intends to terminate this Authority in whole or in part, the Grantor must give the Authority Holder such prior notice as, in the sole opinion of the Grantor, appears reasonable and necessary in the circumstances.

8. How are notices sent and when are they received?

8.1 Any notice to be given under this Authority by the Grantor is to be in writing and made by personal delivery, by pre-paid post or email to the Authority Holder at the address, fax number or email address specified in Schedule 1, Item 5. Any such notice is to be deemed to have been received:

- (a) in the case of personal delivery, on the date of delivery;
- (b) in the case of post, on the 3rd working day after posting;
- (c) in the case of email, on the date receipt of the email is acknowledged by the addressee by return email or otherwise in writing.

8.2 If the Authority Holder's details specified in Schedule 1, Item 5 change then the Authority Holder must notify the Grantor within 5 working days of such change.

9. What about the payment of costs?

9.1 The Authority Holder must pay the standard Department of Conservation charge-out rates for any staff time and mileage required to monitor compliance with this Authority and to investigate any alleged breaches of the terms and conditions of it.

10. Are there any Special Conditions?

- 10.1 Special conditions are specified in Schedule 3. If there is a conflict between this Schedule 2 and the Special Conditions in Schedule 3, the Special Conditions will prevail.

11. Can the Authority be varied?

- 11.1 The Authority Holder may apply to the Grantor for variations to this Authority.

SCHEDULE 3

SPECIAL CONDITIONS

1. Adhere to approved application

- 1.1 The Authorised Activity must be undertaken in accordance with the Lizard Management Plan attached to Schedule 7, subject to the terms and conditions in this Authority.
- 1.2 Notwithstanding Schedule 3, Special Condition 1.1, if there is a conflict between the Lizard Management Plan under Schedule 7, and the terms and conditions of this Authority, the terms and conditions of this Authority prevail.
- 1.3 The Authority Holder is responsible for the acts and omissions of its employees, contractors, or agents. The Authority Holder is liable under this Authority for any breach of the terms of the Authority by its employees, contractors or agents as if the breach had been committed by the Authority Holder.
- 1.4 In addition to Schedule 2, clause 2.2, the Authority Holder must notify mana whenua one week prior to carrying out the Authorised Activity and provide an opportunity for mana whenua to be present, should they wish to (patai@tnn.co.nz) C/- Te Whare Ki Te Tokanganui-a-noho and Oparure Marae.

2. Killing wildlife

- 2.1 The Authority Holder is permitted to kill wildlife provided reasonable efforts have been made to meet all of the terms and conditions expressed and implied in this Authority.

3. Salvage relocation and habitat enhancement

- 3.1 The Authority Holder must perform actions as set out in the contingencies/adaptive management sections of the Lizard Management Plan to ensure adequate mitigation of effects has been achieved. This includes providing adequate protection of the release site (i.e. creation of a QE2 covenant).
- 3.2 The DOC Operations Manager for King Country (tekuiti@doc.govt.nz) is to be contacted immediately for further advice if wildlife other than those listed in Schedule 1 are located within the footprint of the development or within the release site.

4. Ownership of absolutely protected wildlife

- 4.1 This Authorisation gives the Authority Holder the right to hold absolutely protected wildlife in accordance with the terms and conditions of the Authorisation, but the wildlife remains the property of the Crown. This includes any dead wildlife, live wildlife, any parts thereof, any eggs or progeny of the wildlife, genetic material and any replicated genetic material.
- 4.2 Unless expressly authorised by the Grantor in writing, the Authority Holder must not donate, sell or otherwise transfer to any third party any wildlife, material, including any genetic material, or any material propagated or cloned from such material, collected under this Authority.

5. Lizard capture and handling

- 5.1 If required in writing by the Grantor, the Authority Holder must make such improvements to techniques (including catching, handling, releasing, preserving and storing), and take such other steps as directed by the Grantor.
- 5.2 Lizards must only be handled by Authorised Personnel listed in Schedule 1 Item 3, or under the direct supervision of the Authorised Personnel.
- 5.3 Lizard capture, handling and relocation must be undertaken between the 1st October and 30th April when lizards are most active.
- 5.4 Capture and handling of lizards must involve only techniques that minimise the risk of infection or injury to the animal.
- 5.5 Capture and handling methods shall follow those described in the Herpetofauna inventory and monitoring toolbox <http://www.doc.govt.nz/our-work/biodiversity-inventory-and-monitoring/herpetofauna/>.
- 5.6 The Authority Holder must ensure all live capture traps are covered to protect lizards from exposure and minimise stress. Damp leaf litter or other material must be provided to reduce desiccation risk and the bottom of the pit-fall trap must be perforated to allow drainage of water.
- 5.7 The Authority Holder must ensure all live capture traps, (e.g., pitfall traps and G-minnow traps), are checked at least every 24 hours.
- 5.8 The Authority Holder must sterilise any instruments that come in contact with the lizards and/or are used to collect or measure lizards between each location. A separate holding bag must be used for each animal. All gear should be thoroughly cleaned and dried between sites.
- 5.9 The Authority Holder must ensure lizards are temporarily held individually in a suitable container (e.g., breathable cloth bag) and held out of direct sunlight to minimise the risk of overheating, stress and death.
- 5.10 The Authority Holder is strongly encouraged to adhere to current best practice hygiene protocols when visiting sites of known native frog populations to avoid the spread of pest organisms such as chytrid fungus.

6. Death of wildlife associated with salvage activities

- 6.1 If any lizards should die during the authorised activities of catch, transfer, or liberate, the Authority Holder must:
 - a. inform the Grantor and mana whenua within 48 hours; chill the body if it can be delivered within 72 hours, or freeze the body if delivery will take longer than 72 hours; and
 - b. send the body to Massey University Wildlife Post Mortem Service for necropsy along with details of the animal's history; and
 - c. pay for any costs incurred in investigation of the death of any lizard; and
 - d. if required by the Grantor, cease the Authorised Activity for a period determined by the Grantor.

- e. Follow all instructions regarding the disposal of the body.

7. Lizard Salvage Reporting

7.1 A report is to be submitted in writing to the DOC Operations Manager King Country (tekuiti@doc.govt.nz), permissionshamilton@doc.govt.nz and Te Nehenehenui Trust (patai@tnn.co.nz C/- Te Whare Ki Te Tokanganui-a-noho and Oparure Marae) within three months of the salvage being completed, summarising outcomes in accordance with the Lizard Management Plan. Each report must include:

- the permission number; and
- the species and number of any animals collected and released; and
- the GPS location (or a detailed map) of the collection point(s) and release point(s); and
- results of all surveys, monitoring or research; and
- description of how the Lizard Management Plan was implemented including any difficulties encountered with capture and handling, how release sites were assessed, post release monitoring and what contingency actions were required.

7.2 Completed Amphibian and Reptile Distribution System (ARDS) cards for all herpetofauna sightings and captures ([Report a sighting: Amphibian and reptile species sightings and observations \(doc.govt.nz\)](#)) must be sent to Herpetofauna, Department of Conservation, National Office, PO Box 10420 Wellington 6143 or herpetofauna@doc.govt.nz.

8. Termination

8.1 A new clause 7.1 (c) is added to Schedule 2, to read as follows: "Or for any other reason that the Grantor may decide".

9. Variation

9.1 A new clause 11.2 is added to Schedule 2, to read as follows: "The Grantor may vary this Authority for any other reason that the Grantor may decide."

10. Revocation

10.1 The Grantor may revoke and replace this Authority or any part thereof.

SCHEDULE 4

SPECIES

Common Name(s)	Scientific name	Quantity
Copper skink	<i>Oligosoma aeneum</i>	Up to 150
Ornate skink	<i>O. ornatum</i>	Up to 10



SCHEDULE 5

MAP OF THE LAND - CATCH ALIVE AND KILL

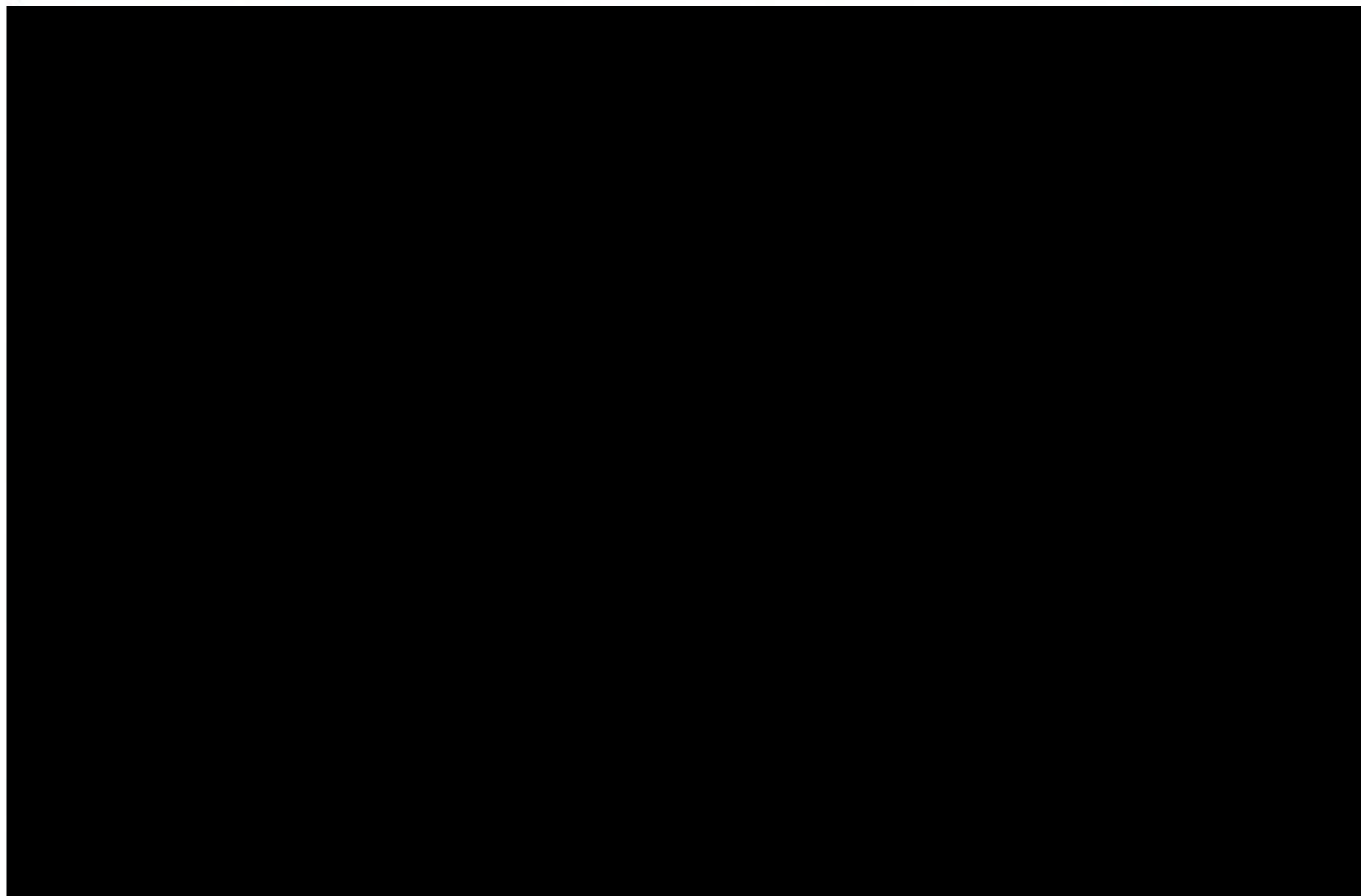


Figure 1: Location of GNZL land (yellow lines) and 26 ha LMP site (orange shaded polygon) that takes in 24 ha of virgin ground and ca. 2 ha of existing Opārure Quarry infrastructure. The western pit is also shown (red lines).

SCHEDULE 6

MAP OF THE LAND - LIBERATE

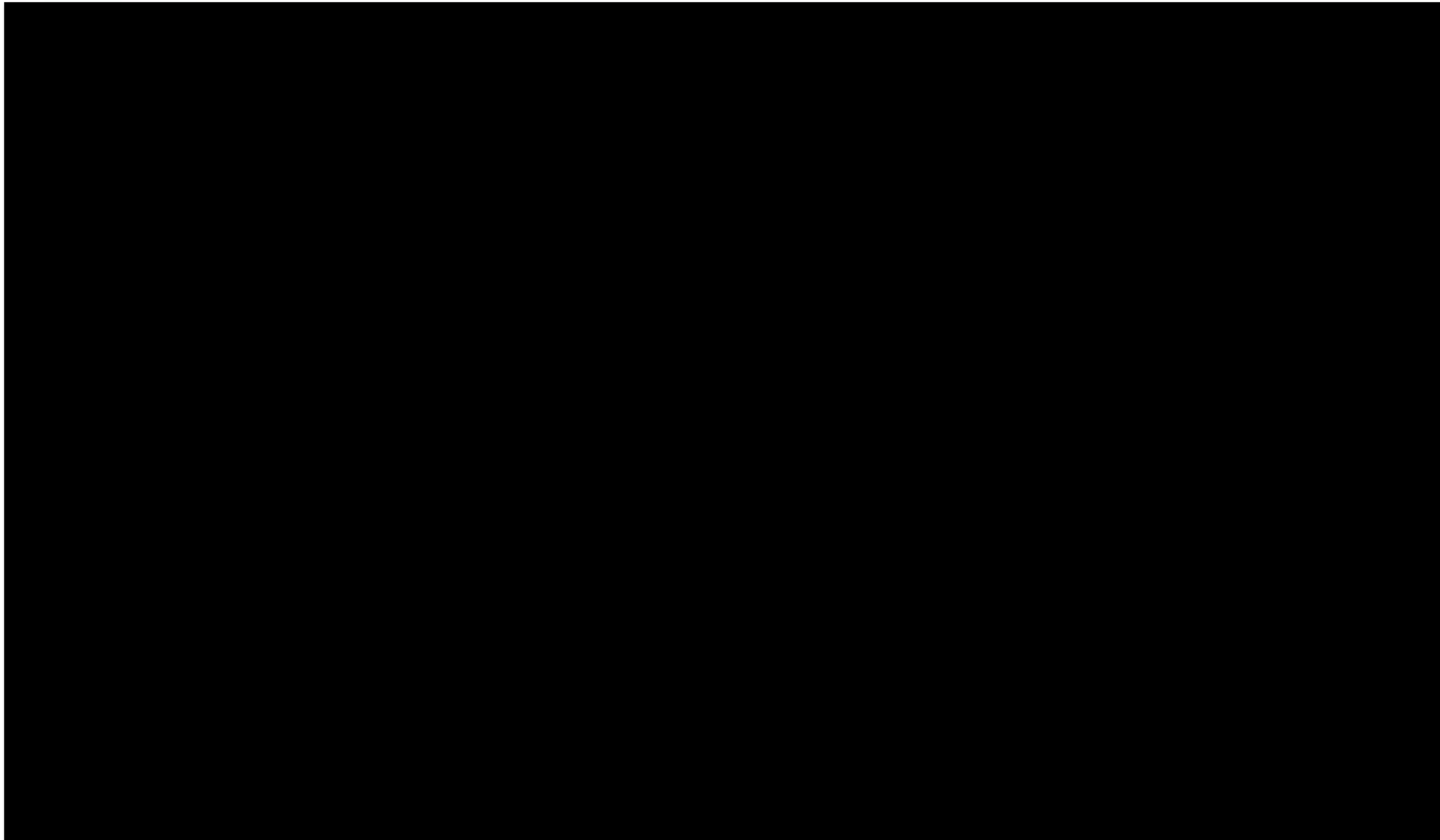


Figure 13: Location of the 0.5 ha release area (green edged polygon) within the ca. 2.6 ha rehabilitated link area (red edged polygon) between the two proposed SNA gullies. Yellow dots=copper skink detections through survey.



Department of Conservation
Te Papa Atawhai

SCHEDULE 7

LIZARD MANAGEMENT PLAN

Phase 1: Western Pit & Haul Road Project

Lizard Management Plan



Copper skink *Oligosoma aeneum* & copper skink habitat

November 2024



LizardExpertNZ

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Disclaimers and Limitations

This report (**'Report'**) has been prepared by LizardExpertNZ (LENZ) exclusively for Graymont (NZ) Limited (**'Client'**) in relation to Lizard Management of the Phase 1: Western Pit & Haul Road project (**'Purpose'**). The report relies on information provided by Graymont (NZ) Limited. LENZ accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the provided information. Findings in this Report are based on and are subject to any assumptions specified in the Report. LizardExpertNZ accepts no liability whatsoever for any reliance on or use of this Report, in whole or in part, for any use or purpose other than the Purpose or any use or reliance on the Report by any third party.

1. Executive Summary

Graymont (NZ) Ltd (GNZL) are in the process of obtaining resource consent to extend its existing operations at Opārure Quarry, Te Kuiti. The proposed extension and the subject of this LMP is termed 'Phase 1 of the Western pit and Haul Road project' ('Phase 1 western pit project'). The Phase 1 western pit project takes in 26 ha of predominately pastoral land with some karst features west of the existing Opārure Quarry (the 'LMP Site' Figure 1).

Two species of indigenous lizards have been found over the LMP site through survey. The 'Not Threatened'¹ copper skink is widespread over the site and the ornate skink (At Risk Declining) is present but relatively very rare (1 individual found). Despite searches targeting geckos, none were found nor suspected present. Habitats for both copper and ornate skinks are in discrete areas within the predominately pastoral setting of the LMP site and are estimated to make up only 2 % of the 26-ha Phase 1 western pit project footprint. Lizard habitats are highly modified and are exposed to the full range of exotic browsers and lizard predators as well as trampling by sheep.

Developing Phase 1 of the western pit project will result in a variety of actual and potential adverse effects on resident skink populations and their habitats. Many positive effects to lizards of the LMP site and the wider area may also arise through the implementation of an 'Ecological Betterment Plan'² that provides for general environmental enhancement through the implementation of a myriad of site-specific management plans, including this Lizard Management Plan (LMP).

The 'Mitigation Package' proffered in Section 8 of this LMP is heavily weighted towards mitigation of adverse effects through a thorough lizard salvage with release into an area of habitat considered more suitable for affected skinks than habitat over the LMP site. No compensation is required to address residual effects due to the rehabilitation with rodent control proposed at the release site, along

¹ Hitchmough *et al.* 2021. Conservation status of New Zealand reptiles, 2021. New Zealand Threat Classification Series 35. Department of Conservation, Wellington. 15 p.

² Western Pit Ecological Betterment Plan. Draft, 2nd October 2024. Prepared by Pattle Delamore Partners Ltd.

with permanent protection that will more than balance anticipated effects.

Best Practice Lizard Management Plans

This LMP has been prepared to achieve a high-level of adherence with the DOC LMP template.³ This ensures that the information required by DOC to process the Wildlife Act permit for Phase 1: Western pit and Haul Road project is captured in this LMP.

2. Project Background

Graymont (NZ) Ltd (GNZL) own ca. 415 ha of rural sheep/pastoral land west of Te Kuiti, Waikato (Figure 1). A large area of the land is subject to an existing lime quarry operation, the 'Opārure Quarry' with the balance farmed (grazed with sheep). The GNZL land is notable for its indigenous forest remnants and karst features such as caves and limestone outcroppings, an ecosystem type considered rare in New Zealand.⁴

GNZL are in the process of seeking resource consent to extend its existing operations at Opārure Quarry westward. The proposed extension is termed 'Phase 1: Western pit and haul road project' and the footprint takes in 26 ha of predominately pasture west of the existing Opārure Quarry (orange shaded area in Figure 1; the 'LMP Site'). Of the 26-ha, ca. 24 ha is virgin ground, the balance being existing plant/roading of the existing Opārure Quarry. Although this LMP only pertains to Phase 1 of the western pit and haul road project, ultimately GNZL will develop a much larger area (ca. 94 ha) of the western pit over an estimated 83 years (Figure 1). Phases over the western pit beyond Phase 1, however, will be the subject of future LMPs.

To develop the LMP site the complete and permanent clearance of pasture, remnants of indigenous vegetation and karst features will be required, some of which provide habitat for copper skink (*Oligosoma aeneum*), and ornate skink (*O. ornatum*). Ornate skinks are relatively rare over the site with copper skinks widespread and

³ DOC, 2018. Guidelines and model for producing management plans for New Zealand lizards Department of Conservation Lizard Technical Advisory Group.

⁴ Williams, P.A., Wiser, S., Clarkson, B., Stanley, M.C. 2007. New Zealand's historically rare terrestrial ecosystems set in a physical and physiognomic framework. *New Zealand Journal of Ecology* 31 (2): 119-128; Holdaway, R.J., Wiser, S.K., & Williams, P.A. (2012). Status assessment of New Zealand's naturally uncommon ecosystems. *Conservation Biology*, 26(4), 619-629.

easily encountered through survey, but only where suitable habitat persists (large limestone boulders and decomposing logs).

The western pit and haul road project is subject to a large array of draft management plans, including a preliminary LMP⁵ fully superseded by this LMP. The preliminary LMP does not contain all the information required by the Department of Conservation (DOC) to issue a Wildlife Act (1953) permit for the project. The purpose of this LMP, therefore, is to build on the preliminary LMP and create an LMP that will serve the dual purpose of managing any adverse effects under the RMA (1991) and supporting an application for Wildlife Act (1953) authority from the Department of Conservation to develop the LMP site.

3. Scope & Goals of this LMP

‘The Land’

The LMP site depicted in Figure 1 takes in 26-ha of private land managed by Graymont (NZ) Ltd (GNZL) in the vicinity of Te Kuiti.

The Purpose

This Lizard Management Plan (LMP) has the dual purpose of being a requirement of Waikato Regional Council (WRC; Condition 17, Appendix 1a), and of supporting a Wildlife Permit application to DOC to construct and operate the extension of the existing Opārure Quarry over areas of indigenous lizard habitat. A Wildlife Permit is required to construct/operate the western pit and haul road as all indigenous lizard species are absolutely protected under the Wildlife Act (1953) including the ‘not threatened’ copper skink.

This LMP stands alone and seeks to manage adverse effects on lizard values independently of any other effects management related to the Phase 1 project. That said, the LMP site is subject to a myriad of other draft management plans (see Appendix 1a & ‘Existing Draft Management Plans’ below) some of which may yield positive benefits to lizards. As such, this LMP was prepared in general accordance with all relevant plans and documents⁶, but any positive

⁵ Pakeho Pit, Graymont Quarry Lizard Management Plan, prepared by Ecology New Zealand Ltd. 2nd February 2022.

⁶ E.g., Western Pit Ecological Betterment Plan. Draft, 2nd October 2024. Prepared by Pattle Delamore Partners Ltd.; and Pakeho Pit, Graymont Quarry Lizard Management Plan” was prepared by Ecology New Zealand Ltd and is dated 2 February 2022.

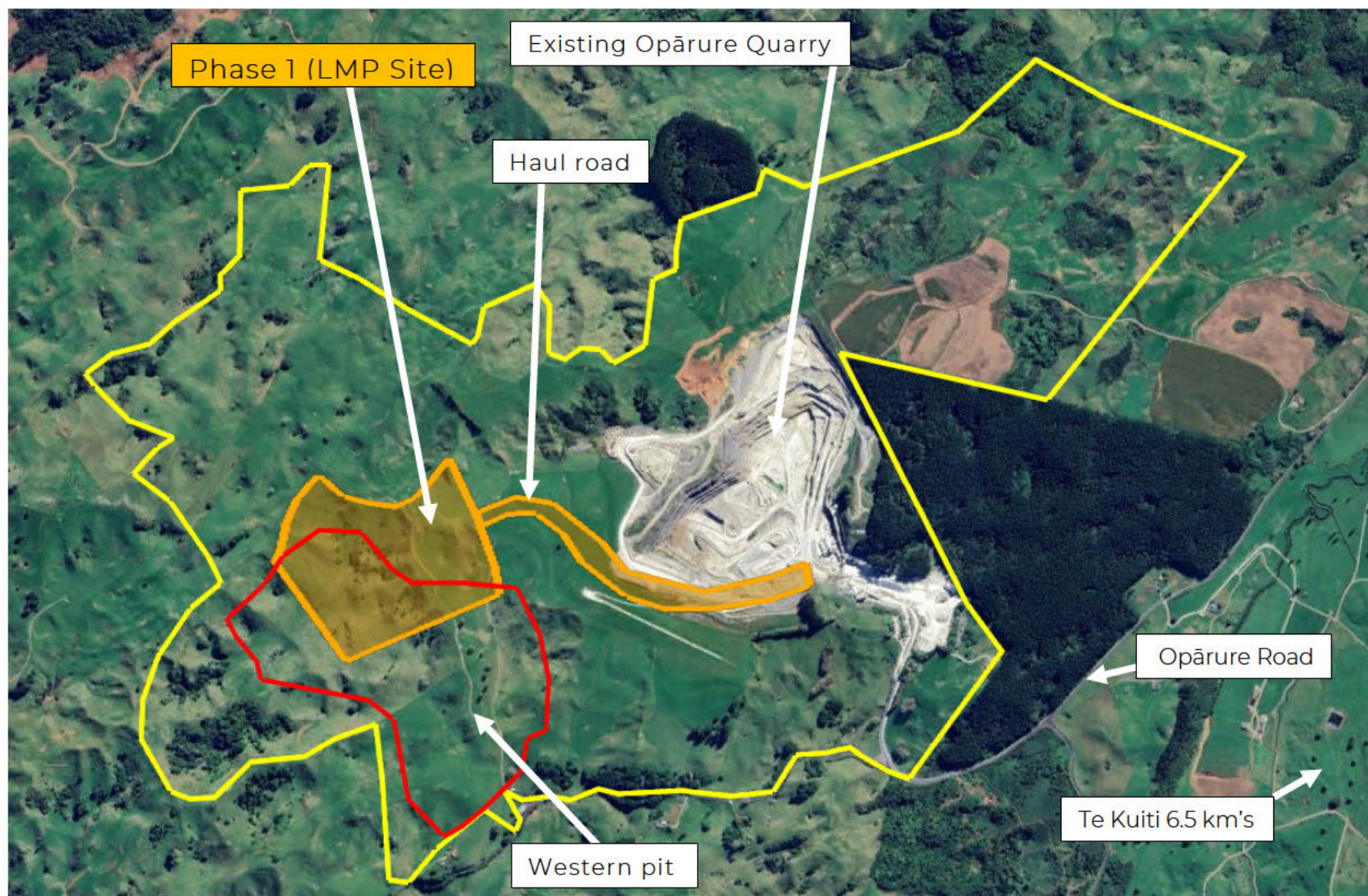


Figure 1: Location of GNZL land (yellow lines) and 26 ha LMP site (orange shaded polygon) that takes in 24 ha of virgin ground and ca. 2 ha of existing Opārure Quarry infrastructure. The western pit is also shown (red lines).

effects that may ensue from the implementation of other management plans are accorded no weighting in the residual effects assessment (see Section 8). This LMP is also broadly consistent with recommendations made within a ‘Terrestrial Ecological Impact Assessment report’⁷ that formed Appendix M of the Assessment of Environmental Effects (AEE) lodged with councils for Resource Consent.

This Lizard Management Plan (LMP) seeks to manage the lizard values of the LMP site to achieve an *overall protective benefit* for copper and ornate skinks locally (within Graymont NZL land holdings; Figure 1). This ‘overall protective benefit’ goal is consistent with DOC advice relating to lizard species absolutely protected under the Wildlife Act (1953).⁸

Planning Context

In applying for resource consent from WRC⁹, GNZL has offered a lizard management plan (LMP) condition (see Appendix 1a). The higher-level plans under which the LMP is positioned are the “*New Pit & Haul Road Site Management Plan*” and the “*Ecological Betterment Plan*” (Condition 17, Appendix 1a). The New Pit & Haul Road Site Management Plan has the objective to “*avoid, remedy, manage or offset the identified environmental effects of the Proposal*” (proffered Condition 16; Appendix 1a). This objective, therefore, has direct relevance to effects management under this LMP. Moreover, and as noted above, this LMP has regard to the recommendations in the AEE that relate to lizards (Appendix M of the AEE), and from which the LMP conditions were based.

The ‘Mitigation Package’ detailed in Section 8 of this LMP addresses this objective. Avoidance of adverse effects over the Phase 1 western pit and haul road project footprint is not possible given the complete loss of all above-ground terrestrial habitats. Instead, this LMP is weighted heavily towards mitigation of adverse effects by way of a

⁷ This report, entitled “Terrestrial Ecological Impact Assessment report: Pakeho Pit, Graymont Quarry” was prepared by Ecology New Zealand Ltd and is dated 22 September 2022.

⁸ Recent Wildlife Act (1953) case law directs DOC decision makers to only approve Wildlife Act authorities that demonstrate an overall protective benefit for wildlife affected. This is the legal test that must be met to allow DOC to permit the activity.

⁹ GNZL require resource consent from both Waitomo District and Waikato Regional Councils. No additional lizard-related conditions are expected under the Operative Waitomo District Plan.

comprehensive salvage regime, that has a high level of adherence to best-practice salvage principles.¹⁰ No compensation will be required to address residual effects due to the quality/quantity of mitigation proposed, that will more than balance any residual adverse effects.

As well as WRC, GNZL also applied and was granted permission from the Overseas Investment Office (OIO) to develop Phase 1: Western pit and haul road project. OIO granted permission subject to conditions. These conditions are summarised in Appendix 1b, and of direct relevance to this LMP, Condition 1.3 requires that 6.5 ha of indigenous forest remnants are covenanted (or equivalent, e.g., become scheduled Significant Natural Area under Waitomo District Plan) for permanent protection (Appendix 1b). Two such areas, and the rehabilitated area between them, are large enough and intact enough to make ideal candidates to receive lizards salvaged from the footprint (see Section 8).

Assumptions

DOC National Threat classification for Lizards in New Zealand

The effects assessment and 'mitigation package' presented in this LMP (Sections 7 & 8) assumes copper skinks have the national threat classification of 'Not Threatened' and ornate skink are 'At Risk - Declining' (Hitchmough *et al.* 2021¹¹).

Pakeho Pit

In this LMP, all references to 'Pakeho pit' are synonymous with 'Western pit and haul road'.

LMP site v Phase 1 western pit and haul road project footprint

In this LMP, all references to 'LMP site' are synonymous with 'Phase 1: western pit and haul road project footprint'.

Remediation versus Rehabilitation

In this LMP, the terms rehabilitation and remediation are used interchangeably and have the usual ecological meaning.

¹⁰ <https://www.doc.govt.nz/globalassets/documents/about-doc/concessions-and-permits/wildlife-research-permits/lizard-salvage-and-transfer-nz.pdf>

¹¹ Hitchmough *et al.* 2021. Conservation status of New Zealand reptiles, 2021. New Zealand Threat Classification Series 35. Department of Conservation, Wellington. 15 p.

4. Existing/Receiving Environment

Ecological Context – Present & Historic Vegetation

The LMP site lies within Waitomo (ED), and the King Country Ecological Region (ER). Prior to Polynesian and European clearance, vegetation over the footprint would have been rimu/tawa-kamahi forest.¹² The ED has a long history of sheep and beef farming which led to clearance of indigenous vegetation (rather than logging). Mangaeo (*Litsea calicaris*) is considered relatively common in the ED, and remnant matai forest where it occurs, is an important feature to retain in the ED.¹³

The LMP site is now over 80 % pasture with the balance made up of small and generally weedy indigenous vegetation remnants and karst landforms. Stock incursion/browse and pugging is obvious in the understory vegetation of all remnants. The cave systems of the wider area contain subfossil remains that point to a rich historic biodiversity of the footprint, including multiple species of lizards and frogs, and tuatara.

Topography

The local terrain is dominated by undulating to rolling hills rising to around 200 m to 280 m above sea level ('asl'). Within the LMP site, the topography is an undulating, karst landform with exposed, steep (>25°) limestone bluffs and dolines (sinkholes). The dolines merge in places to create short valley systems. The LMP site is also 'pock marked' by karst features that include not only the dolines and sinkholes but also small limestone outcrops or 'tors', and – in places – scatterings of exposed regolith that striate the LMP site's slopes and contrast with its broad swathe of open grassland.¹⁴

Threatened Land Environments

The LMP site and surrounding GNZL land lies entirely within D2.3a – a Category 3 threatened land environments (20-30 % indigenous cover left; Figure 2). This category is considered 'At Risk' nationally and worthy of formal protection.¹⁵

¹² <https://iris.scinfo.org.nz/layer/48289-potential-vegetation-of-new-zealand/>

¹³ See: McEwen, M. 1987. Ecological Regions and districts of New Zealand. Department of Conservation, Wellington, New Zealand June 1987.

¹⁴ Pakeho Pit Project Landscape Effects Assessment (Final). August 2022. Brown NZ Ltd.

¹⁵ https://ourenvironment.scinfo.org.nz/maps-and-tools/app/Habitats/lenz_tec

Pest Animals¹⁶

Two trail cameras were deployed in 2021 during the WSP lizard survey of indigenous vegetation remnants (see Section 6). Cameras revealed the presence of fallow deer (*Dama dama*), possums (*Trichosurus vulpecula*) and rats (*Rattus* spp.) up trees, as well as a pheasant (*Phasianus colchicus torquatus*). During the 12 hours of nocturnal spotlighting for lizards across three nights in 2021, a high number of possums were observed in all the indigenous vegetation remnants throughout the site. Several mammalian pests were also observed throughout the same field surveys during the day: two hares (*Lepus europaeus*), two hedgehogs (*Erinaceus europaeus*) within rank grass near indigenous vegetation remnants, a rabbit and a possum. A possible stoat (*Mustela erminea*) was also observed within an indigenous vegetation area.

Given the habitat and rural setting of the site, a range of other pest animal species are expected to be present over the footprint including mice (*Mus musculus*), domestic/feral cats (*Felis catus*), deer (*Cervus* sp.) and goats (*Capra aegagrus hircus*). Feral pigs (*Sus scrofa*) have not been recorded onsite but are appropriately recognised as lizard predators by GNZL.

Existing Draft Management Plans

As noted in Section 3, the LMP site is subject to many management plans of which the LMP is only one. Implementation of other management plans may yield incidental positive benefits to lizards and for this reason any relevant actions within these plans are referenced in this LMP (see Section 8 ‘Additionality’).

However, given these plans/actions have not been primarily developed as lizard-management tools and cannot, therefore, be considered ‘additional’; they are afforded no weight in my residual effects assessment (Section 8 ‘Anticipated Residual Effects’ and Table 6). Moreover, these plans are still in early draft with microdetail still under consideration. That said, firm agreements have been made, for example, regarding predator management, that are required to conform to resource consent conditions (Appendix 1a).

¹⁶ Terrestrial Ecological Impact Assessment report: Pakeho Pit, Graymont Quarry” was prepared by Ecology New Zealand Ltd and is dated 22 September 2022.

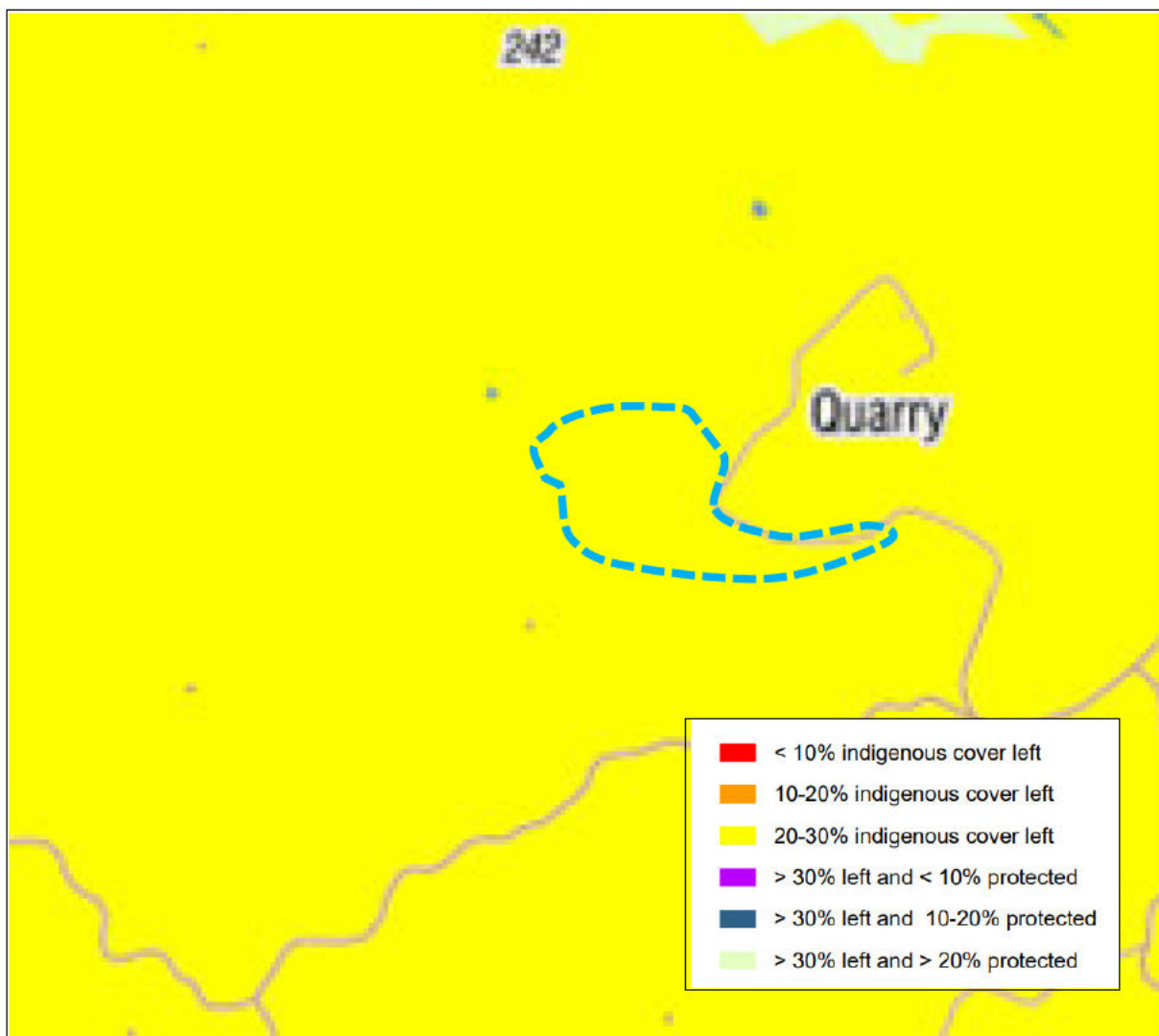


Figure 2: Threatened environment classification level IV (2012) category 3 (yellow) in and around the 26-ha LMP site (blue dotted edged polygon; indicative only).
https://ourenvironment.scinfo.org.nz/maps-and-tools/app/Habitats/lenz_tec

5. Proposed Works

The maximum footprint of the LMP site is 26 ha¹⁷; this area takes in all quarrying areas, haul roads, sediment detention ponds, laydowns, waste facilities, waste rock stacks, office buildings, fixed plant, workshop areas and overburden storage, some of which will take place over the existing Opārure Quarry footprint (Figure 3). However, the area of virgin ground and lizard habitats affected by the western pit and the haul road project is smaller at ca. 16 ha, the majority of which is pasture (Figure 3).

¹⁷ Page 8 of the Ecology Effects Assessment Terrestrial Ecological Impact Assessment report: Pakeho Pit, Graymont Quarry that was prepared by Ecology New Zealand Ltd that is dated 22 September 2022.

Works over the 26-ha LMP site will involve the complete removal of all vegetation, topsoil soil and karst features from virgin ground. Phase 1 works is estimated to take 10 years to complete.

Timing of Works

The western pit and haul road project is set to commence the moment this LMP is permitted by DOC. This is because conditions set down by the Overseas Investment Office require that quarrying activity must begin over the LMP site as soon as possible and before 2027.



Figure 3: Phase 1: Western pit and haul road project footprint (26-ha; orange-shaded polygon; indicative only) that includes existing plant of the Opāpū Quarry Quarry and 24-ha of virgin ground, predominately pasture.

6. Lizard Values of the Western Pit and Haul Road

Desktop Assessment of Indigenous Lizard Species

Very few recent lizard records occur within 10 km of the site (Figure 4). A copper skink was recorded 6.3 km northeast of the western pit in 1968 (Figure 3) but other than this record, the past herpetofauna of the area have been described from the subfossil record. This situation is almost certainly a symptom of lack of survey effort rather than a true absence of lizards (e.g., see survey results below).

Table 1 provides a summary of lizard records from bone fragments found in the caves shown in Figure 4, and of species recorded in similar habitats of Waikato that could have once occupied the

western pit and haul road project footprint. Of note, cave detections do not include either copper skink or ornate skink which, in my opinion, brings into question to accuracy of skink identifications from bone fragments.

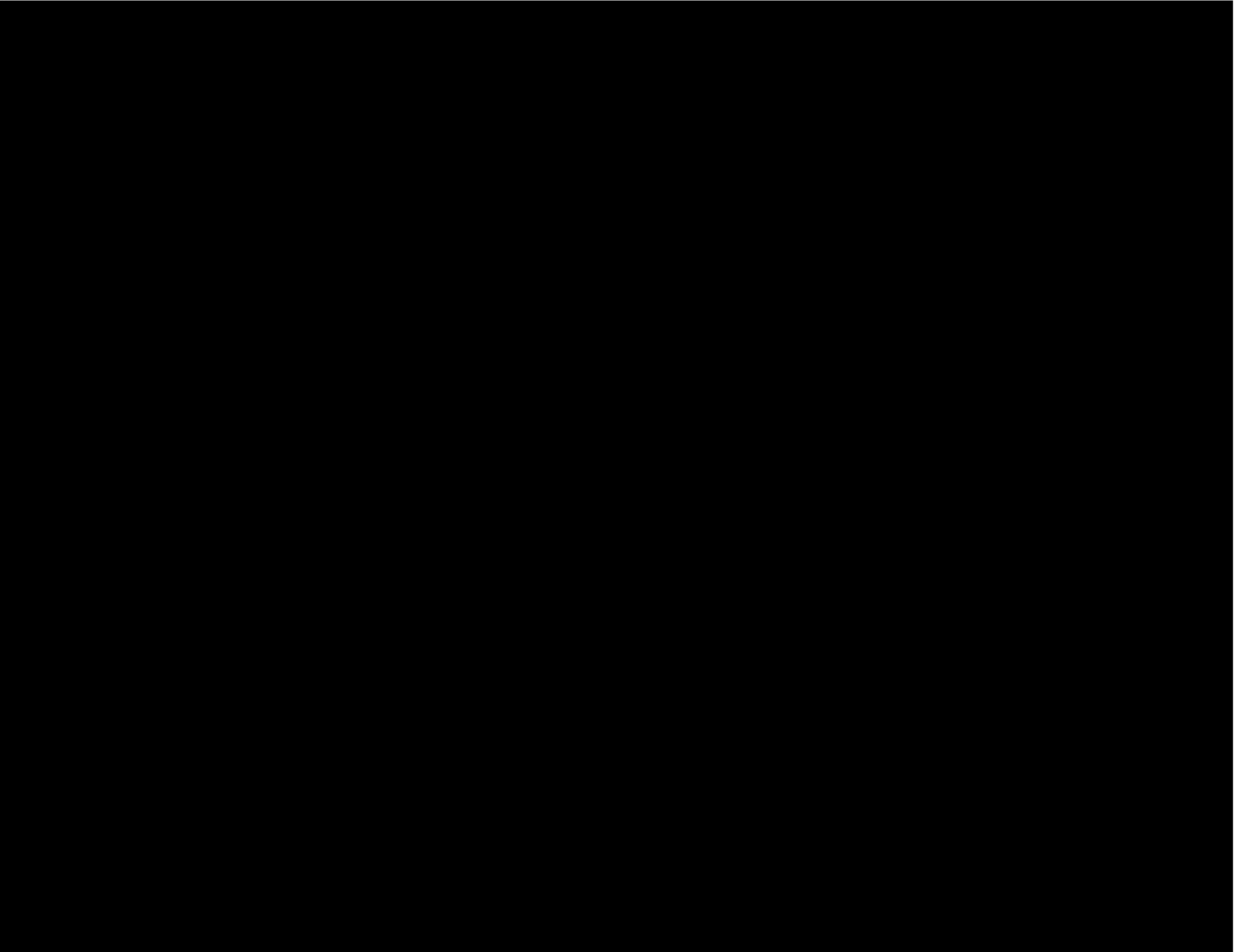


Figure 4: Location of caves near the Phase 1: Western pit and haul road project footprint (orange edged polygon; indicative only) that have recorded five lizard species now extinct from the area (green dots). The western pit is shown by red lines. The copper skink detection 6.3 km northeast of the footprint is also shown (orange dot) but otherwise no lizard records are known from the area.

Apart from the two species detected in lizard surveys, it is unlikely any other indigenous lizard species persist over the Phase 1 footprint (Table 1). I base this assessment on the depleted nature of indigenous vegetation and lizard habitats of the Phase 1 footprint, evident from aerial imagery (Figure 3) and survey results (also see my commentary below on lizard populations and habitats).

Table 1: Summary of indigenous lizard records recorded from caves within 10 km of the LMP site and of lizards likely to have once been present over the footprint (based on past and present habitats). I also provide my assessment of likelihood these species remain over the footprint. Cave records were obtained from the DOC Herpetofauna database downloaded September 2024. *Hitchmough et al. 2021. **Identified from bone fragments found in caves meaning the accuracy of identification of these species is questionable.

Common Name	Scientific Name	National Conservation status *	Likelihood of occurrence over the LMP site
Ornate skink	<i>Oligosoma ornatum</i>	At Risk – Declining	Present
Copper skink	<i>Oligosoma aeneum</i>	Not Threatened	Present
Northern grass skink	<i>Oligosoma polychroma</i>	Not Threatened	Low
Pacific gecko	<i>Dactylocnemis pacificus</i>	Not Threatened	Low
Raukawa gecko	<i>Woodworthia maculata</i>	Not Threatened	Low
Crenulate skink	<i>Oligosoma robinsoni</i>	At Risk - Declining	Low
Elegant gecko	<i>Naultinus elegans</i>	At Risk – Declining	Low
Forest gecko	<i>Mokopiriakau granulatus</i>	At Risk – Declining	Low
Robust skink**	<i>Oligosoma alani</i>	At Risk – Recovering	Very Low
MacGregors skink**	<i>Oligosoma macgregori</i>	At Risk – Recovering	Very Low
Whitakers skink**	<i>Oligosoma whitakeri</i>	Threatened - Nationally Endangered	Very Low
Tuatara**	<i>Sphenodon punctatus</i>	At Risk - Relict	Very Low
Duvaucels gecko**	<i>Hoplodactylus</i>	At Risk - Relict	Very Low

Lizard Surveys

Ecology NZ Lizard Survey – 2019

1) Survey Methods

Ecology NZ carried out a 4-day lizard survey over 4-7th November 2019 that included the entire western pit area, including the Phase 1 footprint (Figures 1 & 3). The Ecology NZ lizard survey used manual habitat searches, Visual Encounter Surveys (VES), the use of artificial cover objects (ACOs), gee's minnow trapping and nocturnal spotlighting (Table 2). The location of searches and lizard detecting equipment is shown in Appendix 2. The survey involved manual habitat searches (lifting logs, loose rocks, and other debris) for skinks

and geckos. VES consisted of scanning habitats for basking or foraging lizards from a distance using binoculars. These methods were carried out during good weather when lizards are more likely to be active (sunshine or partly cloudy, no precipitation, warm temperatures, light breezes). A total of 8 person-hours was spent undertaking diurnal manual habitat searches (Table 2).

Table 2: A summary of lizard survey effort carried out over the western pit and haul road project footprint including the Phase 1 project area (LMP site).

Surveyors	Location	Dates	Methods	Effort
Ecology NZ	Western pit and haul road	November 2019	Manual hand searches/ VES	8 person hours
Ecology NZ	Western pit and haul road	4-7 November 2019	ACOs – single layer	80 stations deployed for 4 weeks ahead of checks
Ecology NZ	Western pit and haul road	4-7 November	Gees minnow trapping	69 trap nights
Ecology NZ	Western pit and haul road	4-7 November	Nocturnal spotlighting	12 person hours
WSP	Western pit and haul road & proposed covenant areas	22-26 November 2021	Manual hand searches/ VES	26 person hours
WSP	Western pit and haul road & proposed covenant areas	22-24 November 2021	Nocturnal spotlighting	12 person hours

A total of 80 ACO stations were also installed across the entire western pit focussing on the large rock outcrops where lizards were likely to be attracted to the warmth and refuge of the ACOs (Appendix 2). Ten of these were placed within the Phase 1 footprint/LMP site (Appendix 2). The ACOs were left for four weeks¹⁸ to allow naturalisation and lizards to become accustomed to them. The ACOs were then checked four times over four consecutive days (4th-7th November 2019) (Appendix 2). A total of 23 baited gee-minnow traps were placed around rock formations occurring throughout the site during ACO checks; five of these were placed within the LMP site (Appendix 2). These traps were baited with fruit and set over three consecutive

¹⁸ Best practice is 3-months ahead of checks.

nights from the 4th-7th November 2019 (23 x 3 trap nights; Table 2). All gee's minnow traps were checked and rebaited daily.

A total of 12 person-hours of nocturnal spotlighting was conducted. The spotlighting occurred over three nights, primarily focusing on arboreal lizard habitat along forest edges and potential terrestrial gecko microhabitats within rock formations. Nocturnal spotlighting involved scanning of potential gecko habitat with high-powered head torches and binoculars during favourable conditions for gecko activity (warm weather and no rain or strong winds).

WSP Lizard Survey -November 2021

1) Survey Methods- WSP

WSP ecologists¹⁹ carried out systematic manual hand searches, VES and nocturnal spotlighting for native lizards in November 2021 over the western pit including Phase 1 footprint, and outside the footprint in the vicinity of the proposed covenants. The weather over the survey period from the 22nd to the 25th of November was warm, mainly sunny with cloudy periods and light winds providing suitable conditions for both nocturnal and diurnal surveys (Table 3).

Table 3: Weather conditions encountered over the WSP lizard survey.

Date	Maximum Air Temperature (°C)	Notes
22/2/21	26	overcast, light wind
23/2/21	27	mainly sunny with some cloudy periods, light wind
24/2/21	26	Sunny, light wind
25/2/21	26	Mainly Sunny, light wind

Systematic manual hand searches focused on searching the highest quality habitat throughout the site i.e., rocks and rotting wood/logs and areas where copper skinks had not been previously observed in the 2019 surveys carried out by Ecology NZ (see Appendix 2 that shows where skinks were detected by Ecology NZL). Visual encounter surveys involved scanning areas of bare karst from a distance (with and without binoculars) for basking or foraging arboreal lizards. A total of 26 person hours of systematic manual hand searches and VES was carried out (Table 2).

A total of just over 12 person hours of nocturnal spotlighting was also carried out over three nights from the 22nd to the 24th of November

¹⁹

2021 (Table 2). The spotlighting focused on arboreal lizards and frog species within the main indigenous vegetation fragments throughout the western pit, including the Phase 1 footprint and proposed covenant areas. Nocturnal searches also included scanning open karst formations for active lizards. The weather conditions during night searches were relatively stable with some light wind and no precipitation, one night was completely clear and the other two nights had overcast conditions.

Lizard Survey Results – Lizard Populations

Manual searches across the project area and ACO checks confirmed the presence of a copper skink population (*Oligosoma aeneum*; Figure 5) over the Phase 1 footprint (Figure 7a). A single ornate skink (*O. ornatum*; Figure 6) was also detected right within the Phase 1 footprint (Figure 7b); Ornate skinks are, therefore, assumed to be present over the Phase 1 footprint but at very low densities. Ornate skinks are bigger bodied skinks when compared to copper skinks and tend to be more habitat restricted as a result. This in part may explain their relative rarity over the Phase 1 footprint that has little by way of cover²⁰ (Figure 7b).

Over both surveys combined a total of 74²¹ copper skinks were detected over the western pit through manual hand searches (the majority from under logs and under rocks surrounded by rank grass) and one copper skink was found beneath an ACO (Figure 7a). Of these, 25 were detected over the Phase 1 footprint (Figures 7b). The copper skink population over the western pit and haul road site is considered relatively numerous for a Waikato site and unusual in that they favored large limestone rocks as shelter (M. Yungnickel pers. comm. October 2024).

Captured copper skinks included pregnant females and juveniles indicating a healthy population exists over the footprint. Of note, the ornate skink was a gravid female meaning at least one other skink is present over the western pit and possibly within the Phase 1 footprint.

²⁰ Ornate skinks are also slower to reach sexual maturity and this in tandem with a greater habitat specificity makes them more vulnerable to local extinction in pastoral settings. Ornate skinks are not commonly encountered over Waikato.

²¹ Suspected copper skinks and skinks that were unable to be identified are assumed in this LMP to be copper skinks given the relative rarity of ornate skinks at over the western pit.

No lizards were captured in gee's minnow traps. Nocturnal spotlighting, carried out over both lizard surveys, did not detect arboreal lizards despite degraded habitat for forest geckos occurring in the discrete patches of indigenous vegetation over the Phase 1/LMP site. Georeferenced locations of all lizards detected through survey are provided in Appendix 3.



Figure 5: A copper skink, *Oligosoma aeneum* captured over the western pit, November 2019. Photo: Ecology NZL.



Figure 6: Ornate skink, *Oligosoma ornatum* captured under a log over the western pit and haul road project footprint, November 2021. Photo: WSP.

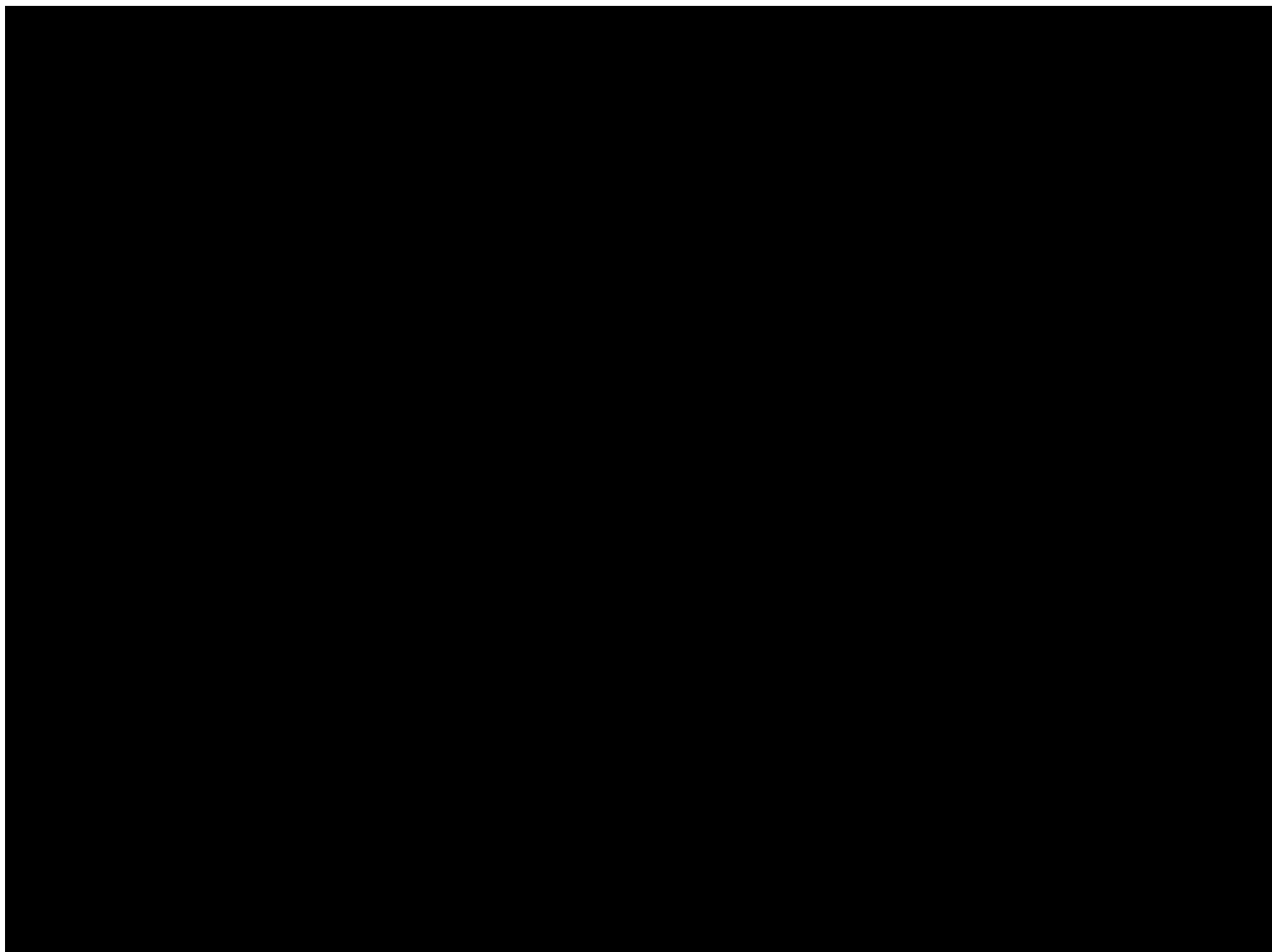


Figure 7a: Lizard detections collated from both lizard surveys across the western pit (red edged polygon) that includes the Phase 1 footprint (orange edged polygon; indicative only). Yellow dots=copper skink and blue dot=ornate skink.

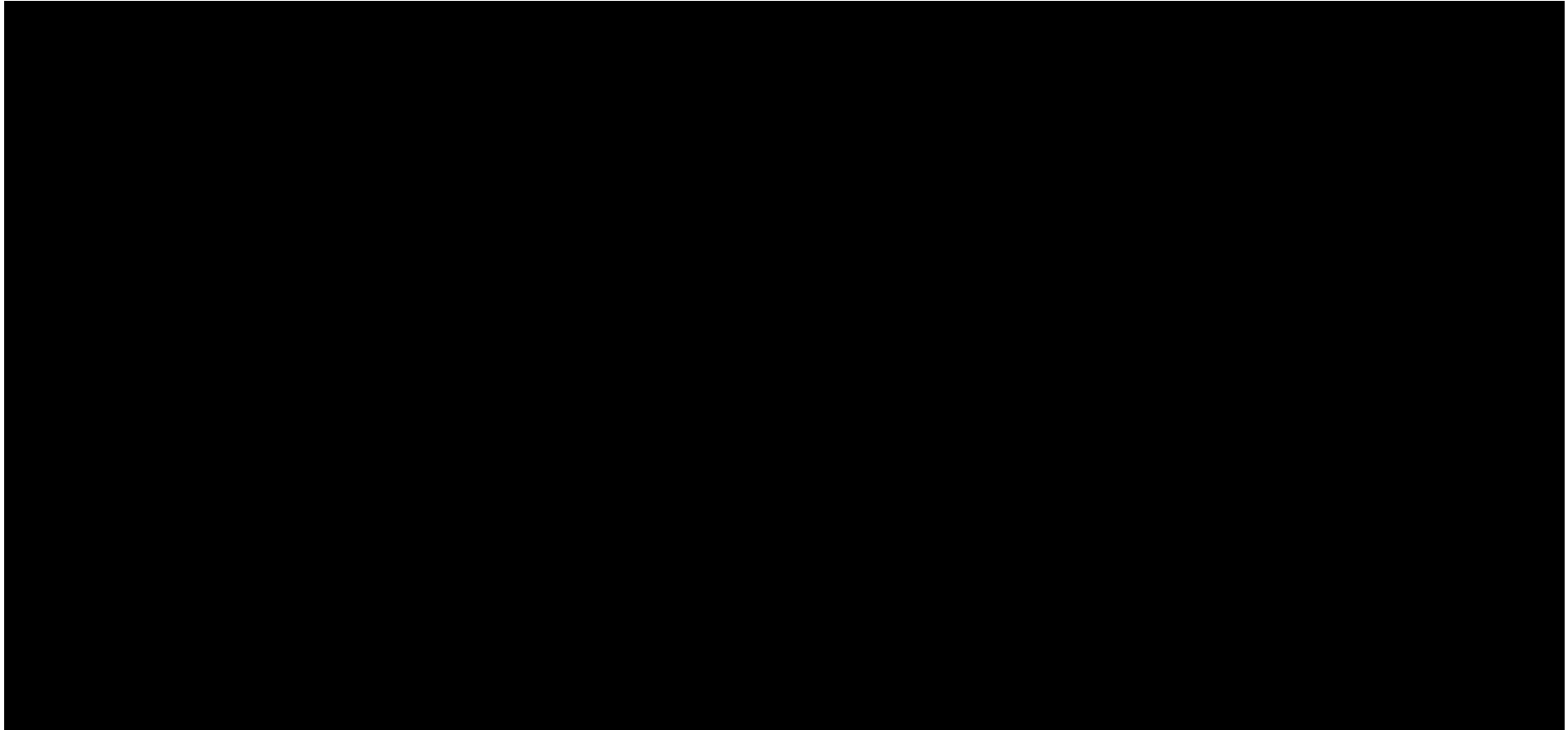


Figure 7b: Lizard detections across the Phase 1 footprint (orange edged polygon). Lizard records were collated from both lizard surveys detailed above. Yellow dots=copper skink and blue dot=ornate skink. Red lines indicate the edge of the western pit.

The exotic plague skink (*Lampropholis delicata*) was also present over the western pit including the Phase 1 footprint. This species is an “unwanted organism”²² in New Zealand and won't be mentioned again in this LMP, nor will it be salvaged.

Lizard Survey Results – Lizard Habitats

Much of the Phase 1 footprint is grazed pasture (ca. 88.6 %; see Appendix 4 for mapped vegetation over the western pit). Grazed pasture, except where rocks or logs occur, offers no cover for lizards (Figure 8).



Figure 8: Large, isolated log of the western pit under which a copper skink was found in 2019.

An estimated 2.1 % of the Phase 1 footprint is made up of indigenous vegetation remnants (Appendix 4), almost all of which that have a woody weed burden and the understory shows signs of a heavy impact from stock. Remnant native trees and shrubs (e.g., taraire, mapou and pigeonwood) are generally found within gullies, on some steeper slopes and within depressions across the footprint. These

²² <https://www.doc.govt.nz/nature/pests-and-threats/animal-pests-and-threats/plague-skinks/#:~:text=DOC%20has%20worked%20closely%20with,explicit%20permission%20of%20MPI%20Biosecurity.>

remnants are relatively small when compared to surrounding indigenous vegetation remnants that will be ultimately permanently protected by covenanting under the “Ecological Betterment Plan” (see Section 8).

Willows and other exotics are interspersed within both the pasture and native remnants found across the Phase 1 footprint (see Figure 9). Decomposing logs, rocks, clumping vegetation and leaf litter in and around the edge of these blocks provide lizard habitat.

The remainder of the Phase 1 footprint or *ca.* 9.3 %, is cloaked with karst ecosystems (Figure 10). Where karst areas have associated rockfall areas with loose and scattered rocks, lizards were able to persist. Karst landforms were also suitable habitat for ground-dwelling geckos, such as Raukawa gecko (e.g., Figure 10), but this species was not recorded during surveys. Potential habitat for arboreal geckos was also noted on-site within the scattered native dominated indigenous vegetation remnants (Figure 11). These blocks were, however, isolated from any other large tracts of indigenous vegetation which may restrict their utilisation by arboreal gecko species. Moreover, very few of these remnants had an intact canopy over the Phase 1 footprint.

An assessment of lizard habitats of the entire western pit was provided in the AEE.²³ Lizard habitats were described as of “moderate” value on page 47 of the AEE. This assessment included both actual habitats, i.e., that found to support copper skinks and a low-density ornate skink population; as well as potential habitat for Raukawa gecko, such as the limestone rock formations/karst features where no lizards were found (e.g., Figure 10).

²³ “Terrestrial Ecological Impact Assessment report: Pakeho Pit, Graymont Quarry” was prepared by Ecology New Zealand Ltd and is dated 22 September 2022.

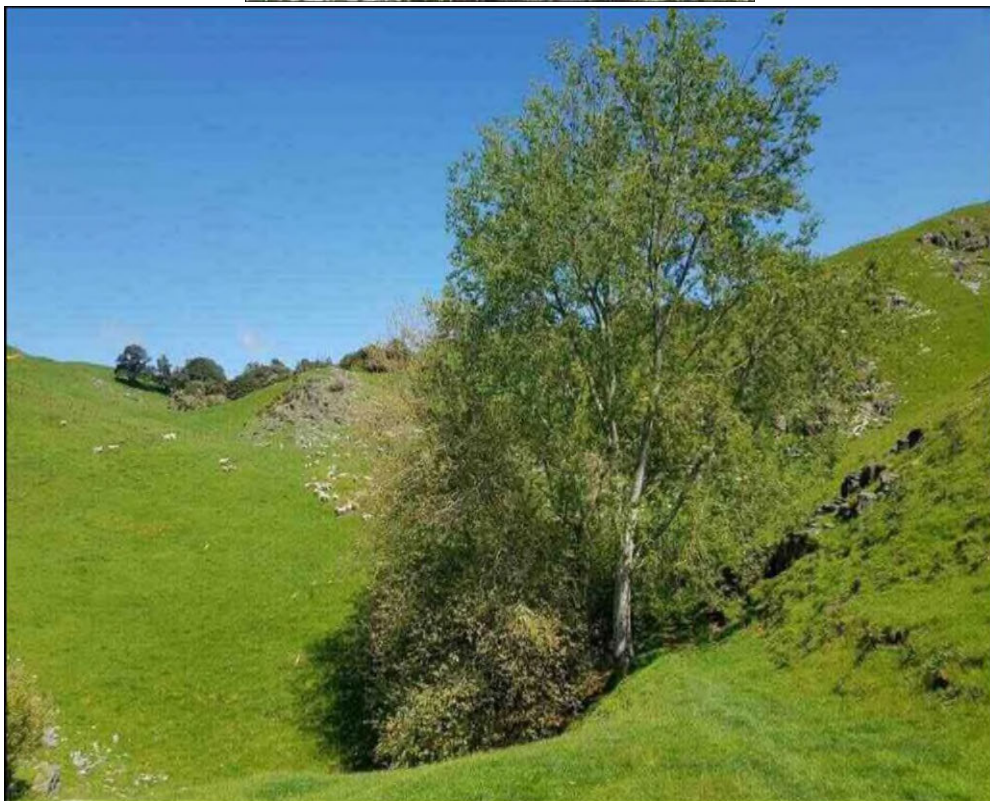
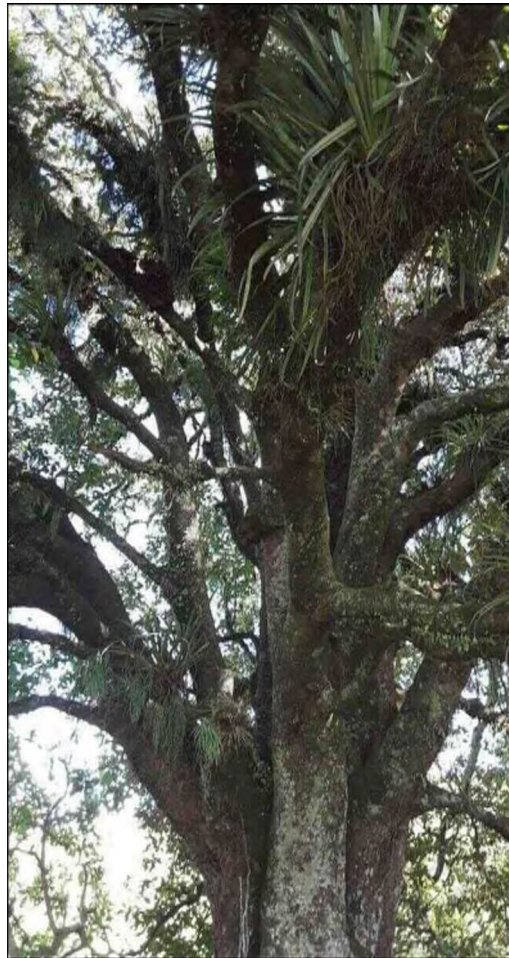


Figure 9: Upper: Example of a large indigenous tree found within an indigenous vegetation remnant over the western pit that could provide habitat for forest gecko. Lower: Large poplar near the bottom of a weedy gully.



Figure 10: Rock structures typical of the western pit with numerous crevices, providing potentially suitable habitat for lizards such as Raukawa gecko.



Figure 11: Representative photos of indigenous vegetation remnants with rock over the Phase 1: western pit and haul road project footprint.

Quantitative Assessment of Lizard Values Affected

Although subjective and subject to much uncertainty, it is my assessment that at most 2 % (0.52 ha) of the Phase 1: western pit and haul road project footprint provides shared habitat for copper skink and ornate skink (Table 4). For the rarer and apparently more habitat-restricted ornate skink, this estimate is very conservative. I base this 2 % estimate on the following:

- Most of the footprint is pasture (ca. 88.6 % or ca. 23 ha, which does not provide lizard for lizards. Occasional logs and rocks are the exception to this, e.g., Figure 8).
- Karst features cover 9.3 % of the site (2.42 ha), and copper skinks tended to be found under loose slabs associated with rocky ribs/outcropping in rank grass (Figure 7).
- Parts of the site are cloaked in remnant indigenous vegetation (2.1 % or 0.55 ha). Of this, only 2 % (or 0.011 ha) has an intact canopy and has understory vegetation has been heavily impacted on by stock access.²⁴ Some skinks were found on the edge of vegetated areas under decomposing logs.
- My appraisal of site photographs and aerial imagery of the Phase 1 project footprint that shows potential lizard habitat is sparse over much of the footprint (see Figure 7b).
- The paucity of lizard records over the wider area from DOC Herpetofauna database is consistent with a long history of pastoral practices over the Phase 1 project footprint and wider Graymont NZL land holdings.
- The zero captures of copper skinks in gee's minnows and only 1 skink captured under the ACOs deployed during survey over the entire western footprint (Appendix 2).
- Approximately 2 ha of the footprint is already developed (plant/offices and parking at the Opārure Quarry).

Based on the estimated area of copper skink habitat affected (≤ 0.52 ha; Table 4), I estimate ≤ 150 copper skink individuals will be affected by the development of the Phase 1 western pit and haul road project footprint (Figure 7b). This estimate is based on how many skinks I believe, through experience, could be encountered by trapping and hand searching over 0.52 ha of degraded habitat in a pastoral

²⁴ Page 46 of the "Terrestrial Ecological Impact Assessment report: Pakeho Pit, Graymont Quarry" was prepared by Ecology New Zealand Ltd and is dated 22 September 2022.

setting.

Table 4: Assessment of potential lizard values affected over the 26-ha Phase 1: western pit and haul road project footprint.

Lizard Species Affected	Estimate of Habitat Affected (ha)	Estimate of Individuals Affected	Habitat Quality Affected
Copper skink	≤ 0.52	≤ 150	Low
Ornate skink	<0.52	≤ 10	Low

For ornate skink individuals affected, I have used survey detection over the entire western pit as a guide, i.e., 1 ornate skink was detected for every 74 copper skinks. I have, therefore, used this ratio to guide my determination that ≤10 ornate skinks could be affected over the 26-ha footprint (Table 4).

Significance of Lizard Habitats of 'Phase 1 Western pit and haul road project footprint'

Given the Phase 1 project footprint provides probable habitat for the At Risk – Declining ornate skink (see Figure 7b), small areas (estimated here at 2 % or 0.52 ha; Table 4) of the Phase 1 footprint are likely significant under the Section 6 (c) RMA (1991) significance criteria in Appendix 5 of the Waikato Regional Policy Statement, 2016²⁵. More specifically, the probable presence of ornate skink triggers criterion 3 of the WRC RPS that relates to the national conservation status of fauna.²⁶

7. Effects Assessment (pre-mitigation package)

Overview

Adverse effects, as detailed here (Table 5) and enumerated in Table 4 are expected should no avoidance, remediation or mitigation actions be carried out (but see Section 8). For adverse effects, a mix of actual and potential effects are included in this Section of the LMP (Table 5). These effects, and the significance of effects in Table 5 are consistent with these reported in the AEE for the entire western pit.²⁷

²⁵ Ornate skink habitat also meets the criteria to be an SNA under the NPS-IB.

²⁶ Hitchmough *et al.* 2021. Conservation status of New Zealand reptiles, 2021. New Zealand Threat Classification Series 35. Department of Conservation, Wellington. 15 p.

²⁷ "Terrestrial Ecological Impact Assessment report: Pakeho Pit, Graymont Quarry" was prepared by Ecology New Zealand Ltd and is dated 22 September 2022.

Developing the 26-ha Phase 1 project footprint/LMP site has the potential to adversely impact on resident lizards and their habitats through a combination of short-term effects (e.g., death/injury and displacement through up to 10 years of physical works to develop the Phase 1 project footprint; see Section 4); and long-term effects that may result in the deterioration of lizard populations and habitats at a wider scale, i.e., over Graymont NZL land holdings through population & habitat fragmentation.

*Table 5: Summary of effects and level/significance of effect for lizard species & habitats affected by development of the 26-ha Phase 1: western pit and haul road project footprint. *Values shown in Table 4 of this LMP and associated text. **Indicates potential effects.*

Values Affected*	Type of Effect	Effect	Level of Significance of Effect (Local)	Level of Significance of Effect (National)
<i>Copper skink</i> ≤ 150 individuals over ≤ 0.52 ha of shared habitat; 1 population	Adverse	Injury/Death	Moderate	Low
	Adverse	Displacement/ Disturbance of populations in areas adjoining the footprint and active works areas	Low	Low
	Adverse	Permanent loss of all habitats	Moderate	Low
	Adverse	Fragmentation of populations & habitat over GNZL land**	Moderate	Low
<i>ornate skink</i> ≤ 10 individuals over < 0.52 ha of shared habitat; 1 population	Adverse	Injury/Death	High	Low
	Adverse	Displacement/ Disturbance of populations in areas adjoining the footprint and active works areas	Low	Low
	Adverse	Permanent loss of all habitats	High	Low
	Adverse	Fragmentation of population & habitat over GNZL land**	High	Low

Geographic Area of Assessment

For this effects assessment, the geographic scale for 'local' significance of effect is the ca. 415-ha area taken in by Graymont NZL land holdings (Figure 1).

Definition of Impact Area

The so-called 'point of impact' for this assessment is the 26-ha LMP site/Phase 1: western pit and haul road project footprint (Figure 1).

Definition of Effect

Effect is not defined under the Wildlife Act (1953), or indeed the Conservation Act (1987). For this LMP, therefore, 'effect' takes the broad definition provided in Section 3 of the RMA (1991) (see Appendix 5).

Local/National Level/Significance of Effect -RMA (1991)

The RMA (1991) provides no guidance on how to assess the level/significance of effect. In making my assessment of significance of effect at the local scale (see Table 5), I consider national and regional threat classifications and my knowledge of the life history of both lizard species affected.

Significance of effect at the local level also considers my estimates of number of individuals and extent of habitat affected (Table 4) and the risk of the local populations being driven to extinction (or driven to the point where random events may result in local extinction) should the effect be left unaddressed by the 'mitigation package' offered in Section 8. My assessment at the national level mimics my considerations at the local level but I expand considerations to the national scale.

Significance of Effects – Wildlife Act (1953)

Under the Wildlife Act (1953) all indigenous New Zealand lizards are absolutely protected and, therefore, all effects on indigenous lizards and their habitats are considered significant (as per the DOC 'Guidelines and model for producing management plans for New Zealand lizards').²⁸

²⁸ <https://www.doc.govt.nz/contentassets/02b1a908bcb34ff1a37652ad357d3e2c/lizard-management-plan-template.pdf>

8. Mitigation Package

Overview

In applying for resource consent from WRC²⁹, GNZL has offered an LMP condition (see Appendix 1a). The higher-level plan under which the LMP is positioned is the “New Pit & Haul Road Site Management Plan” that has the objective to “*avoid, remedy, manage or offset the identified environmental effects of the Proposal*” (proffered Condition 16; Appendix 1a). The ‘Mitigation Package’ detailed in this Section of the LMP, therefore, addresses this high-level objective.³⁰

The Mitigation Package is weighted heavily towards mitigation (salvage) of adverse effects. Scope to avoid adverse effects is extremely limited due to the nature of the development (see Section 5 ‘Proposed Works’) and remediation of the Phase 1 footprint will not occur until at least half the western pit is developed (up to 50 years into the future). For this reason, rehabilitation of the LMP site will form an important component of future GNZL LMPs. No compensation is required to address residual effects as mitigation proposed will more than balance anticipated adverse effects, i.e., any residual effects will be negligible. In this LMP, all actions to support the lizard salvage regime are considered mitigation, e.g., permanently protecting the release site under the Waitomo District Plan by applying ‘SNA’ status to the site (or equivalent) and adjoining areas (see ‘Release Site – SNA status’ below).

Additionality

As noted elsewhere, the LMP site is subject to numerous management plans (listed in Condition 17b., Appendix 1a). Actions detailed in the mitigation package of this LMP are all additional and complementary to actions described on other management plans. When actions are discussed that are already in train under the Ecological Betterment Plan and its subordinate management plans, this is duly acknowledged. For additional clarity, examples that relate to the release site include:

²⁹ GNZL require resource consent from both Waitomo District and Waikato Regional Councils. No additional lizard-related conditions are expected under the Operative Waitomo District Plan.

³⁰ This LMP sits within the scope of the ‘Ecological Betterment Plan’ required by proffered Condition 17 for WRC consenting, i.e., Western Pit Ecological Betterment Plan. Draft, 2nd October 2024. Prepared by Pattle Delamore Partners Ltd.

1. Rehabilitation by planting indigenous plants to provide a vegetated link between the two adjacent gullies that are proposed SNAs (the ‘rehabilitated link area’; red area shown in Figure 12).³¹
2. Scheduling the two gullies as SNAs (or equivalent) under the Waitomo District Plan, but not the rehabilitated link area in between.
3. Pest control over the SNAs & rehabilitation link area. Pest control includes woody weeds and the entire suite of exotic lizard predators, except mice.
4. Fencing of SNAs and rehabilitated link area to exclude goats, pigs, deer and stock.³²

Additionalities unique to this LMP include:

1. Mice control over the 0.5 ha release area, and a 20 m buffer surrounding it into the wider rehabilitated link area (Figure 13). Monitoring of rodents, to determine the efficacy of this control, will be undertaken twice annually following DOC best practice (Figure 13). Monitoring will have the purpose of ³³
2. Combining the entire ca. 2.6 ha rehabilitated link area into a scheduled SNA (or equivalent), that takes in both gullies and the rehabilitated link area (ca. 10 ha). Larger forest remnants with a lower edge to core ratio are more viable over the longer term than smaller remnants.
3. Augmenting the rehabilitated link area with rock and logs under the guidance of the project herpetologist, to provide quality and enduring skink habitat to receive salvaged lizards.

³¹ Rehabilitation will be managed under a SNA Planting and Management Plan that is currently in prep. Plantings will be setback 3 m from lizard habitat patches shown in Figure 14.

³² See Section 8.3 Pest Plant and Animal Control, Appendix M of the AEE, “Terrestrial Ecological Impact Assessment report: Pakeho Pit, Graymont Quarry” was prepared by Ecology New Zealand Ltd and is dated 22 September 2022.

³³ <https://www.doc.govt.nz/Documents/science-and-technical/inventory-monitoring/im-toolbox-animal-pests-using-tracking-tunnels-to-monitor-rodents-and-mustelids.pdf>

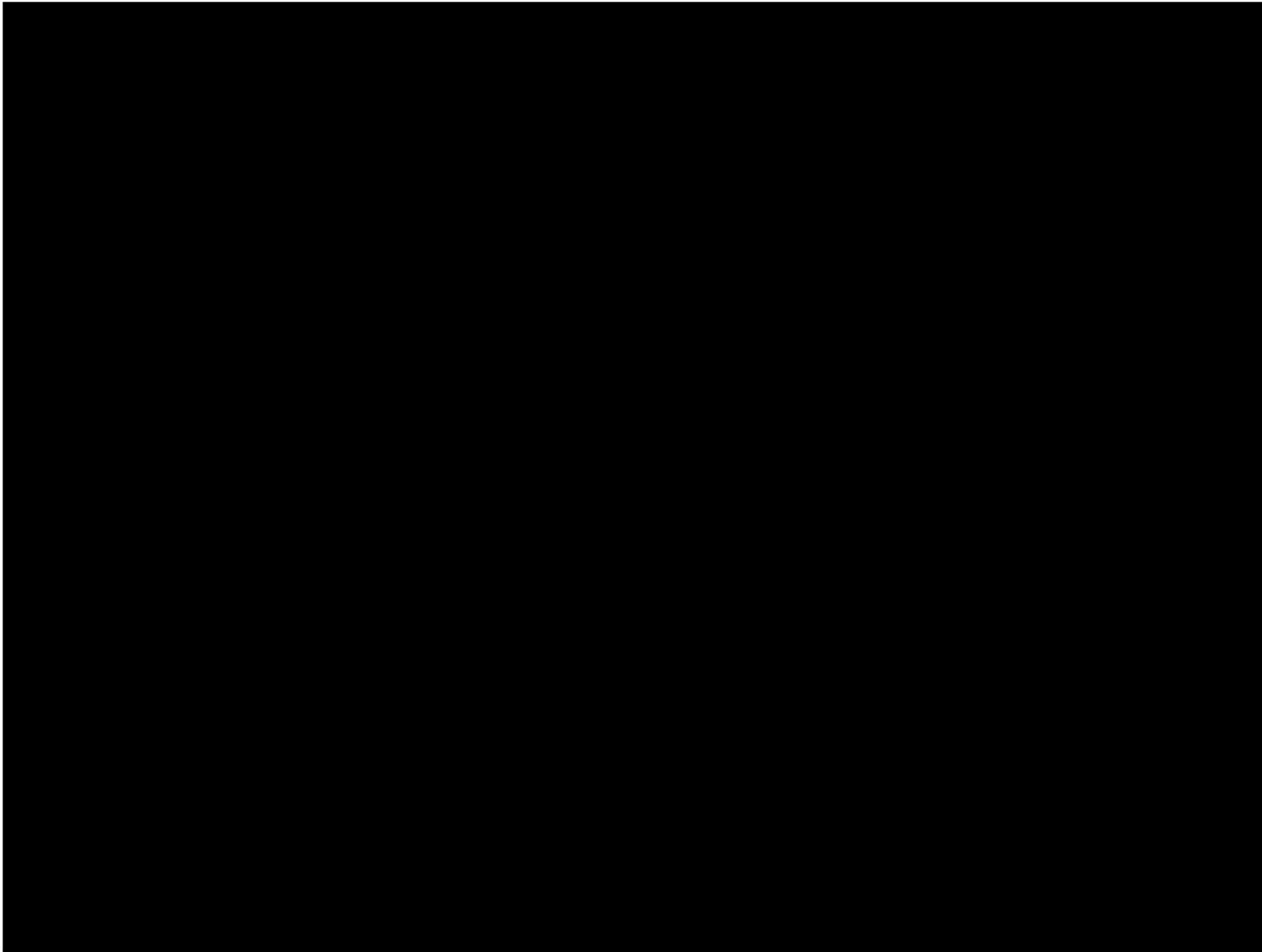


Figure 12: Location of ca. 2.6 ha rehabilitated link area (red shaded area) between the two gullies proposed to be SNAs (or equivalent). Phase 1 project area is shown by the orange edged polygon (indicative only). Note: A revised western pit extent is shown in Figure 1 of this LMP.

Avoidance Actions

Avoidance of adverse effects over the Phase 1 western pit project footprint is not possible given the complete loss of all lizard habitats will occur during works (Section 5 and Table 6).

Remediation/Rehabilitation Actions

Remediation of the Phase 1 western pit and haul road project footprint will not occur until at least half the western pit is developed (up to 50 years into the future). Over much of this time, the Phase 1 footprint will be an active development site. For this reason, rehabilitation of the Phase 1 project footprint is not possible within the timeframe of this LMP (Table 6).

Table 6: Summary of the 'Mitigation Package' relating to LMP site and the weighting attributed to each action in this LMP. This table informs the 'Anticipated residual effects assessment' of the LMP below.

Type of Action	Action	Weight given to balance anticipated loss of lizard values
Avoidance	• N/A	• N/A
Remediation/Rehabilitation	• N/A	• N/A
Mitigation	• Salvage of copper and ornate skinks from the 26-ha Phase 1 project footprint. Skinks will be released into rehabilitated habitat of the link area (Figure 12 & 13), on GNZL land	• High
Compensation	• nil	• nil

Mitigation Action - Lizard Salvage of Phase 1 project area (26-ha LMP site)

Overview of Salvage Regime

Mitigation under this LMP will involve a comprehensive salvage of copper and ornate skinks from the 26-ha Phase 1: Western pit project footprint, for release into an area adjacent to the LMP site, on GNZL land holdings (the 'release site'). The release site will be rehabilitated from existing pastureland to indigenous shrubland and then ultimately forest under the 'Ecological Betterment Plan'³⁴ that over the longer term will link two adjacent gully systems with existing

³⁴ Western Pit, Graymont Quarry Ecological Betterment Plan. Draft. October 2024. Pattle Delamore Partners Ltd.

indigenous forest remnants. The two gullies will each become a scheduled 'Significant Natural Area' (SNA, or equivalent) under the Waitomo District Plan, and under this LMP, the area linking the gullies will also be included in the SNA. The SNA (including the link) will be fenced to exclude pigs, deer and stock, and managed for the control of feral goats, feral deer, hedgehogs, feral cats, hares/rabbits, mustelids, mice, rats, feral pig, and possums³⁵. Under this LMP, mice will also be controlled over the release site (see 'Additionality' above).

Salvage Methods

As noted above, it is estimated that only 2 % of the Phase 1: Western pit and haul road project footprint contains lizard habitat so although Phase 1 salvage area is relatively large, at 26 ha, the majority (88.6 %) of the site is pasture and won't be subject to salvage (see Section 6). The exception to this is where pasture has rocky habitat or logs that offer cover for skinks. Over the Phase 1 area, I estimate up to 150 copper skinks and less than 10 ornate skinks could be salvaged over the estimated 0.52 ha of lizard habitat (Table 4).

Copper and ornate skinks will be salvaged using a combination of ACOs and gee's minnow traps, with hand searching carried out between trap checks.³⁶ Pitfall trapping (4 L pitfall traps) may also be used, at the discretion of the project herpetologist. Handsearching proved to be the most effective detection technique during surveys (see Section 6) and is expected to be the most effective capture method during salvage. Hand capturing involves lifting rocks and logs and then hand-catching lizards beneath, and where rock occurs in outcropping, systematically destructively searching the outcrops to extract any lizards within.

At least 100 baited gee's minnow traps will also be used across the salvage area, densely spaced. Gee's minnow traps will be moved during salvage to maximise captures. Lastly, up to 100 ACO stations

³⁵ GNZL have agreed to manage pests/predators for an initial five-year period, at the end of this period, pest animal and plant methodologies will be reviewed and revised to consider site conditions and to include any up-to-date best practice methodologies.

³⁶ Salvage methods need not be restricted to only these methods; for example, the project herpetologist may decide closed cell foam wraps could be useful to detect forest geckos. Under this LMP, the methods described here are considered the most appropriate to maximise lizard captures, but other methods could also be used, but as well as not in place of, methods described in this section.

(triple layers of Onduline™ at each station) will be deployed at least 3-months ahead of salvage to allow resident lizards to take up residence and then be captured during salvage. ACOs will be deployed in and around rocky habitat at sunny edges.

Salvage Effort

Salvage will continue for a minimum of 7 gees minnow trap days where weather is suitable for lizard activity (i.e., air temperatures above 12°C and below 25°C and generally sunny). After this time, if lizards are still being captured at ≥ 1 per day via any method; trapping, handsearching and ACO checks will continue until no lizards are found over one day where weather conditions allow lizard activity.

Salvage will not occur during the months of June-August inclusive, and no night salvage will take place. Salvage will be stalled if air temperatures exceed 25°C.

Lizard Handling & Release

During the salvage and release program, all lizard captures will be overseen by the project herpetologist. Captured lizards will be handled and held following best practice methodology and be released as soon as practicable into the release sites. Upon capture, each lizard will be placed inside an individual cloth bag and stored in a chilly bin (placed in the shade) until 'processing'. 'Processing' will include taking snout-vent length, vent-tail length, and recording sex/scars (data will inform a salvage report to DOC; see Section 11). No individual lizard will be kept for more than 8-hours before being released (unless weather is not suitable for release). If weather conditions deteriorate to the point where released lizards would be unable to move to find a safe retreat site, lizards will be slowly warmed in the hands of releaser, until they can perform a righting response when turned over.

Timing of Salvage

Salvaging lizards too far ahead of works allows any lizards not captured to potentially move into the construction area between the completion of salvage and commencement of works. For this reason, salvage for copper and ornate skinks will be carried out within 1 month of commencement of works over Phase 1 western pit and haul road project footprint. No measures will be put in place to stop lizards that are not salvaged, moving into the active works footprint.

Release Site- Overview

The 0.5 ha release site within the rehabilitated link area, shown in Figure 13, will be created specifically to receive salvaged lizards, and will be completed and signed off by the project herpetologist at least 1 month ahead of any salvage activity. **The creation of the release site is a key action in this LMP** and must be carried out under the direction of the project herpetologist.

The anticipated outcomes relating to the creation of lizard habitat patches within the rehabilitated link are fully aligned with the biodiversity objective in Part 19.3 of the Maniapoto Environmental Management Plan, and a related policy that seeks to ensure that *“biodiversity is maintained, restored, enhanced and protected throughout the Maniapoto rohe”*.

No lizards were found at the release site during surveys (see Figure 13), and the 0.5 ha release site is considered ‘empty habitat’. Research has shown that newcomers do not survive as well as already established resident lizards at a release site³⁷ and for this reason, releasing salvaged lizards into ‘empty’ habitat is preferable to releasing them into already occupied habitats.

Grazing will be removed from the release site by December 2024 meaning rank grass will be present to provide cover for skinks in and around the rock/log habitat patches whilst the indigenous plantings over the wider rehabilitated link area (ca. 2.6 ha; Figure 13) become established. In this way the initial release site will mimic lizard habitat of the LMP site (see Section 6), but over time will progressively improve through the planned pest and predator management over the site (see Condition 17b. in Appendix 1a) in combination with the planned rehabilitation plantings and fencing to exclude goats, deer, pigs and stock (see ‘Additionality’ above). Given lizards’ role in seed dispersal³⁸, lizards have the potential to improve long-term outcomes for indigenous plantings of the rehabilitated link area.

³⁷ Norbury, G., van den Munckhof, M., Neitzel, S., Hutcheon, A., Reardon, J., & Ludwig, K. (2014). Impacts of invasive house mice on post-release survival of translocated lizards. *New Zealand Journal of Ecology*, 322-327.

³⁸ Tocher, M. D. (2003). The diet of grand skinks (*Oligosoma grande*) and Otago skinks (*O. ottagense*) in Otago seral tussock grasslands. *New Zealand Journal of Zoology*, 30(3), 243-257. Wotton, D. M., Drake, D. R., Powlesland, R. G., & Ladley, J. J. (2016). The role of lizards as seed dispersers in New Zealand. *Journal of the Royal Society of New Zealand*, 46(1), 40-65.

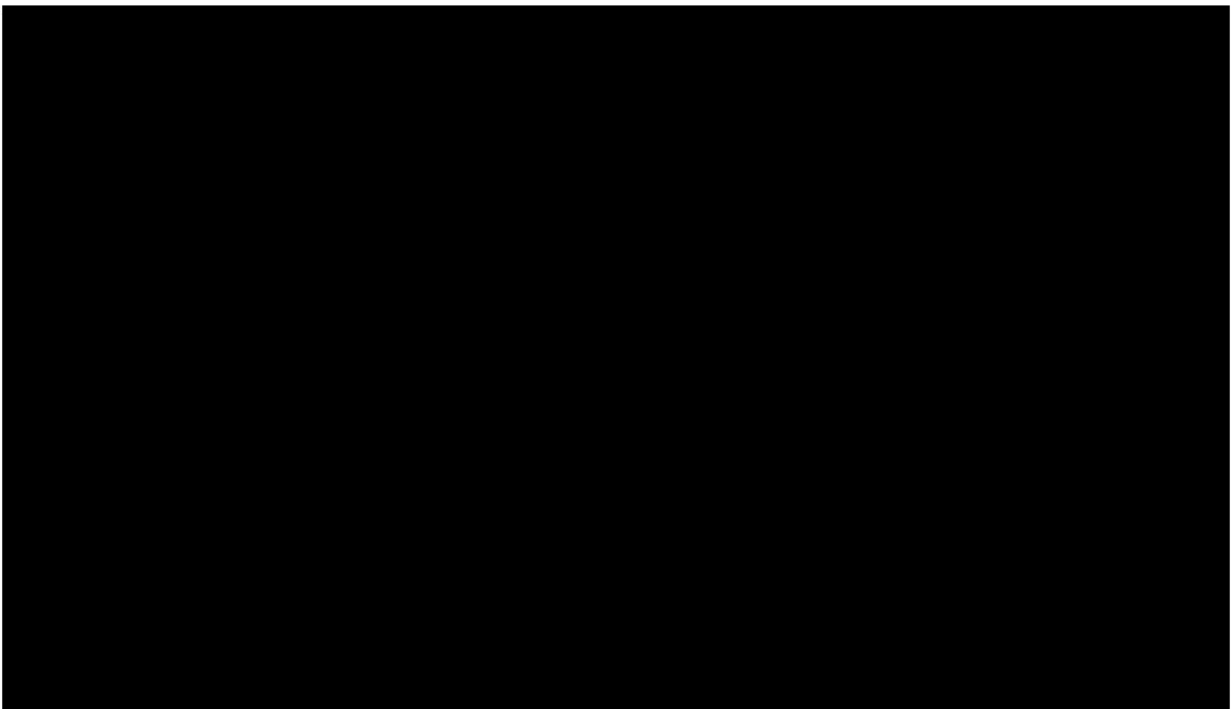


Figure 13: Location of the 0.5 ha release area (green edged polygon) within the ca. 2.6 ha rehabilitated link area (red edged polygon) between the two proposed SNA gullies. Yellow dots=copper skink detections through survey.

Notwithstanding the detailed description of lizard habitat creation below, lizard habitat within the 0.5 ha release site will need to have the following characteristics to provide habitat for viable populations both copper and ornate skinks salvaged from the footprint:

- be extensive enough in coverage to fully reinstate the loss of 0.52 ha of lizard habitat (see Table 5).
- be augmented with enough wood and rocks to support ≤ 150 copper skinks and ≤ 10 ornate skinks anticipated from salvage (see Figure 14 and associated text).
- have a mix of open areas and vegetated areas.
- be connected but adjacent to existing copper skink populations in the proposed SNA sites (see Figure 13). This will allow movement/colonization/genetic interchange between lizards of the release site, and lizards of the proposed SNAs. This connection is particularly important in a salvage project to ensure any salvaged lizards that move away from the designated release area can find suitable retreats nearby (Figure 13).

Release Site- Habitat Creation for lizards (0.5 ha)

Three types of lizard habitat patches will be created within the 0.5 ha release area; these areas are shown on Figure 14 and described

below. In addition to creating the habitat patches as described below, each habitat patch will be augmented with 25 stations of triple-layered Onduline™ ACOs to assist with persistence monitoring at year 3 (see 'Monitoring of Lizards at the 0.5 ha Release Site' below).

Habitat Patch # 1 Limestone boulder jumble

Ten rock jumbles will be created over the release site in and around existing limestone ribs, to simulate areas of rock naturally foliated from basement limestone (Figure 14). Each patch of jumble will cover ca. 10 square meters and will be situated on moderately sloping ground with a predominately sunny aspect. Boulders (ca. 1 m x 1 m average dimension³⁹, e.g., Figure 15) will be configured to maximise rock-ground contact, i.e., where possible, flat sides of the boulders will contact the ground. Once ground-layer boulders are placed at a given habitat patch, a second layer of boulders will then be placed on top to mimic naturally occurring rock jumbles found over the LMP site.

Habitat Patch # 2 Cut Wooden Rounds with Small Rock Boulders

Ten patches of mixed wood rounds⁴⁰ (untreated and approximately 1 m diameter and 25 cm thick; see Figure 16) and small limestone rock boulders (each slab will be ca. 0.5 m x 0.5 m average dimensions) will be created over the release site (Figure 14). Each patch will cover ca. 10 square meters and have an even mix of wood rounds and small rock boulders. Wood rounds and small rock boulders will be hand placed on the ground in layers to maximise retreats and basking/foraging areas for lizards.

Habitat Patch # 3 slash pile

Ten slash piles will be constructed over the release site (see Figures 14 & 17). Each slash pile will cover 3 x 4 m on average and will be up to 2 m high. A mix of branch and trunk wood will be used to construct these piles that will be situated in the vicinity of Habitat patches 1 and 2 (Figure 14).

³⁹ Boulders used as cover by copper skinks over the western pit varied in size; some were approximately 50 % smaller than this and some were approximately 50 % bigger. The dimensions suggested in this LMP are a guide only except to note that boulders used to create lizard habitat should aspire to be predominately 1 m x 1 m average dimensions.

⁴⁰ Sourced from poplars that will be felled onsite and/or sourced from nearby.

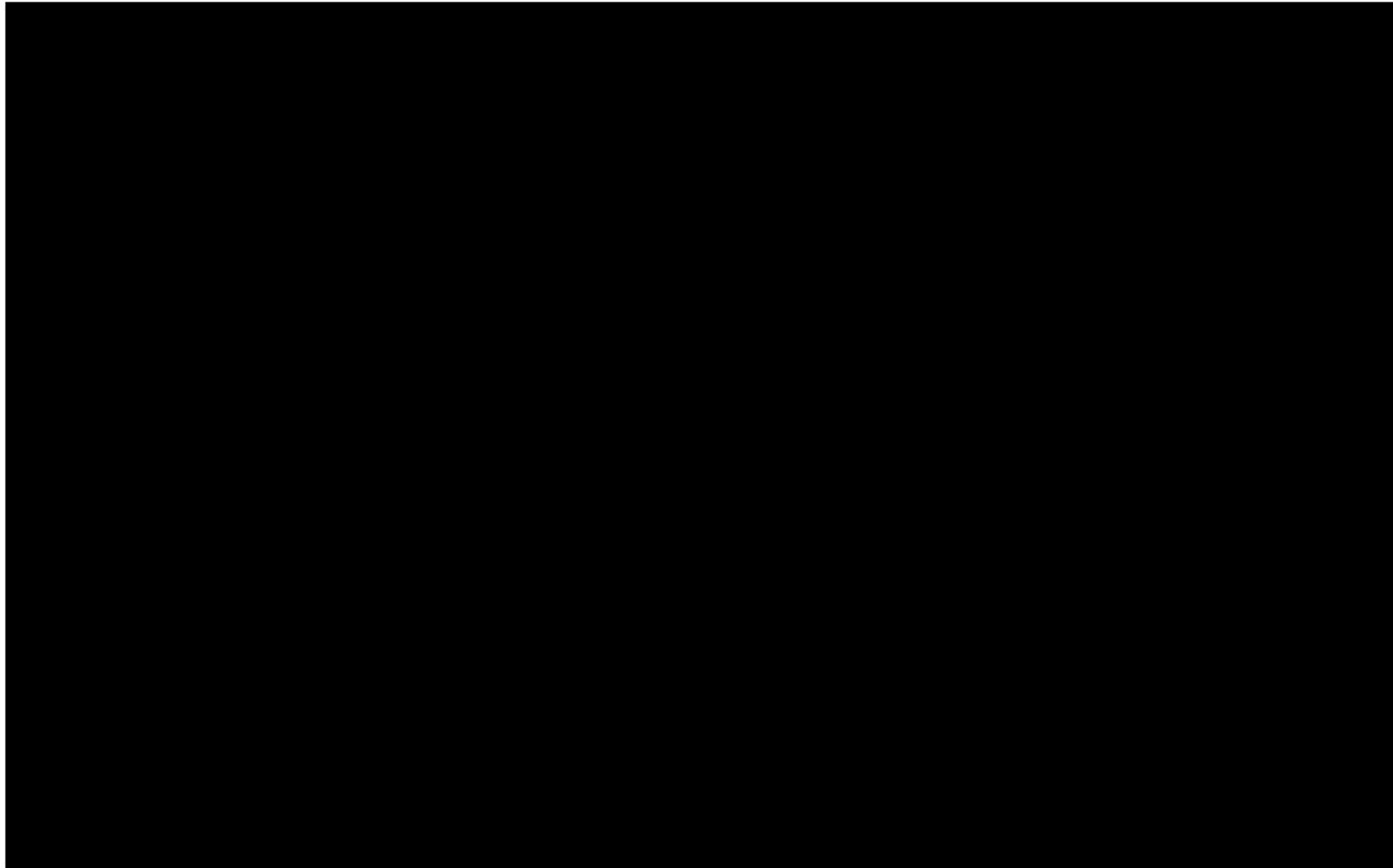


Figure 14: Release site plan showing 10 indicative locations of lizard habitat patches 1-3 described in LMP (pink, blue and orange shapes (not to scale) within the release site (green edged polygon). The rodent control area (including 20 m buffer) is shown by the yellow dotted line. The actual locations of habitat patches will be determined by access, i.e., steep areas of the release site will be avoided for health & safety reasons.



Figure 15: [Place holder figure]. Limestone rock boulders to be used to create habitat patch #1.



Figure 16: Example of cut wood rounds that will be used to create habitat patch #2 along with small limestone boulders.



Figure 17: Example of a slash pile that can be used for medium term lizard habitat enhancement.

Release Site Pest Control

As noted above under ‘Additionality’ pest and predator control is planned for the rehabilitated link area that includes the 0.5 release site, except for mice (see Condition 17b. in Appendix 1a). Pest-management planned *may* benefit resident lizard populations, but in the absence of mice control, the benefits for lizards are uncertain. For example, research has shown that mice levels need to be managed at or below 5 % tracking (percentage of tracking cards tracked as per DOC best practice protocols)⁴¹ to benefit indigenous lizards.⁴² Predator control that ignores mice may not be beneficial at all.

For that reason, mice control will also be undertaken to assist released lizards establishing at the release site. Rodent bait stations

⁴¹ <https://www.doc.govt.nz/Documents/science-and-technical/inventory-monitoring/im-toolbox-animal-pests-using-tracking-tunnels-to-monitor-rodents-and-mustelids.pdf>

⁴² Norbury, G., Wilson, D.J., Clarke, D. et al. Density-impact functions for invasive house mouse (*Mus musculus*) effects on indigenous lizards and invertebrates. *Biol Invasions* 25, 801–815 (2023). <https://doi.org/10.1007/s10530-022-02946-9>

with a rodenticide will be deployed at the 0.5 ha lizard release site and will extend out into a 20 m buffer. It is estimated that ≥ 200 rodent bait stations, at 10 m spacings, will be required to control rodents for 3 years. Bait stations will be topped up monthly and kept in place for 3-years. Rodent tracking using DOC best practice⁴³ will be undertaken twice yearly to determine if mice are indeed being suppressed with this regime, and to inform contingency mitigation actions (see Section 10).

Release Site – SNA status

Under this LMP, the lizard release site and surrounding 2.6 ha rehabilitation link area will be included in a single SNA (or equivalent) that takes in the two adjacent gully vegetation (10-ha in total).

Monitoring of Lizards at the 0.5 ha Release Site

At the 0.5 ha release site used for salvaged lizards (Figures 13 & 14), 'persistence' monitoring will take place at year 3 from release. Persistence monitoring will involve searching the release site until at least five lizards are detected using a mix of handsearching and ACOs. Monitoring will be conducted at year 3 from release to give released animals enough time to establish. Mouse control will continue until year 3 for this reason (see 'Release Site Pest Control' above). If persistence monitoring fails to demonstrate persistence at the release site, contingency mitigation will be triggered (see Section 10).

Anticipated Residual Effects

Following the mitigation measures detailed above, it is the assessment of this LMP that no significant residual adverse effects will result that relate to both lizard populations and habitats. This assessment relies heavily on effective and thorough lizard salvage and management of the release site as detailed above.

9. Incidental Discovery

Copper skinks (and a single ornate skink just outside the Phase 1 project area) were only found under rocks and decomposing logs of the LMP site, but potential habitat for other lizard species was noted

⁴³ <https://www.doc.govt.nz/Documents/science-and-technical/inventory-monitoring/im-toolbox-animal-pests-using-tracking-tunnels-to-monitor-rodents-and-mustelids.pdf>

during surveys (see Section 6). Some lizard species that are known to occur within the general area are difficult to find when at low densities, and due to the suitable (albeit highly degraded) habitat present their presence cannot be ruled out no matter how intensive the survey efforts. The destructive searches planned as part of the lizard salvage regime may very well turn up occasional individuals of a low-density gecko population. Rock formations and the edge of indigenous vegetation that will be targeted with ACOs could provide habitat for 1-2 species listed in Table 2 of this LMP, for example forest gecko and/or Raukawa gecko.

Given the past land use and generally depleted habitats of the site, however, I have assessed the likelihood of these species being present as 'low' (Table 2). However, should it become apparent during development works over the 26-ha Phase 1 project footprint that a lizard species is present other than copper or ornate skink, the project herpetologist will direct the management of the new species in full consultation with DOC. The incidental discovery will likely result in the need to carry out additional lizard management actions specific to the species discovered, and above and beyond the actions detailed in this LMP.

To assist GNZL and its contractors identify lizards encountered during development, a lizard habitat/species briefing will be carried out ahead of all works, by the project herpetologist. The briefing will focus on habitats, behaviours, and the physical appearance of copper skink, ornate skink, Raukawa gecko, and forest gecko. Briefing notes with supporting photographs of each species will be provided at the briefing to all GNZL staff and their contractors who will be working onsite during development of the Phase 1 project area.

10. Contingency Mitigation

This LMP expects that lizards salvaged from the 26 ha Phase 1: western pit and haul road project footprint will persist at their pre-prepared release site between the two gullies of the SNA (see Figures 12-14). If for reasons unforeseen at the time of writing, monitoring of persistence (methodology described above) of skink species salvaged fails to demonstrate persistence at the release site at year 2 post release; GNZL will double the level of rodent control at the release site (and 20 m buffer surrounding it) from year 2-4, but

only if rodent monitoring (see Section 8) indicates mice levels are above 5 % tracking.

11. Reporting

Following the completion of salvage over the Phase 1 project footprint, a salvage report will be prepared and submitted to DOC. This report will detail the methods and results of salvage and will also include details of release sites (descriptions of augmented habitats, size and location of the release area with supporting photos), and details of pest management and persistence monitoring carried out/planned to be carried out over the release site.

A final project close-off summary email will also be forwarded to DOC when all lizard management work (including persistence monitoring) is completed for the Phase 1 project.

Appendix 1a: Proffered Lizard Management Plan Condition

New Pit & Haul Road Site Management Plan

15. The consent holder shall, not later than four months prior to the exercise of this resource consent, submit a draft New Pit & Haul Road Site Management Plan ('the P&HMP') to the Chief Executive Officer of the WRC (or delegate) for certification that the P&HMP meets the objectives in condition 16 and addresses the matters set out in condition 17.
16. The objective for the P&HMP shall be to avoid, remedy, manage or offset the identified environmental effects of the Proposal.
17. The P&HMP shall include but not be limited to the following subparts, all of which shall be undertaken to achieve the objective set out in condition 16:
 - a. An outline of the new pit and haul road operation and processes;
 - b. An Ecological Betterment Plan ('EcoBP') (which shall include but not be limited to a Camelot Stream Sediment Management Plan ('CSSMP'), a Cave Entrance Planting Plan ('CEPP'), a Cropping Field Management Plan ('CFMP'), a Riparian Planting Management Plan ('RPMP'), a Gate Spring Management Plan ('GSMP'), a Pest and Predator Management Plan ('PPMP'), a Pastoral Grass Restoration and Native Revegetation management Plan ('PGNRMP'), a Bat Management Plan ('BaMP'), a Bird Management Plan ('BiMP'), a Lizard Management Plan ('LMP') and a Karst Ecosystem Protection Plan ('KEPP')) and shall accord with the requirements of conditions 23 and 25;
 - c. An Air Quality Management Plan ('AQMP') in accordance with conditions 54 and 55;
 - d. An Erosion and Sediment Control Plan ('ESCP') in accordance with conditions 25 to 26;
 - e. A Spill Response Plan ('SRP') in accordance with conditions 26 and 27;
 - f. A Topsoil Management Plan ('ToMP') in accordance with conditions 60 to 62;
 - g. Detailed descriptions of all of the contingency and control measures that are not set out within the EBP, DMP, ESCP or SRMP and that are to be employed by the consent holder to avoid the generation of adverse effects in the first instance, and the remediation and mitigation measures that are to be employed to minimise any adverse effects where avoidance is not practicable and/or is not required by these conditions of consent; and
 - h. The reporting that is to be undertaken by the consent holder. This shall include the detail of what is to be reported when for each year for the term of the resource consent.
18. The consent holder shall provide a draft copy of the P&HMP to TWT and the Department of Conservation no later than six months prior to the exercise of this resource consent. All comments received from the TWT and/or the Department of Conservation, together with the consent holder's responses to the same, shall be provided to the Chief Executive Officer of the WRC (or delegate) at the same time that the draft P&HMP is submitted to Chief Executive Officer of the WRC (or delegate) for certification.
19. The consent holder shall review and update the P&HMP (including all of its sub-plans) at least once every five years. A review of the PCP and the EBP shall also be undertaken not later than six months after any decision to permanently cease quarrying at the Site. Any updates to the P&HMP (or any or all of its sub-plans and, in the event that quarrying is to permanently cease, the PCP and EcoBP) shall be provided to the Chief Executive Officer of the WRC (or delegate) for certification that the revisions accord with conditions 16 and 17.

20. In addition to the requirements of condition 19 of this resource consent, the consent holder shall review the ESCP annually for the first five years of this resource consent. The consent holder shall also immediately review the ESCP if either its monitoring or monitoring conducted by the WRC shows that the receiving environment for the consent holder's discharges are not achieving water quality set out in condition 47. Any revisions to the P&HMP (or any or all of its sub-plans) required as a consequence of a review undertaken in accordance with condition 20 shall be provided to the Chief Executive Officer of the WRC (or delegate) for certification that the revisions accord with conditions 16 and 17.
21. Any revisions to the P&HMP (or any or all of its sub-plans) required as a consequence of a review undertaken in accordance with condition 20 shall be provided to the Chief Executive Officer of the WRC (or delegate) for certification that the revisions accord with conditions 16 and 17.
22. The consent holder shall ensure that an electronic copy of the most up to date version of the certified P&HMP (including all of its sub-plans) is kept on-site at all times.

Ecological Betterment Plan

23. The consent holder shall prepare an Ecological Betterment Plan (or 'EcoBP') as part of the P&HMP. The objective of the EcoBP is to set out the measures and the actions that the consent holder shall undertake to achieve a net ecological gain from the implementation of the betterment measures. This shall include setting out the measures that the consent holder shall implement to:
 - a. Compensate for the loss of indigenous terrestrial, karst and any impacts on aquatic (freshwater) habitat as a consequence of the Proposal and provide betterment in accordance with the Vision and Strategy for the Waikato River; and
 - b. Reduce the net contribution that the Site of the Proposal makes to the contaminant (sediment and nutrient) load that is discharged to the downstream surface and groundwater resources; and
 - c. Advance measures and initiatives to address the actual and potential cultural effects of the Proposal.
24. The EcoBP shall include, but not be limited to, the following:
 - a. The methods to be implemented to reduce the sediment load entering the Camelot Stream Catchment. The methods, the timeframe for their implementation, the programmes of monitoring to confirm their effectiveness, and the nature and frequency of the reporting to the WRC shall be set out in a CSSMP, which is to form an appendix to the EcoBP;
 - b. The methods to be implemented to reduce the sediment lost from the cropping fields that are located outside of the footprints of the new pit and haul road but that are within the Site. The methods, the timeframe for their implementation, the programmes of monitoring and required maintenance to confirm their effectiveness, and the nature and frequency of the reporting to the WRC shall be set out in a CFMP, which is to form an appendix to the EcoBP;
 - c. The methods that are to be used to control pests and predators in the headwater streams to the Site, cave entrances, the rocky outcrops that support terrestrial fauna, and the tomos that support terrestrial fauna and flora. These features shall be located a maximum of 10 kilometres from the cadastral boundaries of the site. The methods, the timeframe for their implementation, the programmes of monitoring to confirm their effectiveness, and the nature and frequency of the reporting to the WRC shall be set out in a PPMP, which is to form an appendix to the EcoBP;

- d. A plan which shows the reaches (and extent) of the riparian eco-sourced native planting that is to be undertaken and maintained by the consent holder between the Mangawhitikau resurgence and Oparure Road. The planting, its stages, the proposed planting schedules and the on-going maintenance requirements are to be set out in a RPMP which is to form an appendix to the EcoBP;
- e. A plan which shows the pastoral grass and eco-sourced native planting that is to be undertaken and maintained by the consent holder to restore the retired quarry surfaces and to ensure that the biological diversity of the site is enhanced. The planting, the proposed planting schedules, the depth and location of the topsoil reinstatement that is to occur prior to planting, and the on-going maintenance requirements are to be set out in a PCNRMP which is to form an appendix to the EcoBP;
- f. A plan which shows the eco-sourced native planting that is to be undertaken and maintained by the consent holder in the riparian margins around Pōtea (Gate Spring). The planting, its stages, the proposed planting schedules and the on-going maintenance requirements are to be set out in a GSMP which is to form an appendix to the EcoBP;
- g. A plan which shows the karst ecosystems (which is defined as landscape features such as cave entrances, sinkholes / dolines, calcareous cliffs, scarps and tors and the wetland adjacent to the Guilford Cave) that are to be protected by the consent holder. The form of enhancement (be it via cave entrance protection, the reconstruction of rock piles, pest and animal control, native planting (including of cave entrances), and stock proof fencing), the proposed planting schedules and the on-going maintenance requirements are to be set out in a KEPP which is to form an appendix to the EcoBP;
- h. A series of plans that set out the management and monitoring techniques that are to be employed to protect and then manage the indigenous / native species of bats, lizards and birds that are present within the Site. The purpose of all three plans is to manage the native bird, lizard and bat species present within the Site so that any effects on them are minimised and to reduce predation and increase breeding success. The management techniques and predator controls, its stages and timing, and the on-going monitoring requirements are to be set out in a LMP, BiMP, BaMP all of which are to form an appendix to the EcoBP; and
- i. Where it is practicable to do so, the methods that the consent holder shall employ to, as far as practicable, source native plants from local suppliers and engage local contractors to deliver the ecological mitigation works.

Betterment Initiatives

- 25. The consent holder shall ensure that the following betterment initiatives are identified and implemented no later than three (3) years after the commencement of this resource consent commencing. The BMP shall set out how each of the following betterment initiatives are implemented:
 - a. Not less than 30 cave entrances shall be protected from stock and enhanced by planting and pest control. The cave entrances that are protected and enhanced shall be identified by an independent suitably qualified and experienced expert and the cumulative floor area of the cave shall sum to not less than 350 square metres in area. All of the cave entrances that are protected and enhanced by the consent holder shall be within 10 kilometres from the cadastral boundaries of the site;
 - b. Not less than 11.6 hectares of existing and/or reconstructed karst ecosystems / formations that occur outside of the footprint of the new pit and haul road shall be identified by an independent suitably qualified and experienced expert and both protected and enhanced by the consent holder. The 11.6 hectares shall be in addition to and flora that is protected and enhanced in accordance with the other clauses of this condition;

- c. Not less than 5.35 hectares of native / indigenous flora outside of the footprint of the new pit and haul road and north of the new pit shall be identified by an independent suitably qualified and experienced expert and both protected and enhanced by the consent holder. The 5.35 hectares shall be in addition to the flora and fauna that is protected and enhanced in accordance with the other clauses of this condition;
- d. A comprehensive regime of stormwater and sediment / erosion controls shall be implemented on not less than 7.06 hectares of existing cropping fields that are not located within footprint of the new pit or the proposed haul road (they shall include but not be limited to the Guilford Cave entrance, the wetland next to the Guilford Cave entrance, and the 14 dolines that are located to the north of the New Pit). The establishment of the regime of the stormwater and sediment / erosion controls and the identification of the area(s) that they are to be applied to shall be identified by an independent suitably qualified and experienced expert. The controls shall be implemented to minimise the non-point source discharge of nutrients and sediment off the cropping fields within the site (but outside of the footprints of the new pit and haul road) and offset (alongside other measures) sediment loads arising from the Proposal;
- e. Not less than 6.5 hectares of ecologically significant existing forest habitat (as identified by an independent suitably qualified and experienced expert) and the entrance to the Guildford Cave shall be legally protected in perpetuity. The 6.5 hectares shall be in addition to the habitat protection required in accordance with the other clauses of this condition;
- f. Not less than 17.02 hectares of riparian planting (using appropriate, locally sourced, indigenous / native plant species) shall be undertaken in the catchment of the Camelot Cave Stream. The areas of riparian planting shall be identified by an independent suitably qualified and experienced expert. The 17.02 hectares of riparian planting shall be in addition to the habitat that is to be protected and enhanced in accordance with the other clauses of this condition; and
- g. Not less than 2.5 hectares and 0.27-ha of riparian planting (using appropriate, locally sourced, indigenous / native plant species) shall be undertaken to connect existing native riparian habitats in the catchments of the Mangawhitikau Stream and Gate Spring respectively. The areas of riparian planting shall be identified by an independent suitably qualified and experienced expert. The riparian planting required by this condition of consent shall be in addition to the habitat that is to be protected and enhanced in accordance with the other clauses of this condition.

Appendix 1b: Ecological Conditions imposed by OIO

1.3 Environmental protections:

You must undertake the following environmental protections:

Significant Forested Areas (approx. 6.5 ha)

(a) fencing to prevent stock access to the approx. 6.5 ha of Significant Forested Areas;

(b) carrying out on-going possum control on the approx. 6.5 ha of Significant Forested Areas;

(c) protect the approx. 6.5 ha of Significant Forested Areas using a QEII covenant (or another mechanism, if recommended by and agreed with DoC and QEII Trust).

Guildford cave entrance(s)

(d) fencing to protect the cave entrance(s); and

(e) protect the cave entrance(s) using a QEII covenant (or another mechanism, if recommended by and agreed with DoC and QEII Trust).

1.5 On-going environmental monitoring of protected areas:

You must cover the costs of on-going environmental monitoring of the areas of the Land that are subject to the protective covenants, and comply with related recommendations/conditions (up to a maximum average annual cost of \$2,500 per annum).

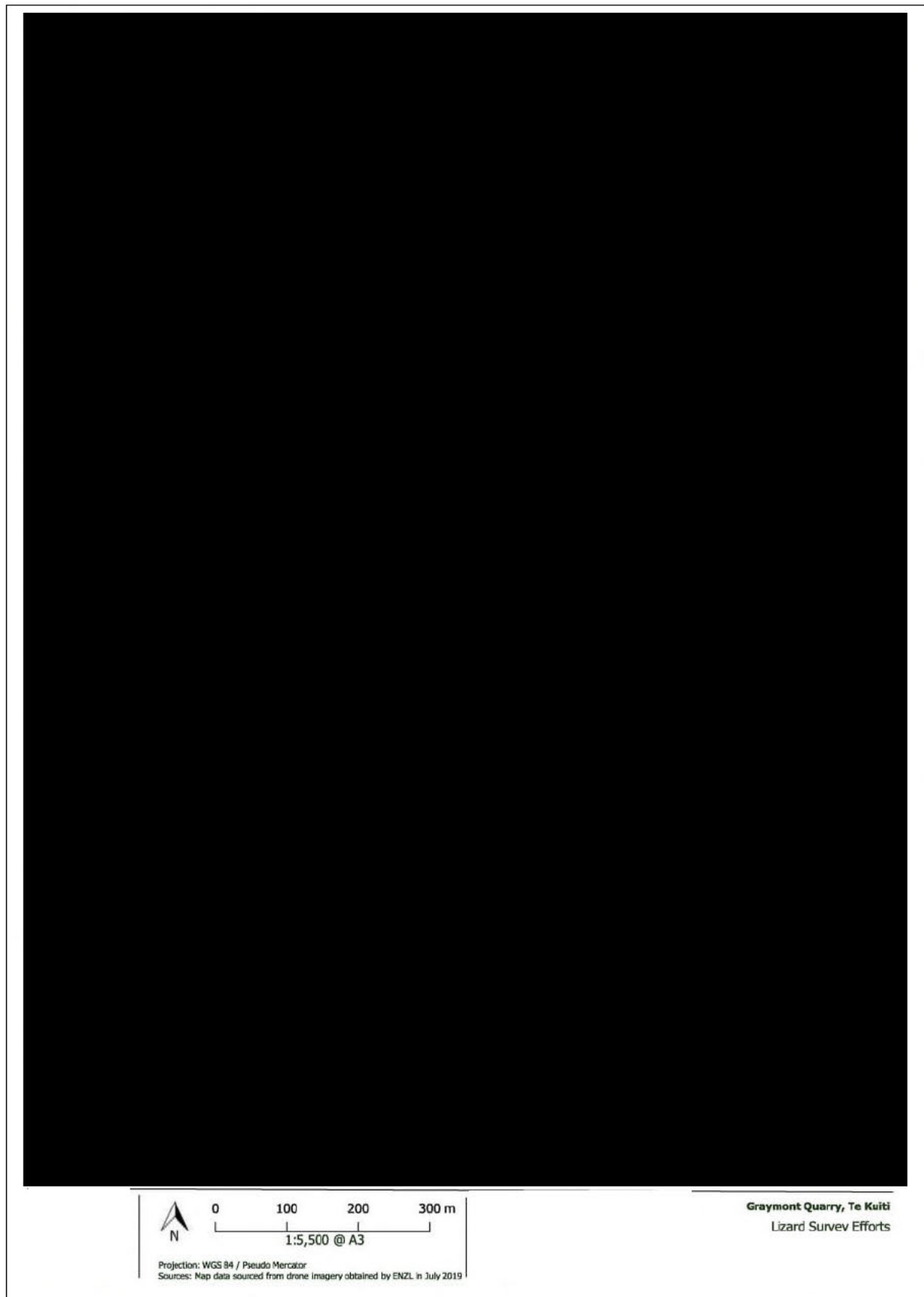
4.1 Prepare remediation plan and implementation

conditions: You must include a draft site Remediation and Betterment Plan in the application(s) for the resource consent to quarry on the Land, and include conditions that necessitate implementation of remediation.

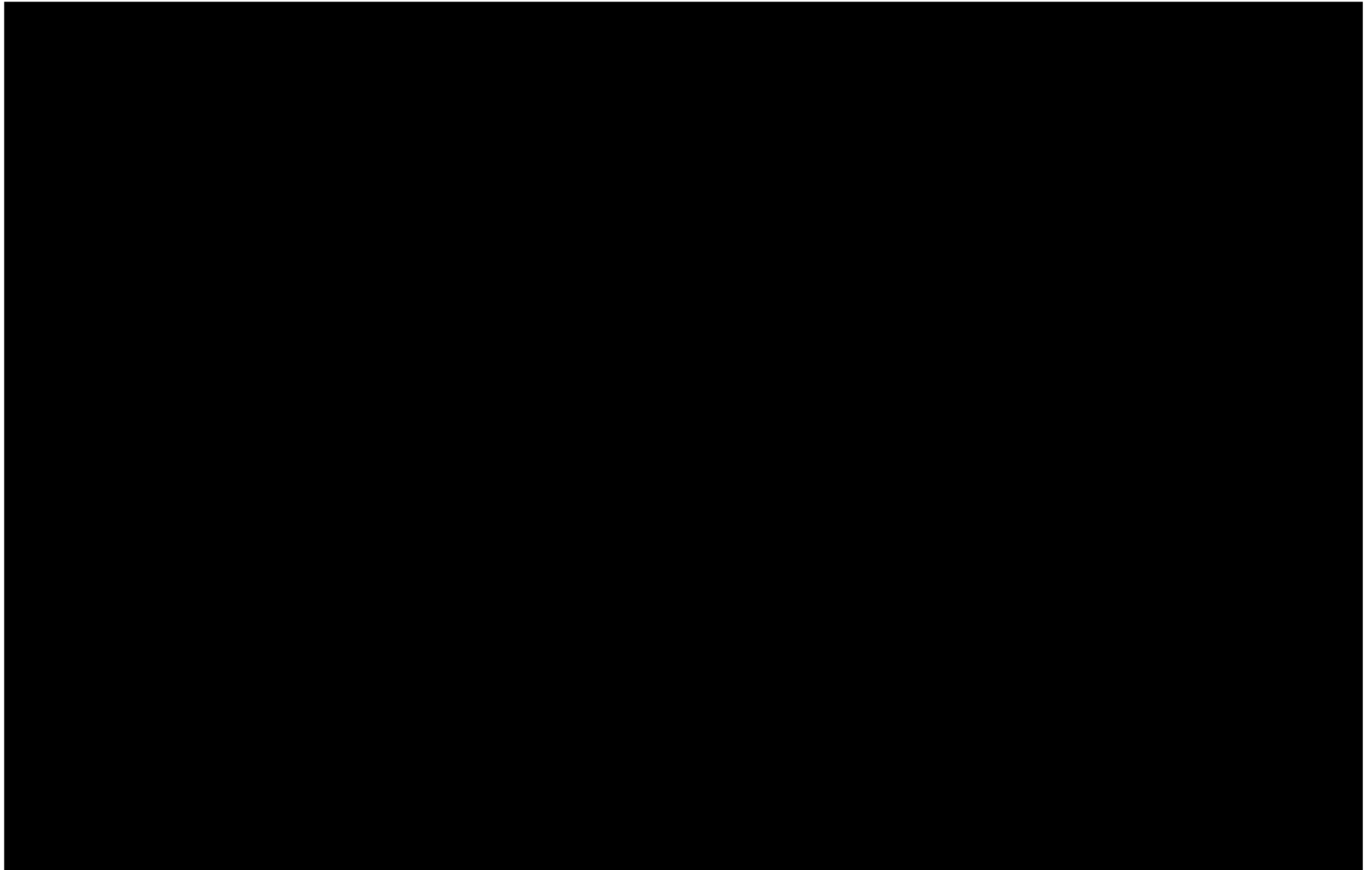
The Remediation and Betterment Plan must be prepared with assistance from environmental specialists.

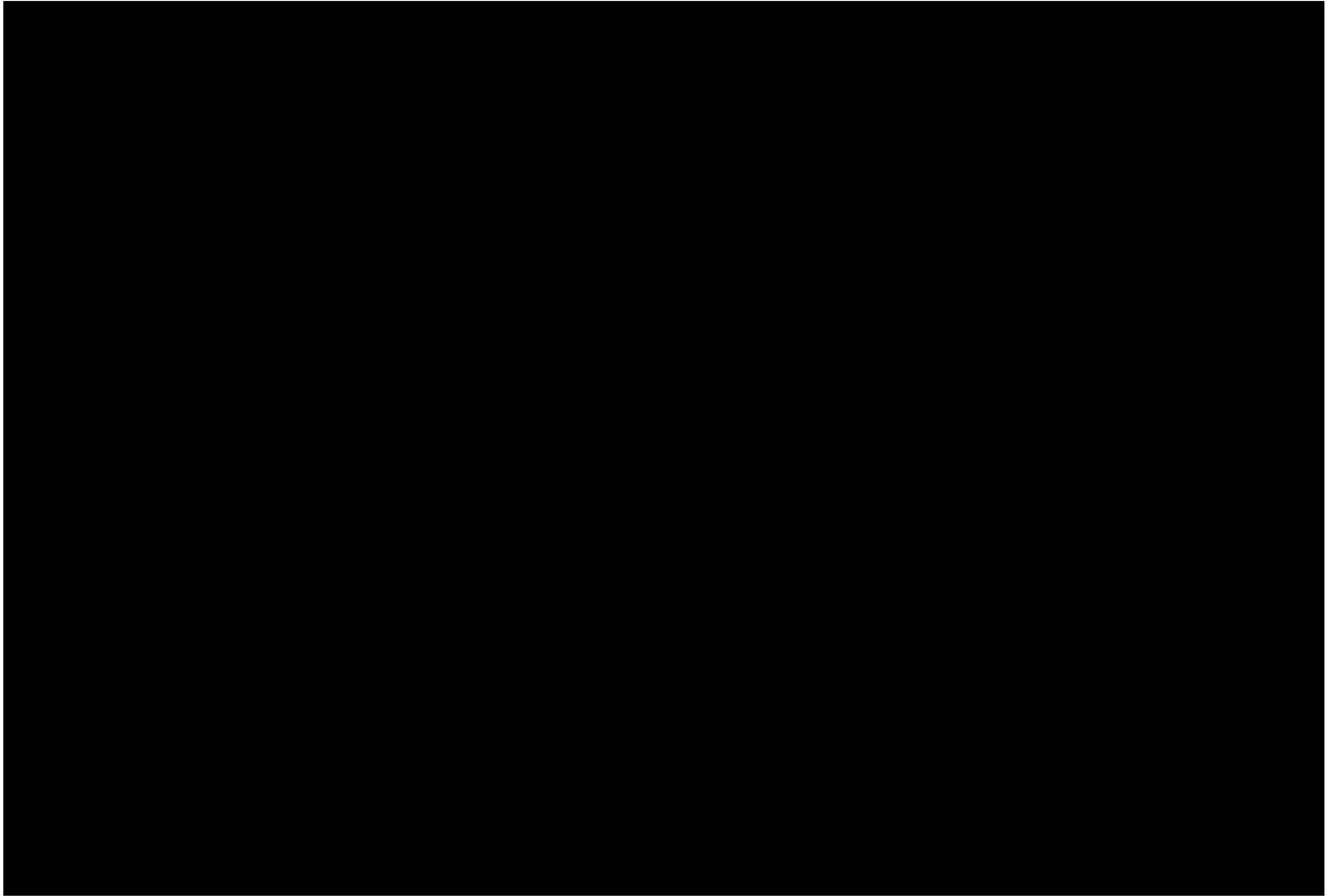
4.2 Guarantee site remediation: In the event of a resource consent being issued for a quarrying project on the Land, you must guarantee site remediation by way of a bond (or some other form of security) for site rehabilitation. The beneficiary of the bond/guarantee/other security will be the relevant Local or Regional Authority.

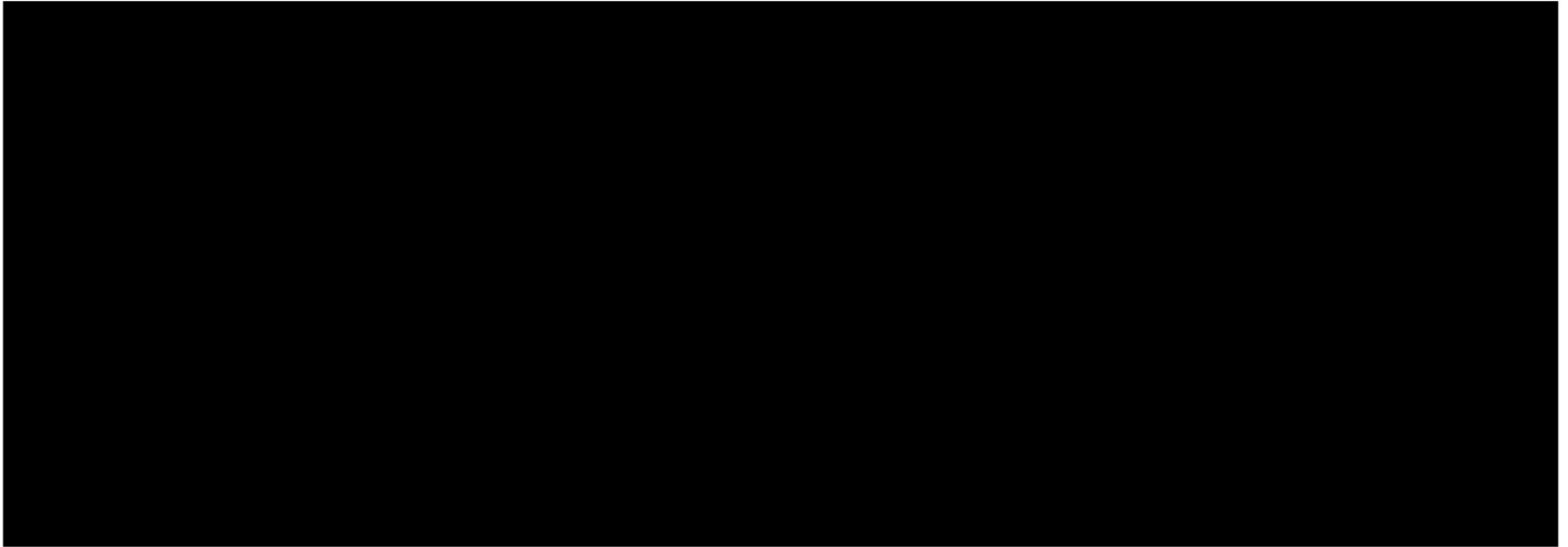
Appendix 2: Areas searched by Ecology NZ in 2019.



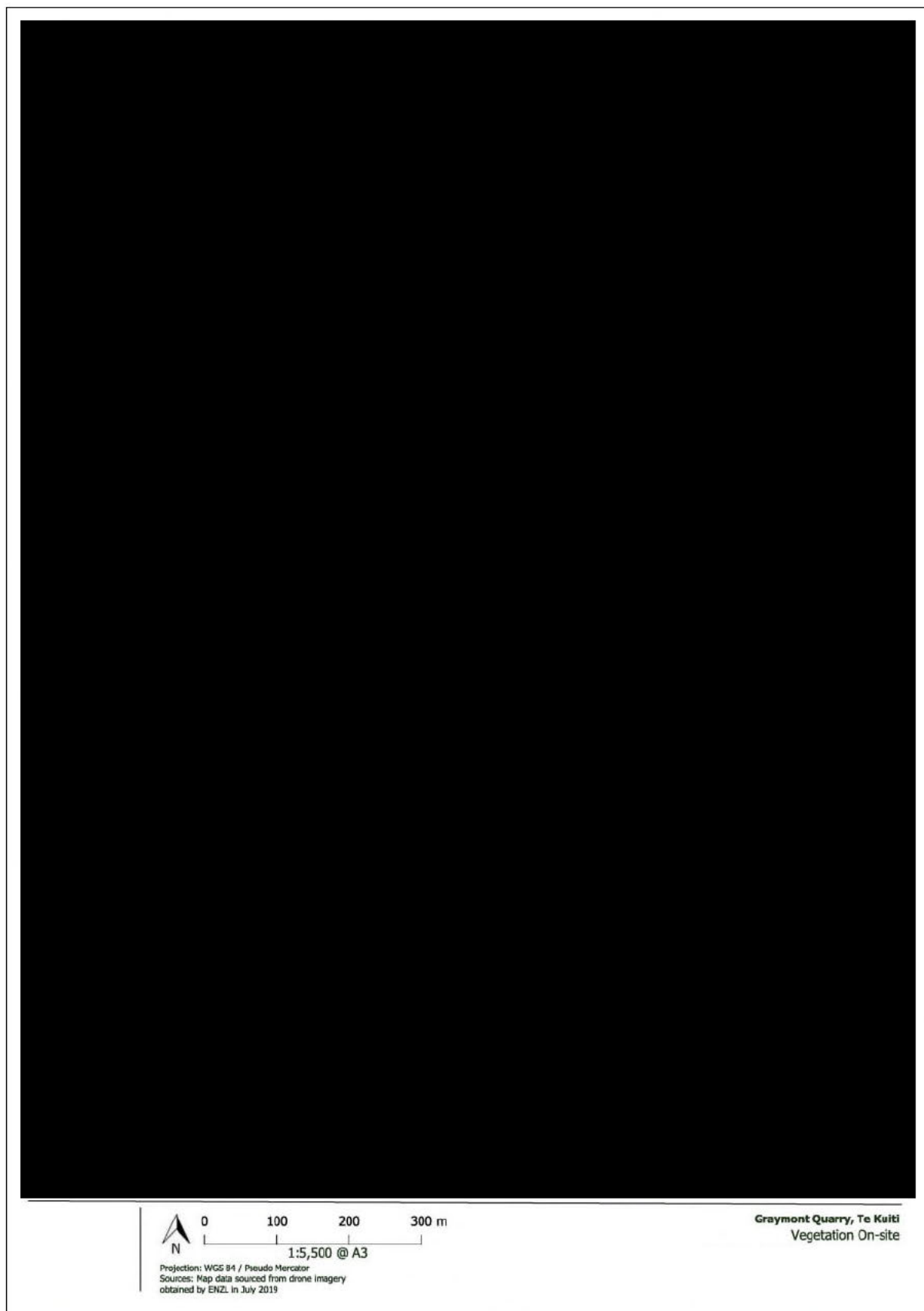
Appendix 3: Georeferenced locations of lizard detections 2019-2021







Appendix 4: Mapped Vegetation and Lizard Habitats of Western pit and haul road project footprint.



Appendix 5: Definition of effect for this LMP (from RMA, 1991)

3 Meaning of effect

In this Act, unless the context otherwise requires, the term **effect** includes—

- (a) any positive or adverse effect; and
- (b) any temporary or permanent effect; and
- (c) any past, present, or future effect; and
- (d) any cumulative effect which arises over time or in combination with other effects—
regardless of the scale, intensity, duration, or frequency of the effect, and also includes—
- (e) any potential effect of high probability; and
- (f) any potential effect of low probability which has a high potential impact.

Section 3: amended, on 7 July 1993, by [section 3](#) of the Resource Management Amendment Act 1993 (1993 No 65).