

Hunua Quarry Development

Securing Auckland's aggregate for the next 80 years

FAST-TRACK APPROVALS ACT 2024 · FTAA-2603-1185



Panel Briefing — Introduction to the Project

Winstone Aggregates (a division of Fletcher Concrete and Infrastructure Limited)



WINSTONE
AGGREGATES

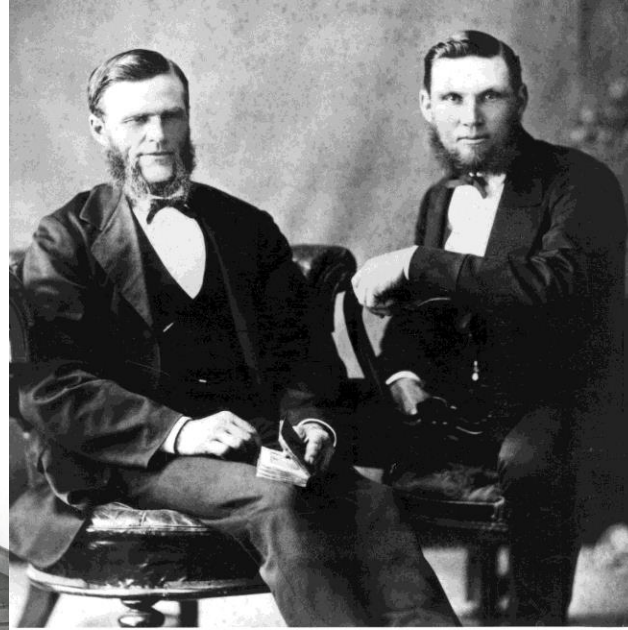
**BOFFA
MISKELL**

Winstone Aggregates



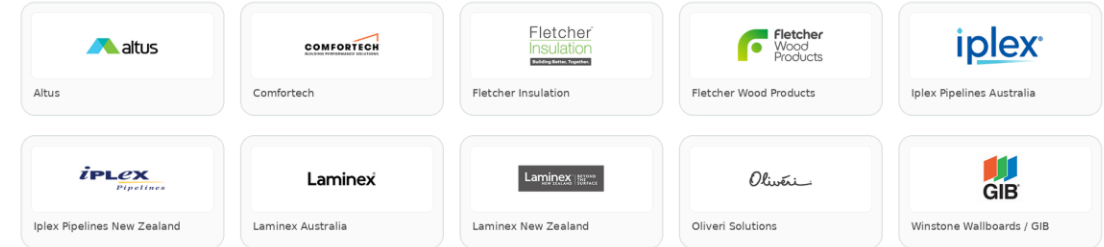
Winstone Aggregates

- Structure
- Background
- History

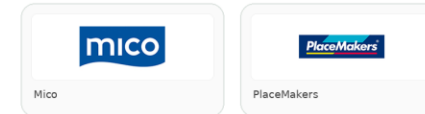


Fletcher Building brands

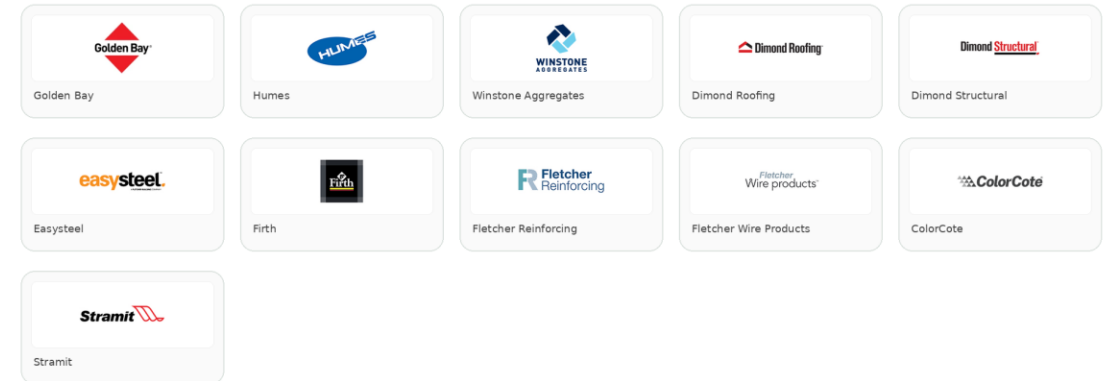
Light Building Products



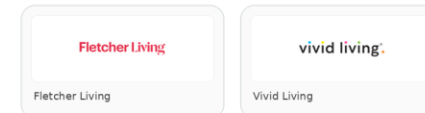
Distribution



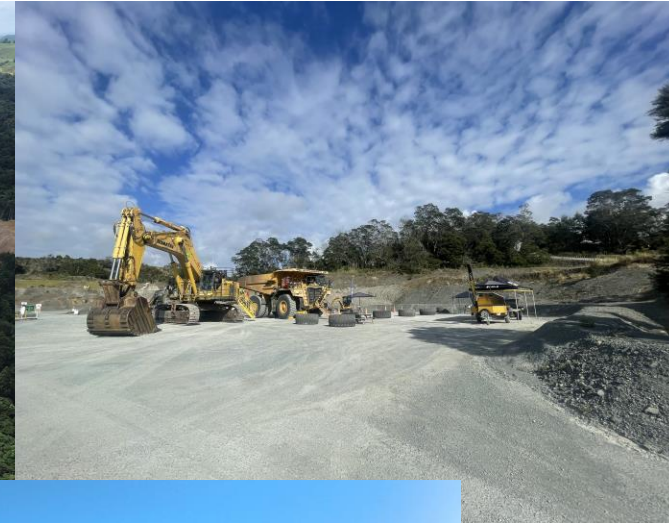
Heavy Building Materials



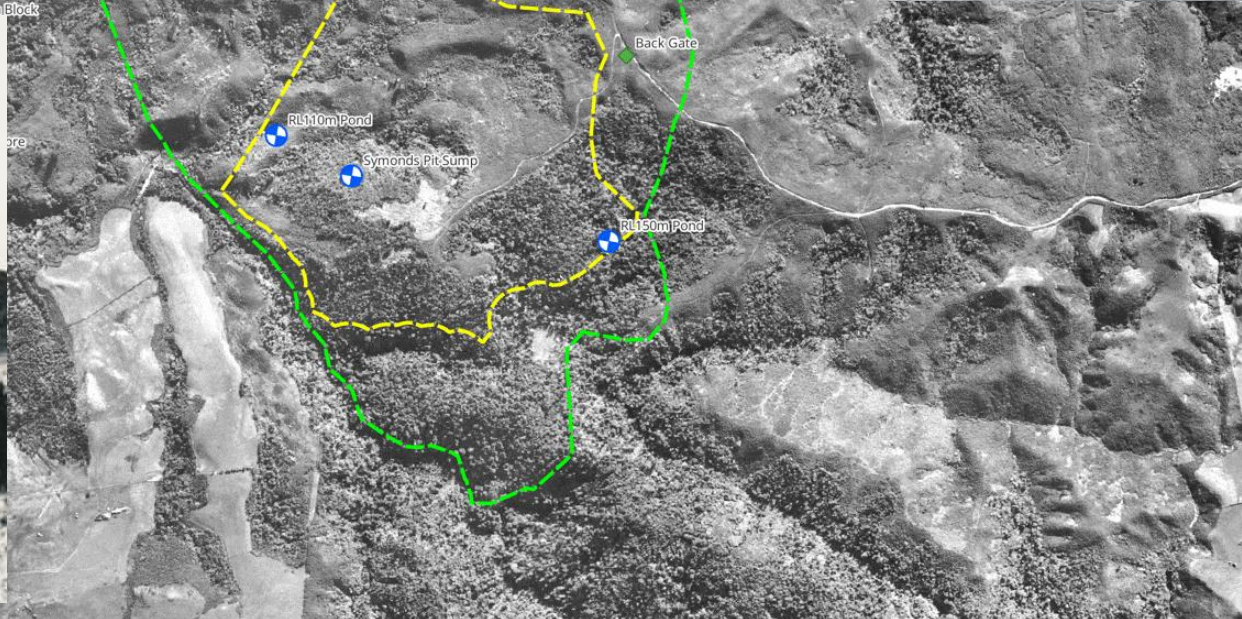
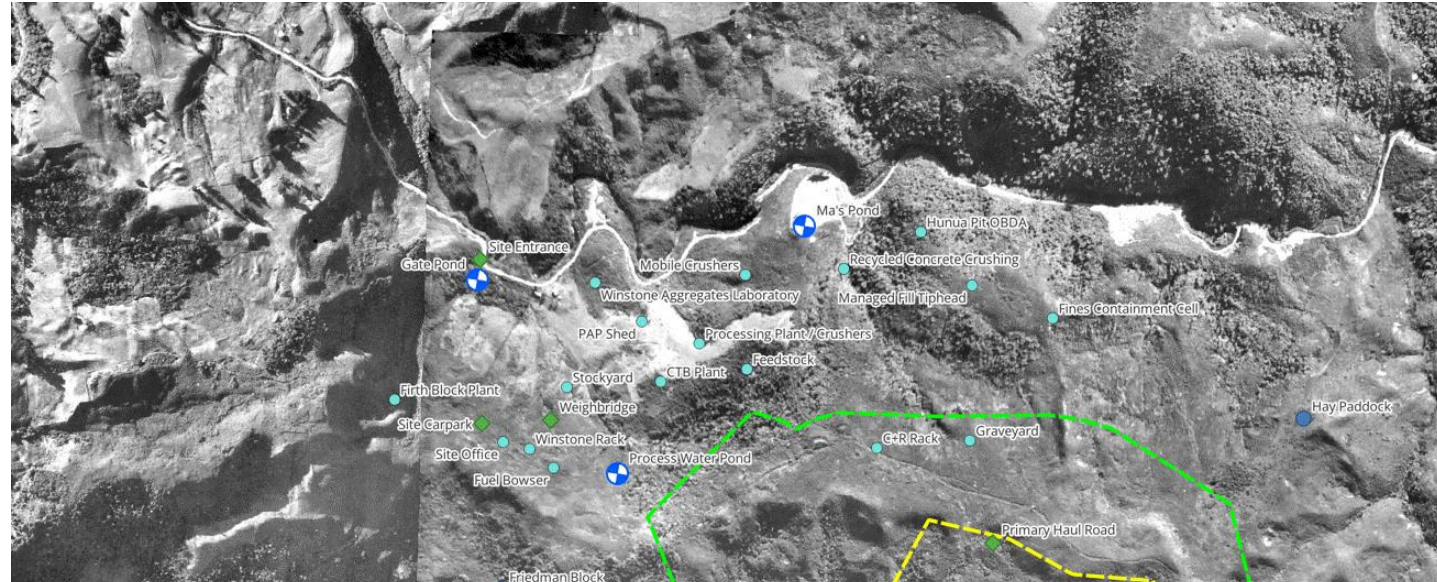
Residential and Development



• Winstone's Quarry Portfolio

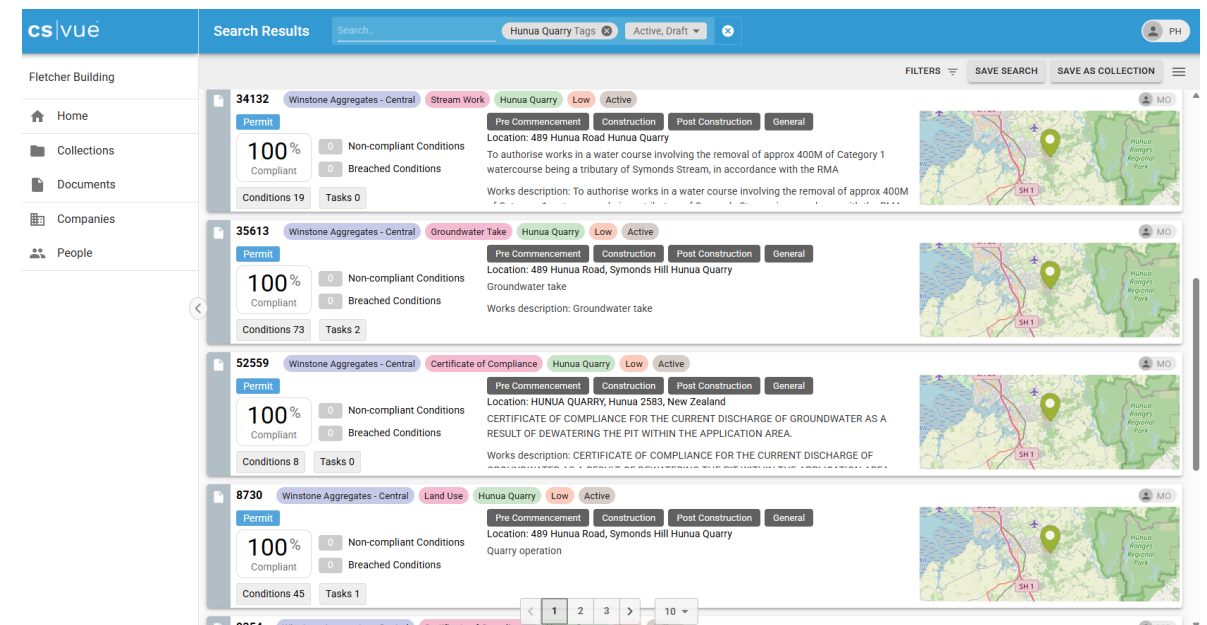


Hunua Quarry



Winstone Aggregates

- Strong relationships and partnerships
- Environmental Management Systems



The Project

The project at a glance

Winstone proposes to **develop and deepen the existing Symonds Hill Pit** at the established Hunua Quarry to access additional high-quality greywacke, extending the life of the quarry for a further 80 years.

225 Mt

Resource accessible
(favourable strip ratio)

5.4 Mtpa

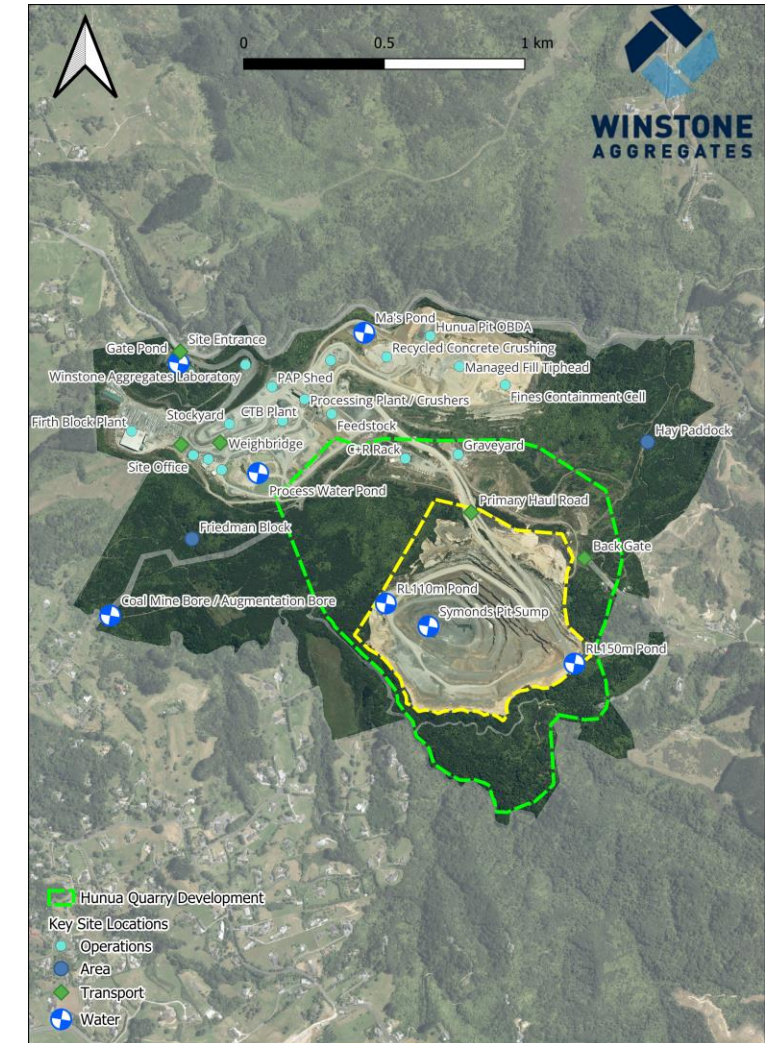
Peak production capacity

80 yrs

Continued aggregate supply
secured

WHAT THE PROJECT INVOLVES

- Development and deepening of the current Symonds Hill Pit
- A stream realignment and a new western haul road to enable resource access
- A comprehensive ecological offset, compensation and pest-management package
- Upgraded water management and environmental performance



Hunua Quarry, 489 Hunua Road — ~35 km SE of Auckland CBD

A project the region needs

\$663–853m

Transport, emissions & social costs avoided by keeping supply close to Auckland

~\$132m

Economic activity generated — about \$69m within the Auckland region

~2,400

Job-years of direct employment supported

>\$65m

Annual turnover (existing)

\$1.8m / yr

Fuel saved by the new western haul road

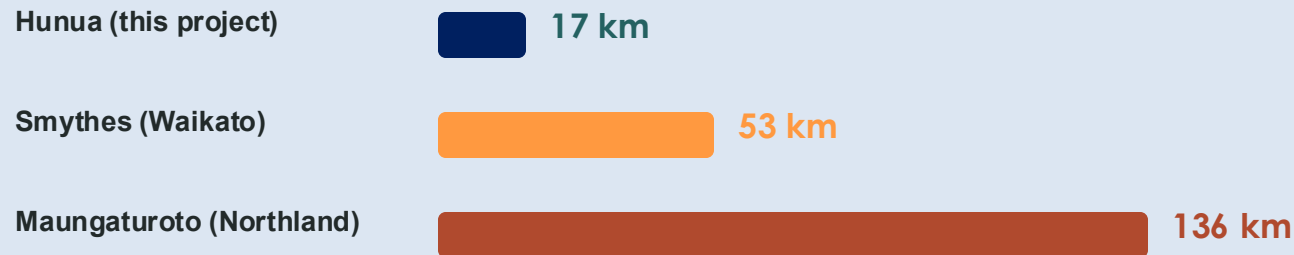
Net gain

Targeted for terrestrial ecology; no net loss for freshwater

Securing Auckland's aggregate supply

Auckland's aggregate market has been **structurally short for 15+ years**. Aggregate can only be won where it lies, and is best extracted close to where it is used. Hunua is one of Auckland's three most strategically important sources.

WEIGHTED AVERAGE HAUL DISTANCE TO MARKET (km)



Fewer truck-kms for every tonne — the basis of the **\$663–853m in transport, emissions and social costs avoided**.

THE ALTERNATIVE: A NEW QUARRY

Establishing a comparable new quarry elsewhere would take

~10 years to operate

~\$300m to develop

Suitable alternative locations within the Auckland Region are difficult to identify due to the potential for effects on existing uses.

Continuing at Hunua avoids those costs and effects.

A more efficient, lower-emission operation

- The new **western haul road** reshapes the operation — fewer truck movements, less fuel, lower emissions for every tonne delivered.
- Every tonne won at Hunua rather than the Waikato or Northland means fewer heavy-vehicle kilometres and lower carbon.

33%

Reduction in haul circuit time

32%

More tonnes delivered per truck-hour

\$1.8m

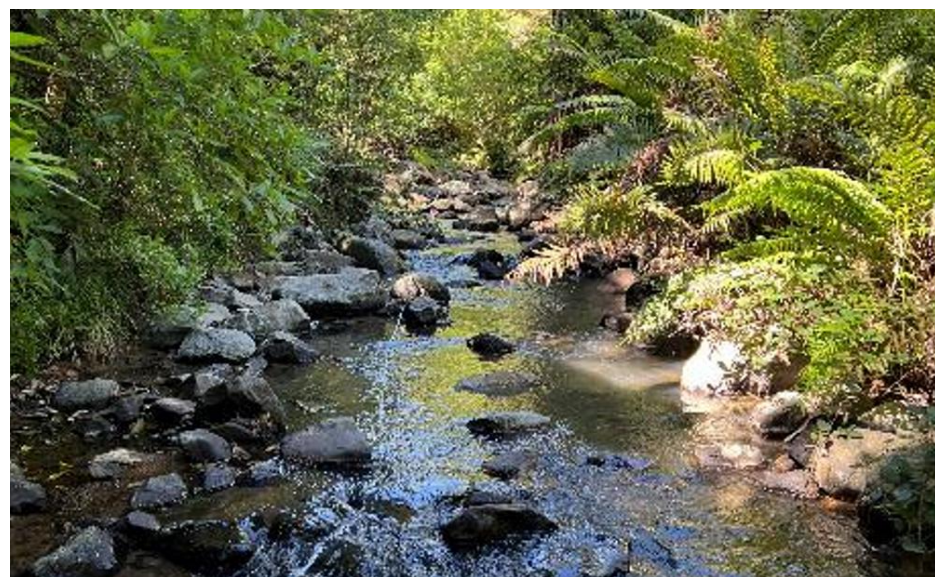
Annual fuel savings

~50%

Expected reduction in tyre costs

A quantified climate benefit. Avoided heavy-vehicle travel delivers lower fuel use and lower carbon emissions across the life of the consent — alongside fewer trucks on the road and improved operational safety.

A net gain



85.62 ha

new replanted indigenous vegetation

16.33 ha

existing native bush protected

~8,000 m

stream realignment & enhancement

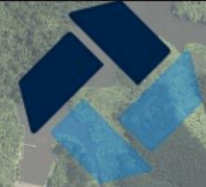
Pest control

landscape-scale & integrated

85.62 ha new native planting

Designed to achieve **no net loss for freshwater and a net gain for terrestrial values.**

Part B, p. 188 — ecological offset & compensation package



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AGGREGATES

-  Hunua Quarry Development
- FCIL owners - Before and after Referral
-  After
 -  Before



Project	Hunua Quarry Development
Name	FCIL controlled properties
Drawing	5020
Rev	1
Date	7 July 2026
Author	PWH



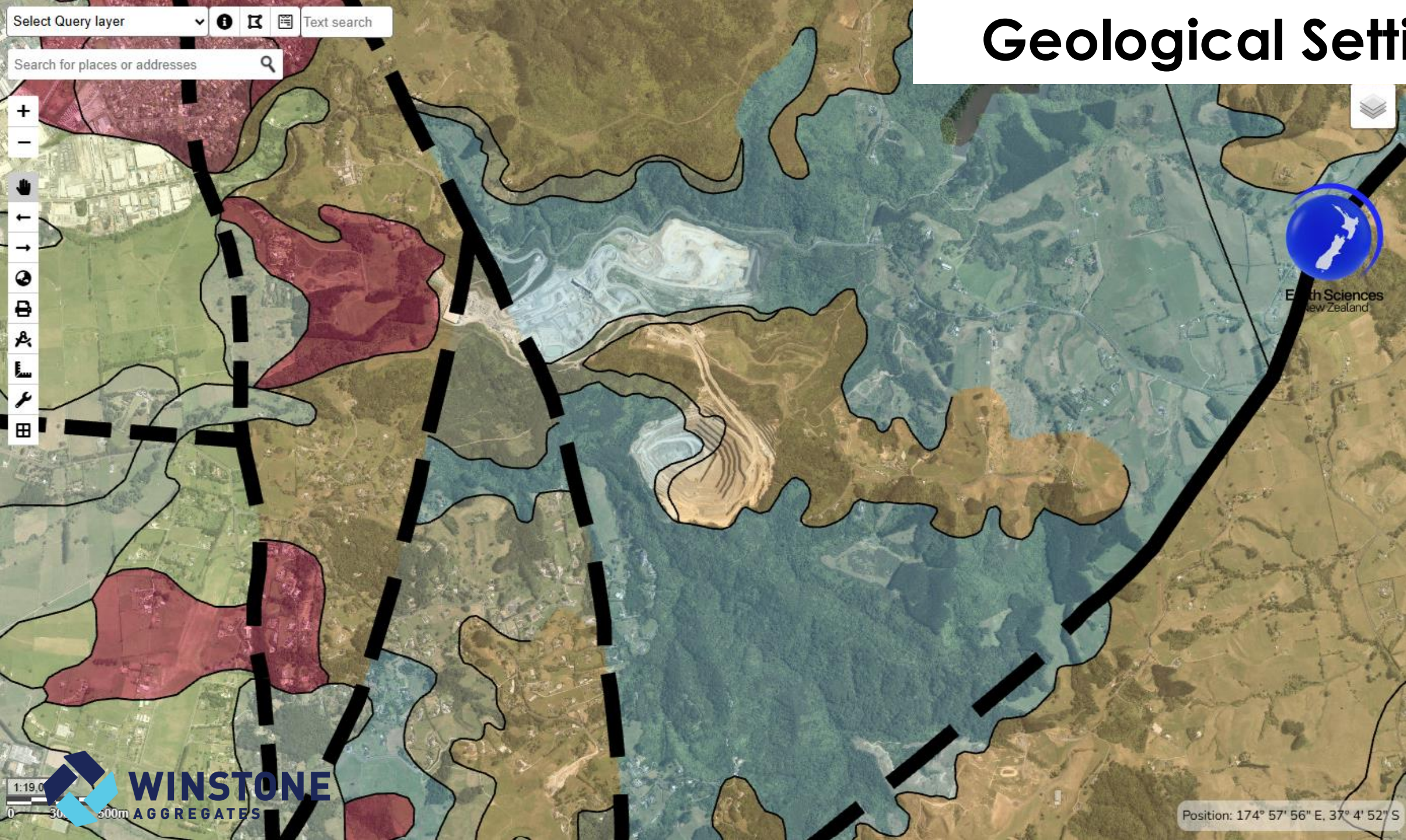
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AGGREGATES

Operational overview

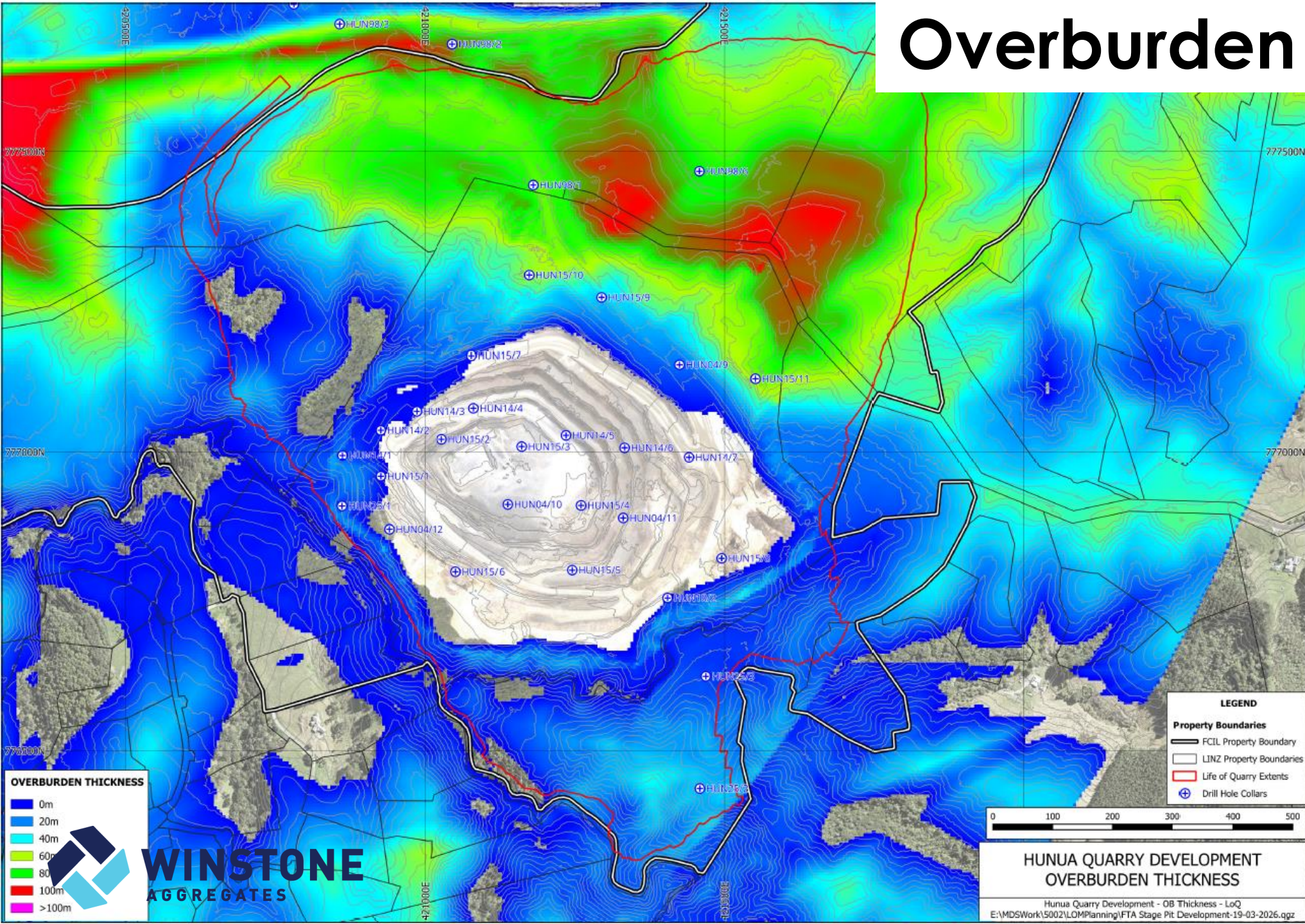
Site Overview



Geological Setting



Overburden Thickness



2025-12-22T06:59:04+13:00

Overburden Removal



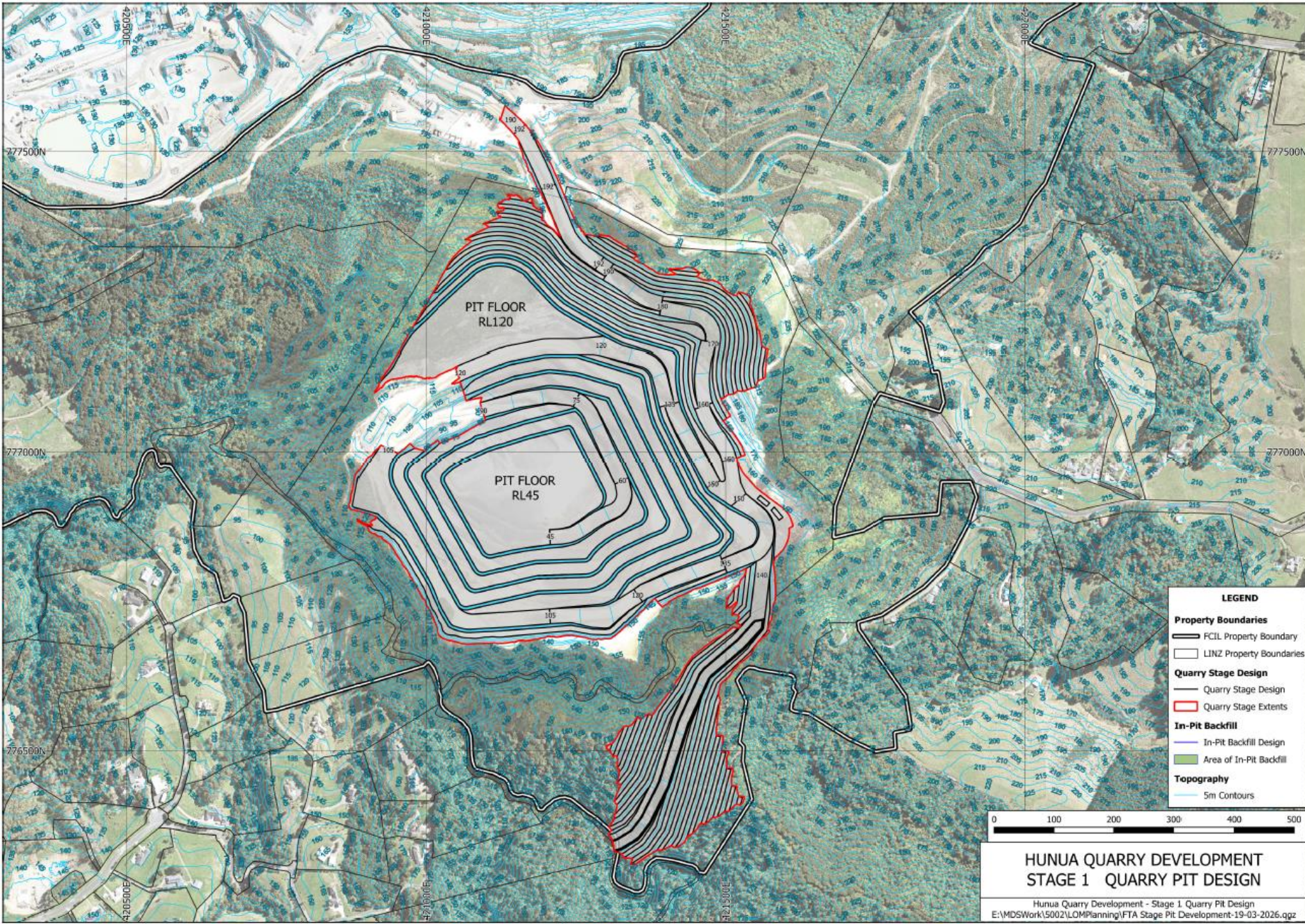
Overburden - North



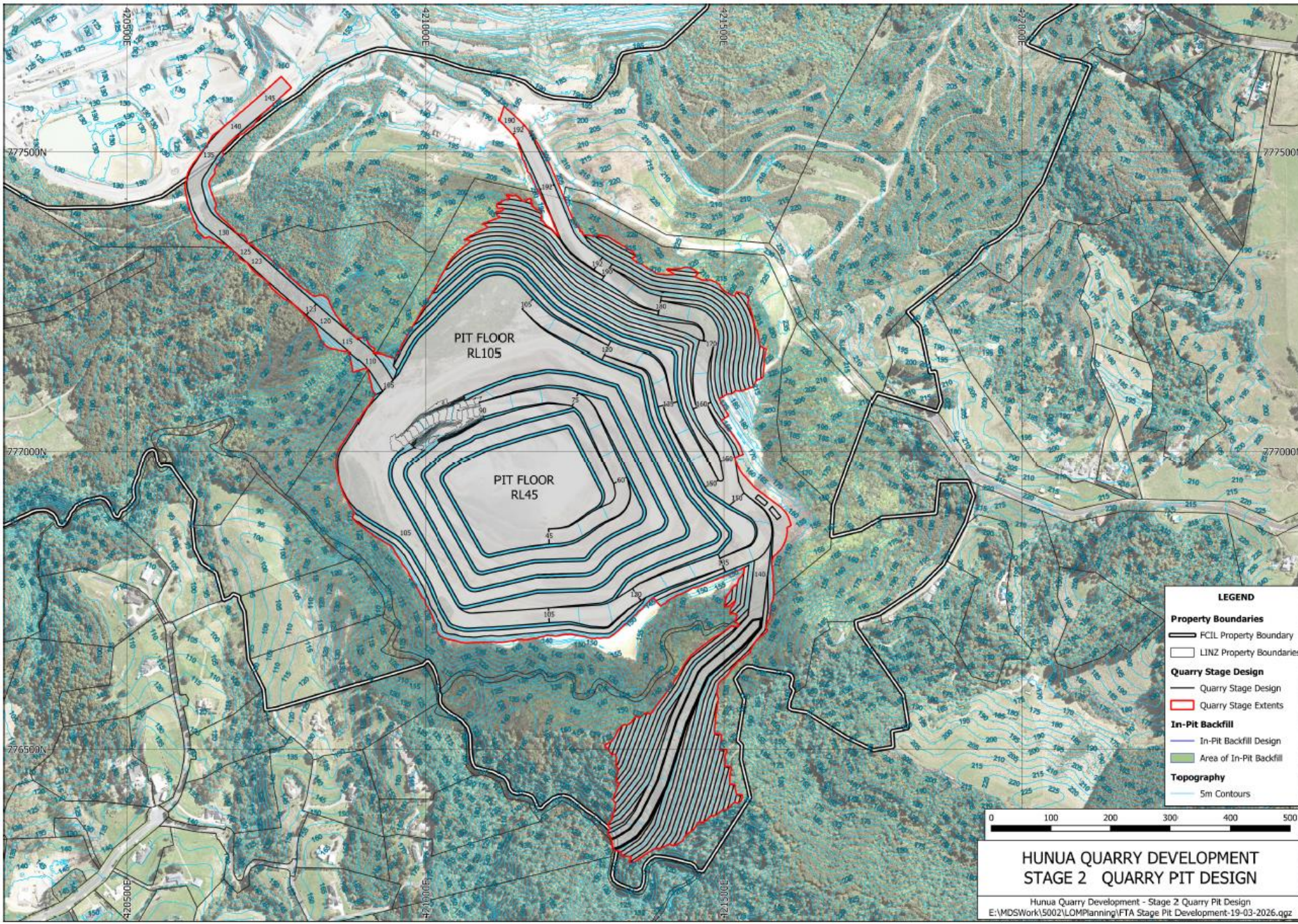
Overburden - South



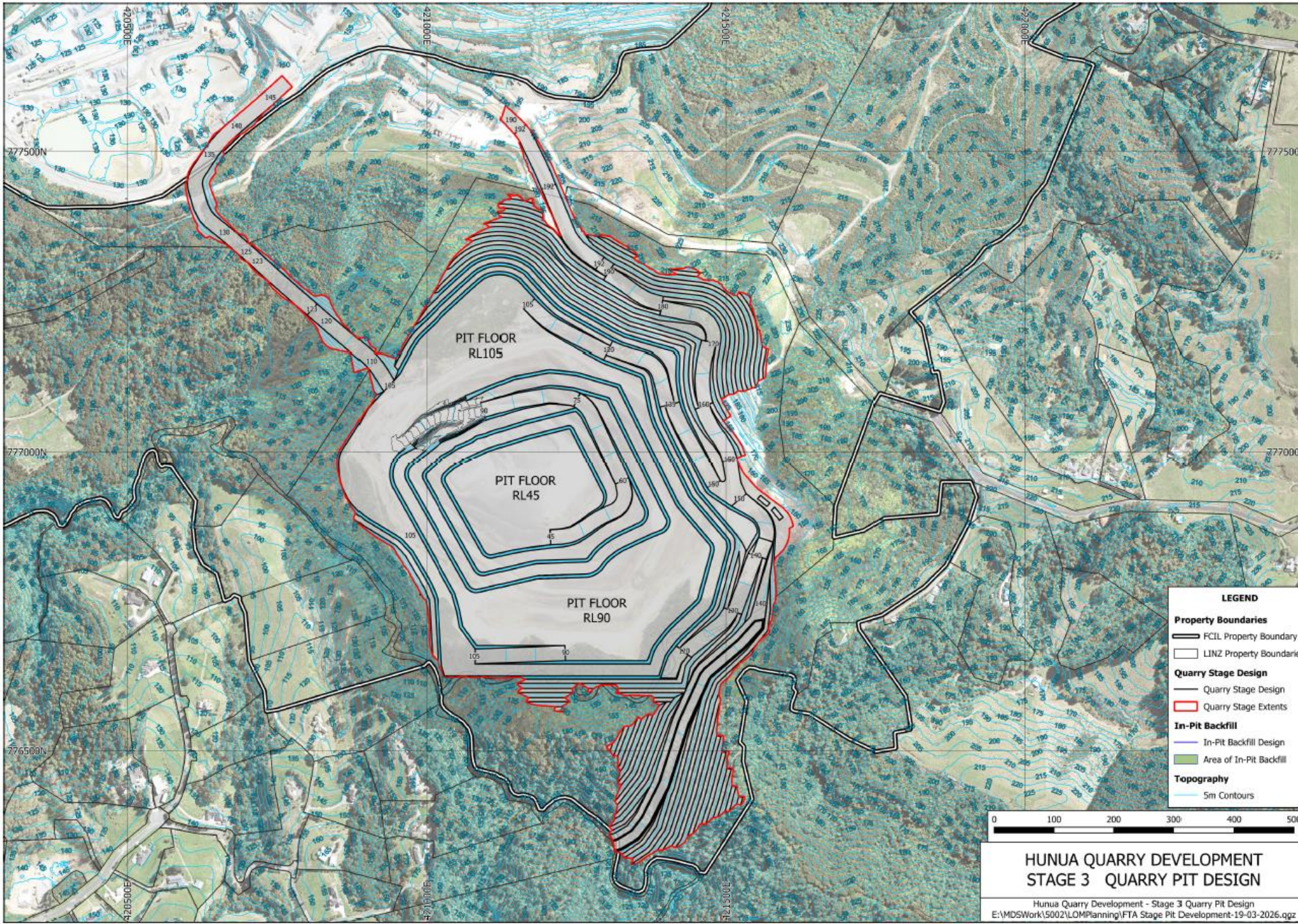
Stage 1



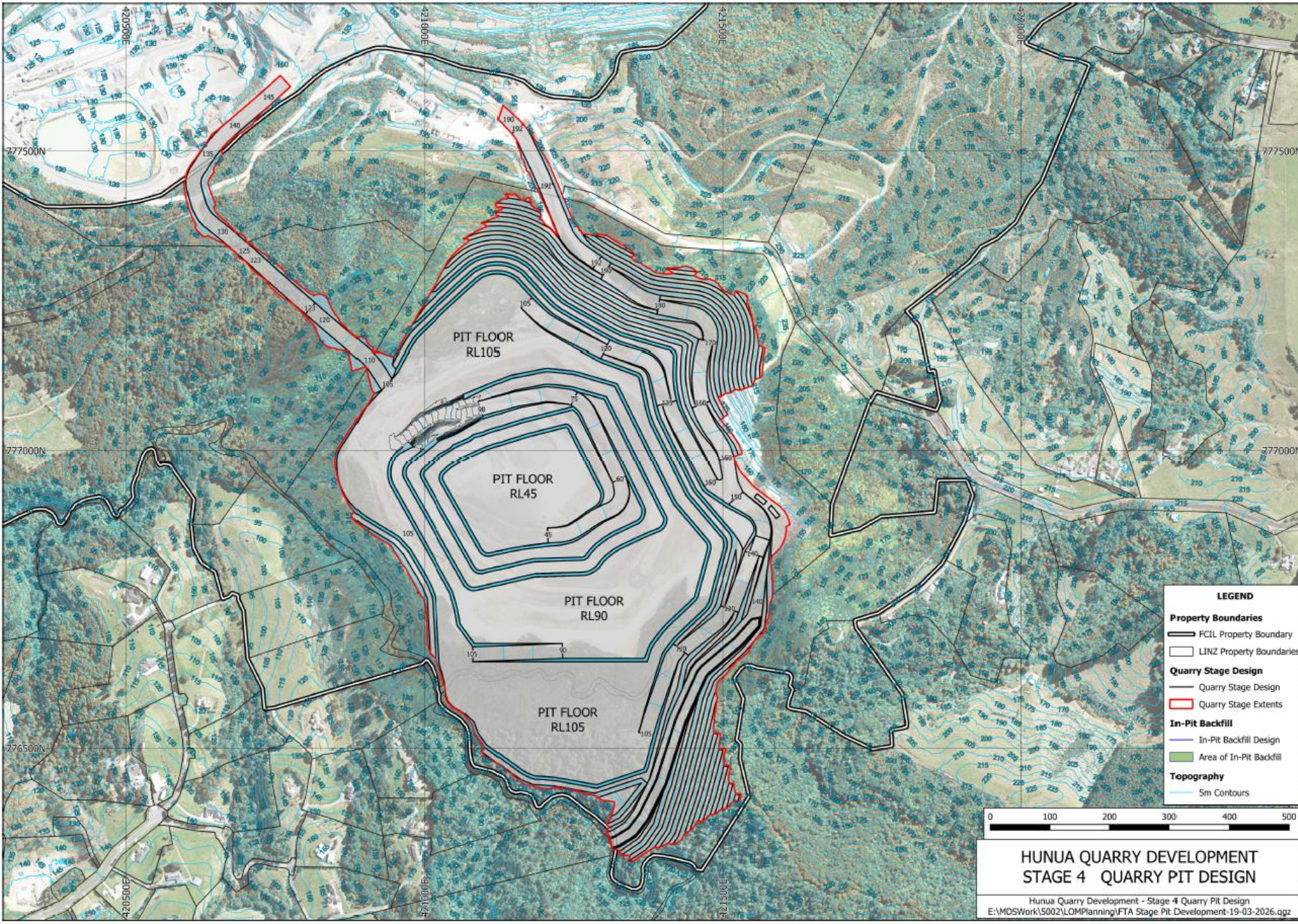
Stage 2



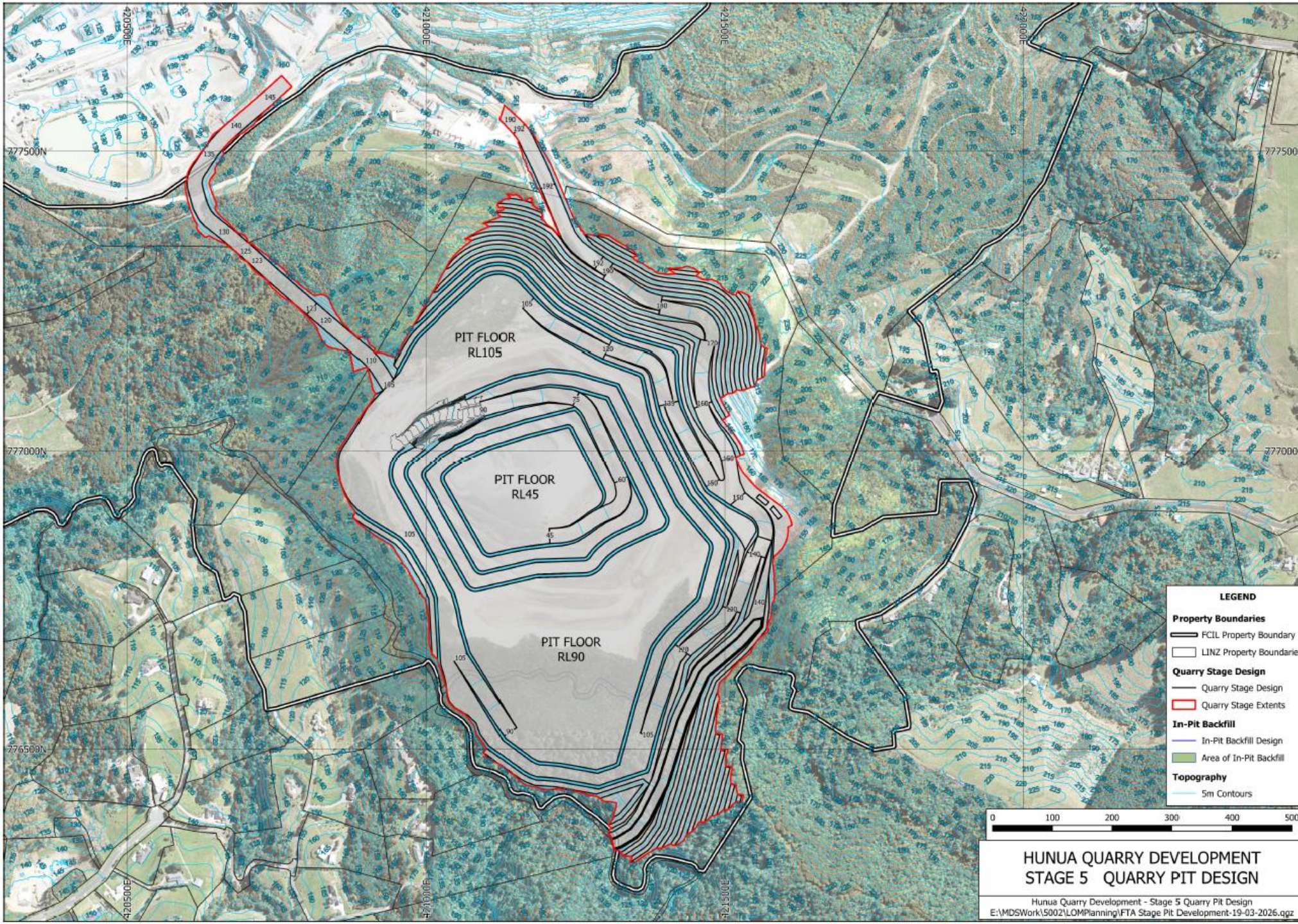
Stage 3



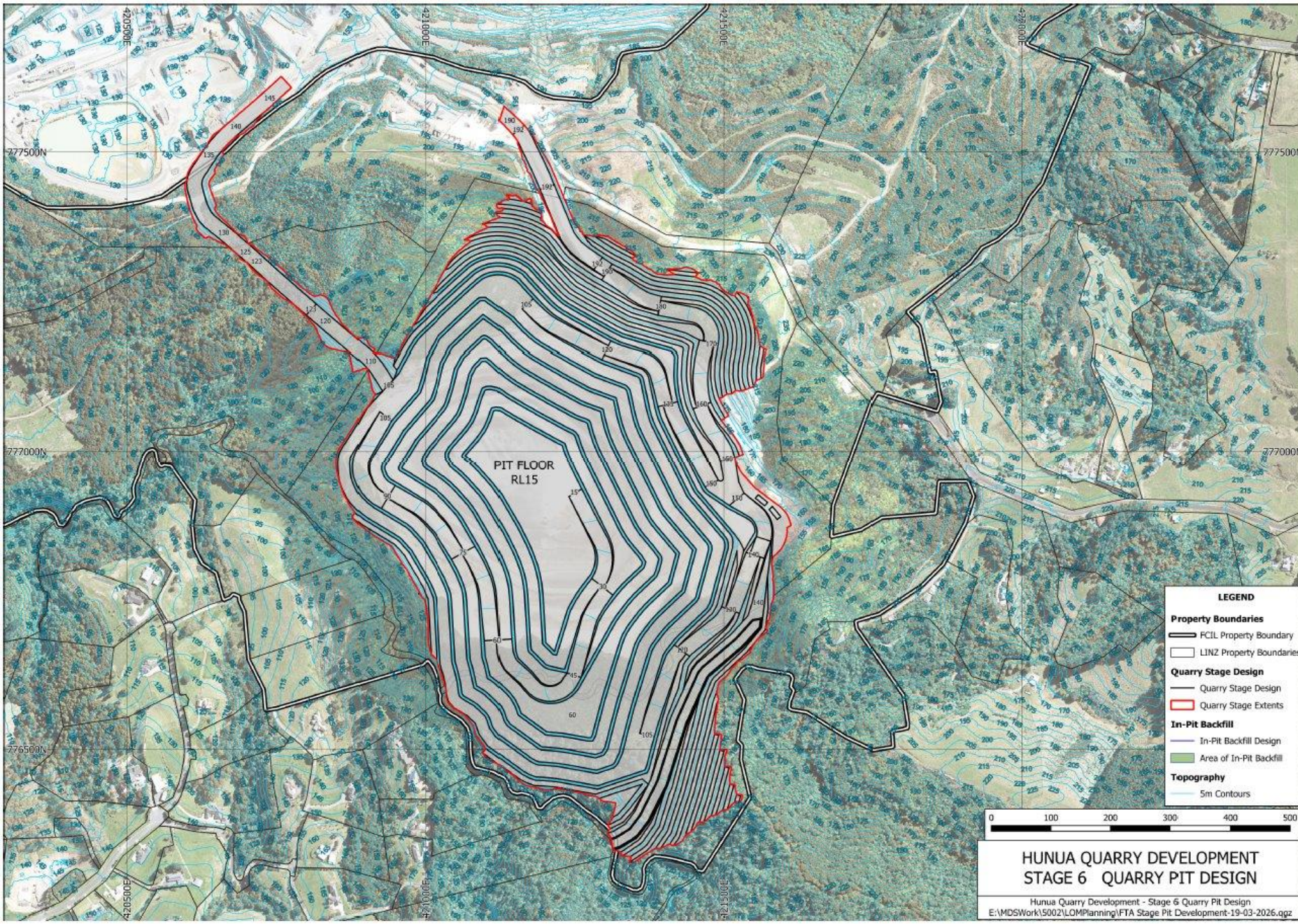
Stage 4



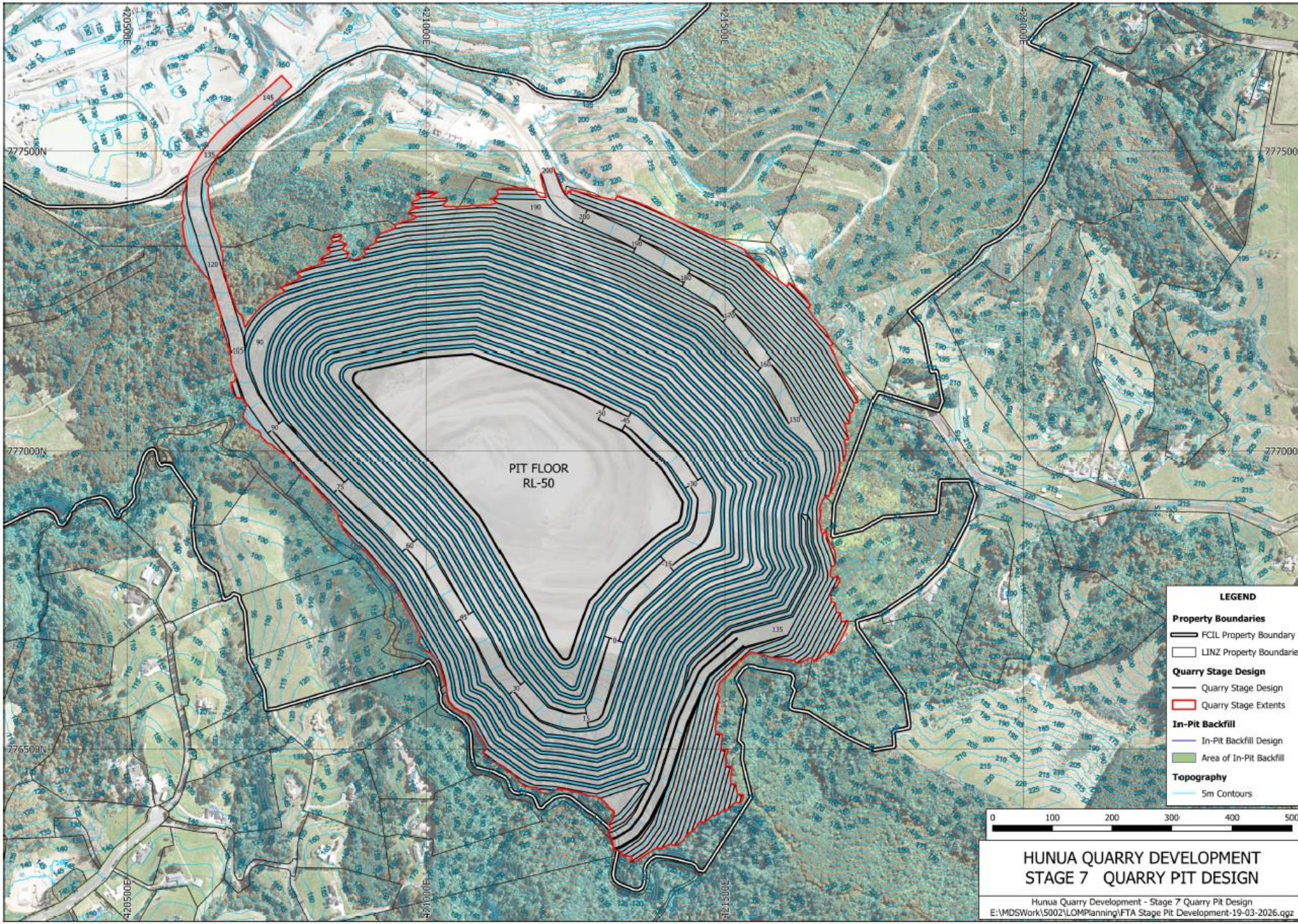
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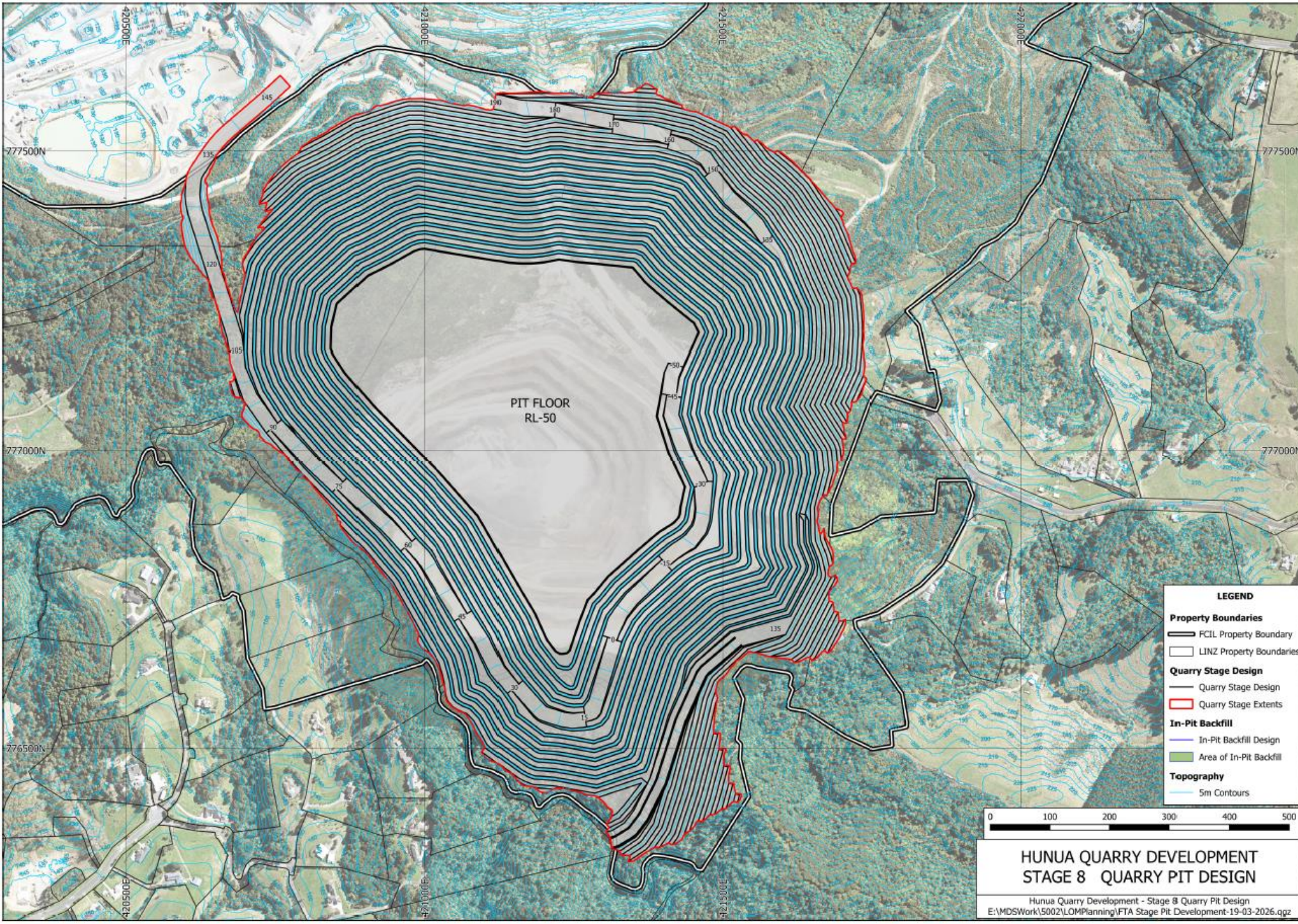
Stage 6



Stage 7



Stage 8



An aerial photograph of a landscape. In the foreground and middle ground, there is a large, dense forest of green trees. To the right of the forest, there is a large, circular, terraced quarry or excavation site with exposed earth and rock. In the background, there are rolling green hills with scattered houses and buildings, suggesting a rural or semi-rural area. The sky is not visible, and the overall lighting is soft, possibly from the early morning or late afternoon.

Planning Assessment

Consent Background

- Hunua Quarry currently operates under an established suite of consents that authorise extraction from the existing Hunua Pit and Symonds Hill Pit and processing at the processing site.
- The project builds on this existing framework by:
 - retaining certain existing approvals;
 - seeking variations to some existing approvals; and
 - seeking new or replacement “global” consents.



Consented baseline and changes required

Existing consented activities	Consented activities	New activities within the consented Symonds Hill Pit	New activities outside the consented Symonds Hill Pit
Approximately 3million m3 of managed fill to rehabilitate the Hunua Pit to RL170m.	No change	New consent required for in-pit placement of overburden within Symonds Hill Pit , when required.	
Discharges from managed fill including disposal of water (perched groundwater and collected stormwater).	Retain for Hunua Pit.	Covered by ‘usual’ discharge consents as backfilling only.	
To construct a new sediment detention pond and discharge point to nearby watercourse within the Special Purpose – Quarry Zone.	No change	New consent required for new detention ponds and discharge points to Mangapū Stream, due to redesign of the quarry pit.	
Groundwater take and diversion for Hunua Pit and Symonds Hill Pit dewatering and stream flow augmentation	New global groundwater diversion and take consent to be sought to: - remove takes related to Hunua Pit. - Amend Symonds Hill Pit figures to reflect proposed take and augmentation. WAT60152106 – A will be relinquished once a new consent has been issued.		
Groundwater diversion to quarry pit dewatering pond. Stormwater / groundwater takes for dewatering and quarry use	This consent will be rolled into the new global groundwater diversion and take consent as discussed above. WAT60274802-A will be relinquished once a new consent has been issued.		
Discharge of groundwater and surface water from a quarry pit to the Mangapū Stream.	A new consent is required to provide for a new discharge point once the stream diversion works have been completed.		
Symonds Pit Air discharge	A new global air discharge consent for outside consented areas / operations		
Symonds Pit: removal of 400m of Mangapū Stream tributary.	No change – works completed.		New consent required for diversion of different section of Mangapū Stream tributary 1 (Stage 1) and reclamation of channel bed; culverts and a temporary bridge .
Symonds Pit: Sediment control at Hunua Pit – covers development area	New global consent is being sought to obtain a 35-year consent duration.		
Symonds Pit: Vegetation removal including revegetation and covenants	S127 to replace outdated conditions		New consent will be sought for all vegetation removal outside the consented pit.



Boffa Miskell
www.boffamiskell.co.nz

This plan has been prepared by Boffa Miskell Limited on the instructions of our Client, in accordance with the agreed scope of work. It is intended to support an application under the Resource Management Act 1991. It may be relied upon by the Client and other interested parties for the purposes of assessing the application. While Boffa Miskell Limited has exercised due care in preparing this plan, it does not accept liability for any use of the plan beyond its intended purpose. Where information has been supplied by the Client or obtained from external sources, it has been assumed to be accurate unless otherwise stated.

Scale Sources: LINZ (Aerial 02/2020, Planets, Roads), Winstone Aggregates, BMA.
Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND
The Site
Quarry Development Area
Stockyard and Processing Area
Hunua Overburden Disposal Area and Managed Fill
Land Parcels

HUNUA QUARRY DEVELOPMENT
Existing Quarry Operations

Date: 27 March 2020 | Revision: 0
Plan prepared by Boffa Miskell Limited
Project Manager: Nick Pollard@boffamiskell.co.nz | Drawn: SGA | Checked: NPO

Figure 6

Approvals

- **All necessary approvals are being sought under the Fast-track Approvals Act 2024:**
 - 'Hunua Quarry Development' is a listed project under Schedule 2 of the FTAA
- **Resource Consents** to enable development of quarrying activities at Symonds Hill Pit under Section 42(4)(a) of the FTAA
 - Resource consent is required for, but not limited to, the diversion of the Mangapū tributary, vegetation removal and earthworks
 - Quarry Development Area extends from the Special Purpose Quarry Zone in to Mixed Rural Zone
- **Wildlife Approval** for the salvage and relocation of native lizards under Section 42(4)(h) of the FTAA
- **Archaeological Authority** as a precaution under Section 42(4)(i) of the FTAA
- **Complex Freshwater Fisheries Approval** for the diversion of the Mangapū tributary (including a temporary weir); culverts blocking fish passage; and fish salvage activities under Section 42(4)(j) of the FTAA

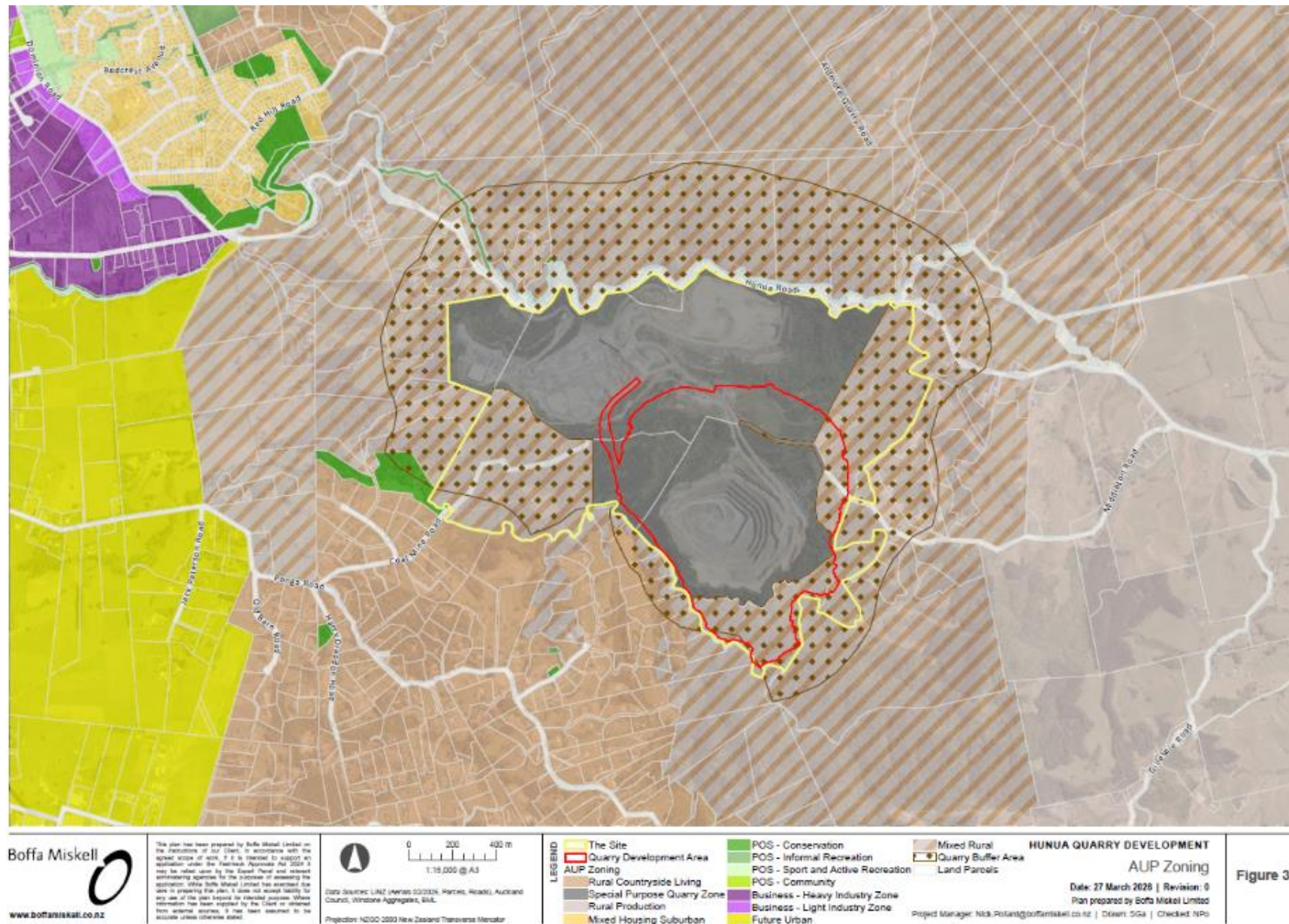


Figure 3

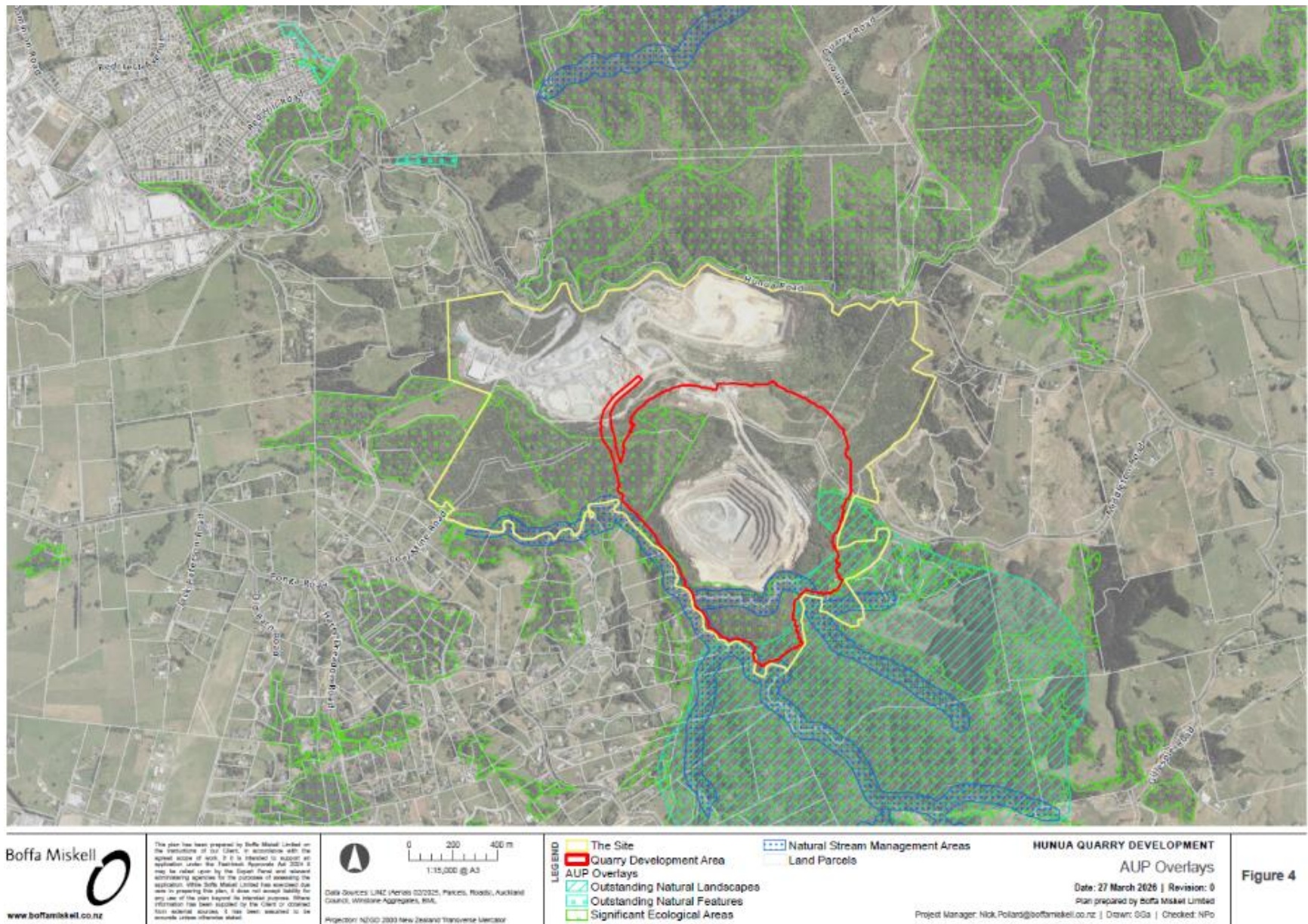


Figure 4

Consenting strategy (planning lens)



- Ensure the proposal is **aligned with the FTAA listing** including scope, extent, objectives and expectations.
- Confirm the **consents / approvals necessary to authorise the proposal** including any existing consents that need to be varied or extended along with any that are to be superseded / surrendered.
- Develop the **project description and identify the potential effects** and test these with the experts to determine if there are **unacceptable levels** or **bottomlines** that could be breached.
- Work with experts to **identify effects on the environment and on parties** that need to be engaged with as part of developing a strategy to manage adverse effects including avoidance, mitigation, compensatory and offsetting measures.
- Quantify the national / regional benefits and **weigh the adverse impacts** to ensure that they are not out of proportion with those benefits.
- Develop a suite of consent conditions and management plans that manage the potential effects to appropriate levels.

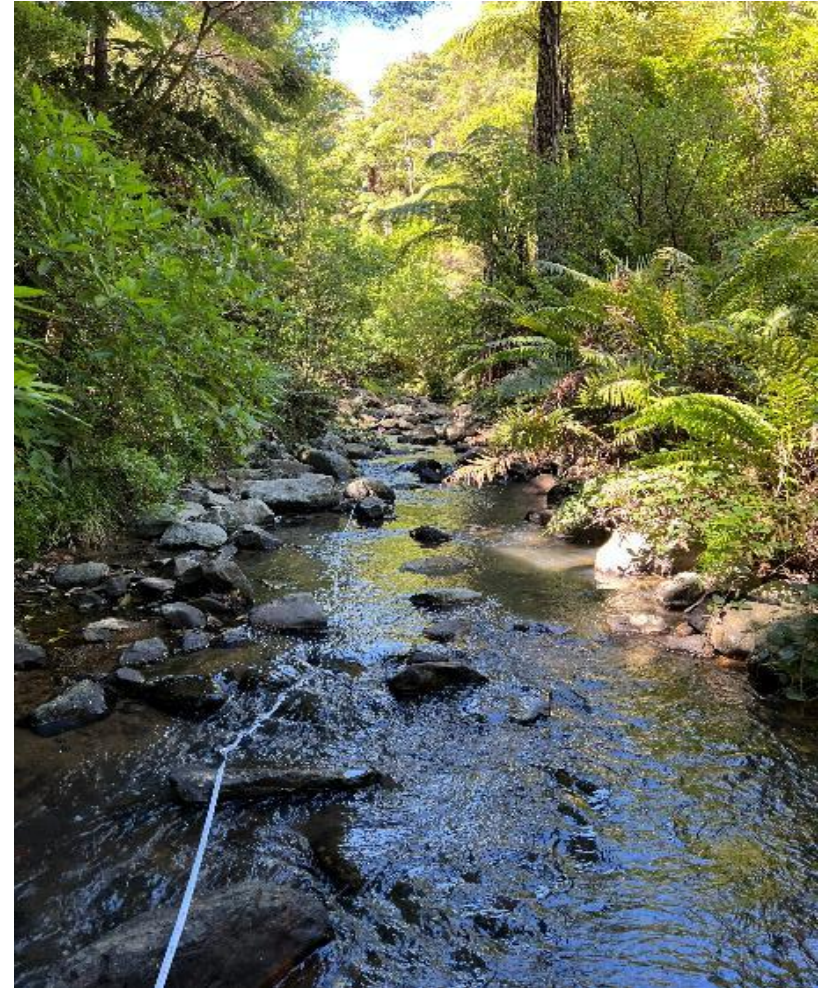
Statutory Framework

- Fast Track Approvals Act 2024
- Resource Management Act 1991
- National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health 2011
- National Environmental Standards for Freshwater 2020
- National Environmental Standard for Air Quality 2011
- Resource Management (Measurement and Reporting of Water Takes) Regulations 2010
- National Policy Statement for Infrastructure 2025
- National Policy Statement for Freshwater Management 2020
- National Policy Statement for Indigenous Biodiversity 2022
- Auckland Unitary Plan

- The project unlocks considerable additional resource and provides significant regional benefits.
- Mineral extraction activities are recognised as a typical feature of the identified rural zones including the Mixed Rural zone and the proposal is still located within the Quarry Buffer Overlay.
- Mineral extraction is supported provided environmental effects are appropriately managed, including impacts such as noise, dust, visual effects, traffic, and ecological disturbance.
- Effects management hierarchy has been applied: extensive mitigation is provided where effects cannot be avoided; a comprehensive ecological offset and compensation package has been prepared to offset and compensate for any adverse effects on the environment.
- Demonstrable functional and operational need.

Functional and Operational Need

- There is a functional need for the quarrying activity to extend into the southern portion of the site due to the location of access to the aggregate resource, in particular, high-quality greywacke.
- There is an operational need for the construction of the western haul road to improve and enable access to existing infrastructure that has been established for many years, rather than relocating or re-establishing the equipment elsewhere.
- Overall, it is necessary to carry out vegetation clearance, wetland drainage and stream diversion where the aggregate resource is located to allow access and quarrying in this area.



Effects of the proposal



People

- Cultural
- Economics

Environmental

- Ecological
- Landscape & Visual effects
- Archaeological and Heritage Values
- Stream realignment
- Contamination

Operational

- Transportation
- Dust
- Groundwater and surface water
- Geotechnical
- Noise and vibration

Consultation

Administering Agencies and Local Authorities

- Consultation included site visits, meetings and ongoing emails.
- Informed parts of the project including the ecological offset site, technical matters, and site entry upgrades.

Mana Whenua

- Winstone have maintained a long ongoing relationship with Ngāti Tamaoho, Te Ākitai Waiohua, Ngāti Tai and Ngāti Te Ata as part of the ongoing operations at Hunua Quarry.
- Notification letters were provided to additional iwi on 23 February 2026.
- Ongoing engagement with iwi and hapū included hui, workshops, site visits, and continuous communication throughout the project.

Local Community and Neighbours

- Consultation with local community, landowners, and bore holders helped shape project design.
- Consultation was undertaken through door knocking, letters and 1:1 meetings held with landowners and bore owners.

Conditions

- Capture the key mitigation measures and management plans addressed in the specialist reports and assessment of effects.
- Provide certainty that environmental issues can be appropriately managed and effects on the environment will be avoided, remedied, mitigated, offset or compensated.
- The conditions establish enforceable performance standards and environmental limits, while management plans provide detail on how those standards will be achieved and complied with, particularly for operational matters.



Conditions Structure

Nine parts to the conditions – structured broadly by specialist area and organised to ensure they are clear for operational staff to implement.

- **Part B** – Conditions Applying to All Consents
- **Part C** – Specific Conditions - Construction Works and Mineral Extraction
- **Part D** – Specific Conditions - Air Discharge Permit (S15 RMA)
- **Part E** – Specific Conditions - Groundwater Permits (S14 RMA)
- **Part F** – Subdivision Consent Conditions
- **Part G** – Changes to Conditions of Resource Consent 8730
- **Part H** – Archaeological Authority Conditions
- **Part I** – Wildlife Permit Conditions
- **Part J** – Complex Freshwater Fisheries Activity Approval Conditions

Management Plans

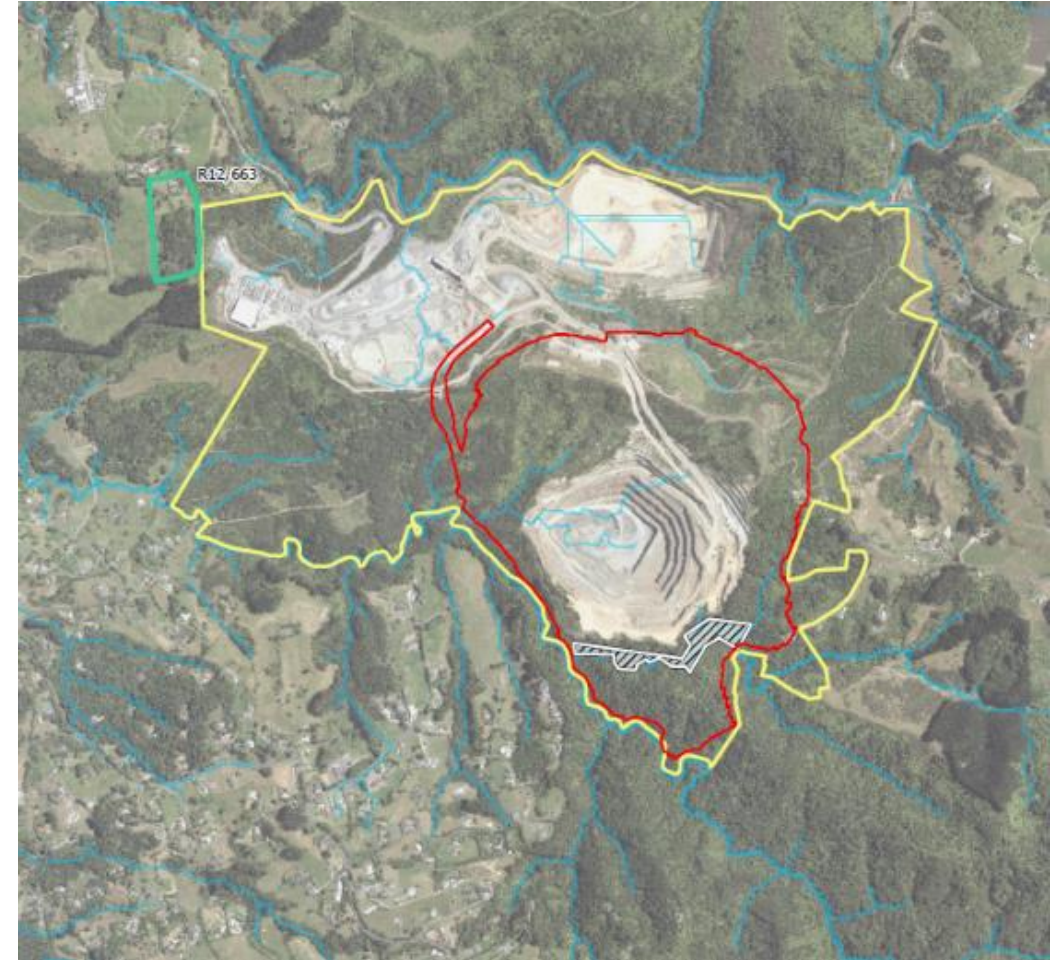
- Management Plans are intended to provide details to Council on how the potential effects of construction and ongoing quarrying activities will be managed.
- Management plans, where required, have been prepared upfront and submitted with the application where the relevant information is available and the proposed measures set out in those plans will be consistent and applicable across the Site.
- Other management plans relating to later works will be submitted to Council for certification at least 20 working days prior to commencement of relevant works (e.g. prior to the commencement of Stage 7 and 8).
- Management plan conditions 22-35 (Part B) provide a process for certification of new or amended Management Plans by Auckland Council.

Management Plans

- Quarry Management Plan
- Operational Noise Management Plan
- Contaminated Site Management Plan
- Erosion and Sediment Control Plan
- Chemical Treatment Management Plan
- Air Quality Management Plan
- Groundwater Monitoring and Contingency Management Plan
- Water Quality Monitoring and Management Plan
- Trigger Action Response Plan
- Landscape Rehabilitation Strategy and Management Plan
- Ecology Management Plan
- Aquatic Fauna Salvage and Relocation Plan
- Lizard Management plan
- Pest Management Plan
- Stream Realignment Management Plan

Archaeological Approval

- There are no recorded archaeological sites within the Site.
- R12/663 (green outline) is located adjacent to the site on the northwest boundary.
- Precautionary Archaeological Authority is being sought across the Quarry Development Area (red outline).
- Archaeological monitoring is required along the Mangapū tributary (white hatched area).



Effects of the project

The proposal seeks to increase the annual quarry production of Hunua Quarry from 2,943,052 tonnes to a peak of approximately 5,400,000 tonnes of aggregate as well as to enable the extraction for up to 80 years.

The Quarry will continue to utilise the existing access from Hunua Road, although this is proposed to be upgraded to ensure the safe operation of the access for turning trucks and other road users.

Key transport changes of the proposal:

- Truck numbers are based on demand. For much of the time truck numbers will be similar to existing and based on demand, however an increase has been allowed for
- Likely peak truck increase of approximately 111% from average 2023 truck numbers
- AM peak hour – 161 truck movements (increase by 86 from existing);
- PM peak hour – 135 truck movements (increase by 72 from existing)
- Staff number expected to be unchanged

Key conclusions:

- **No significant safety issues have been identified in the surrounding area**
- **There is sufficient capacity to accommodate the proposed increase in truck volumes. The Hunua Road / Settlement Road intersection (key intersection in the area) can accommodate the increased volumes, therefore considered acceptable from a transport perspective**
- **The internal haul roads are closed to public, built for quarry trucks and are not subject to specific Unitary Plan rules**
- **It has been identified that with the heavy vehicles accommodated by the access the existing access point requires an upgrade to include a full right turn bay**

Single issue in dispute

The concern raised by Auckland Transport (AT):

Two serious crashes over the least 5 years involving trucks have occurred at a bend some 1km west of the site. AT consider the two similar crashes of the same type at the same location represent the beginning of an identifiable pattern and additional mitigation should be provided by the applicant potentially including benching of the cut slope on the inside of the curve.

Not a trend:

A revised CAS search has been conducted assessing crashes over the last 10 years. No additional crashes involving trucks have occurred at the specified location during the 10 year period (2016-2026). I consider this highlights that there is not a trend.

Driver behavior:

Both crashes were **not** caused by the truck but rather a westbound passenger vehicle approaching the corner, and crossing the centre line and colliding with an oncoming vehicle (which just happened to be a truck).

Proposed mitigation

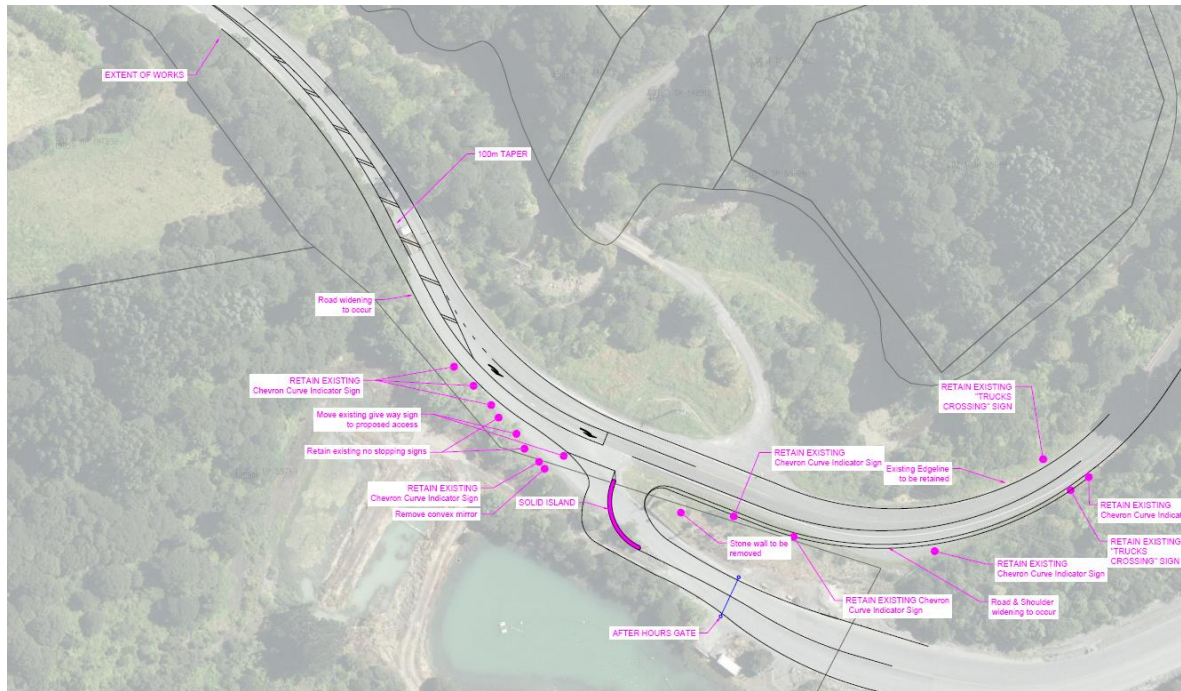
Although I do not consider two crashes over a five year period a trend, additional Audio-Tactile Pavement (ATP) markings rumble strips along the centreline of the corner could be included discourage drivers from crossing the centreline causing the head on collisions. In my opinion, while theses are not specifically needed from an effects perspective relating to the increase in truck movements, I understand the applicant is prepared to offer them as a show of good faith to improve safety in the area.

In my opinion, Auckland Transport's proposed solution including benching of the slope on the inside of the curve to improve sight lines:

- Does not address the actual cause of the crashes and therefore will not materially change the situation; and
- Is not the responsibility of the applicant as trucks are not the cause of the crashes.

Managing the traffic effects

The upgraded access mitigates current deficiency and delivers measurable safety and operational improvements for all road users on Hunua Road. With this upgrade the proposal, is considered to result in a **net positive gain for the local transport network** and additionally, the increase in truck volumes is **not anticipated to adversely impact on the safe or operation of the wider transport network**.



Improvements

- ✓ **90° geometry:** squared-up access removes skew, improved sightlines and slows trucks exiting the site
- ✓ **Dedicated right-turn bay:** deceleration and stacking lane keeps trucks separated from Hunua Road traffic
- ✓ **Splitter island:** physically separates inbound and outbound movements and restricts trucks cutting across the access
- ✓ **50 m gate setback:** Queue entirely on-site and eliminates potential queuing on Hunua Road
- ✓ **Sealed access + shoulder widening:** ensures debris not carried onto Hunua Road

Existing Scenario

📌 **Site:** The Hunua Quarry is located at 489 Hunua Road, Hunua approximately 5km southeast of Papakura. The Hunua Quarry has been operating since the 1920's and supplies approximately 2,943,052 tonnes of aggregate per annum which is a significant portion of Auckland's aggregate requirements. There are currently no specific planning controls on vehicle numbers in/out of the quarry

📌 **Road environment:** The site has access via Hunua Road. Hunua Road to the west of the site (used by trucks) is part of the Auckland Strategic Freight network (which extends to the southern motorway) and carries approximately 3,558 vpd with 21% heavy vehicles, 60 km/h posted speed and approx 7.5 m sealed width which has been upgraded to cater for trucks over a number of years

➡️ **Existing access:** Access occurs via a single entry/exit point for two-way truck movements. This access has a rather skewed geometry (not perpendicular to Hunua Road) and no right-turn bay from Hunua Road into site





Hunua Quarry Expansion: Economic Benefits Assessment



Presented by

Greg Akehurst

Date: 8-Jul-2026

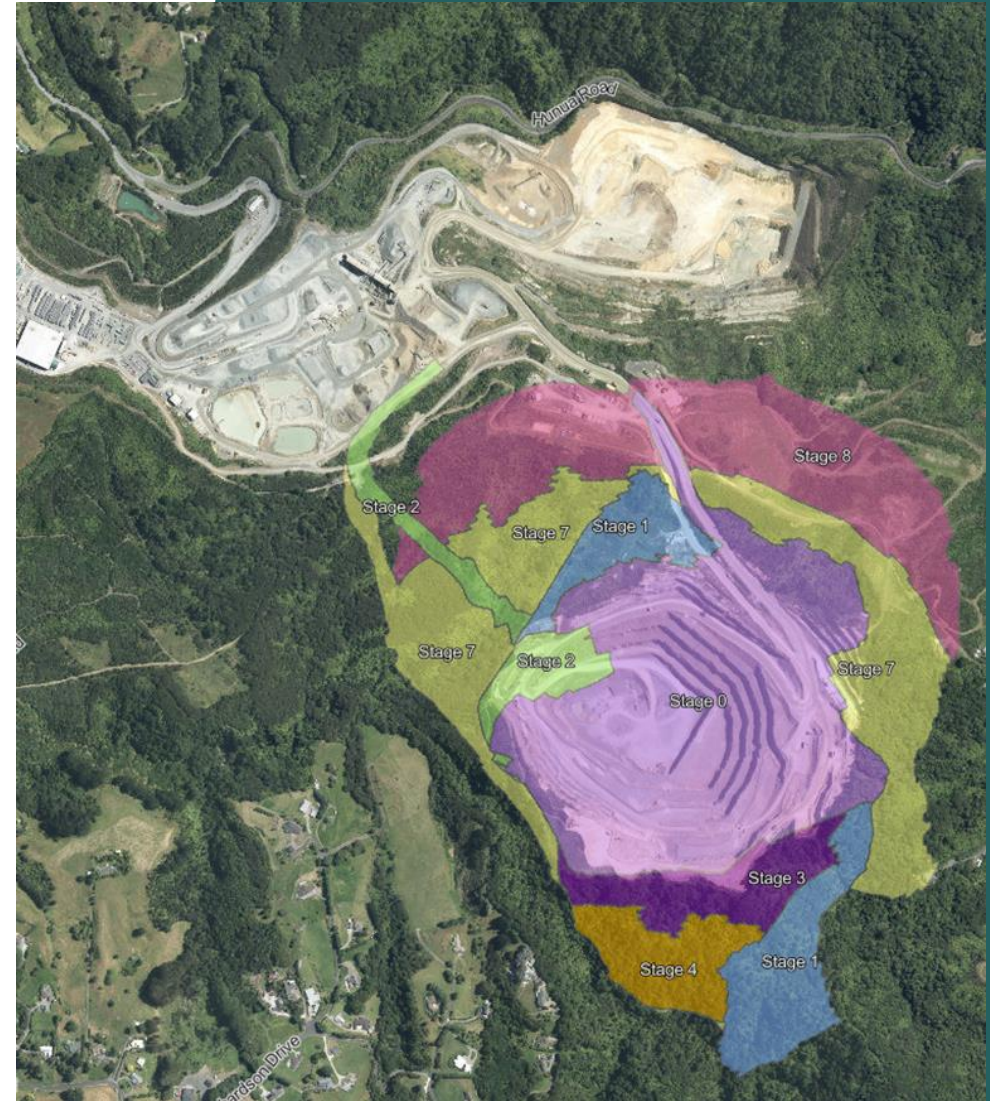
Economics – Background

- Hunua Quarry plays a key role in meeting Auckland's aggregate needs
- Auckland is in aggregate deficit – at least last 15 years.
- Auckland is growing rapidly – 40%-50% of total national growth (+25,000pop/ann.).
- Auckland Aggregate shortfall will exacerbate unless new supply is consented (from 2.1mt to 6.2mt - 9.0mt by 2055)
- Loss of Hunua production increases housing costs, greenhouse gas emissions, economic and social costs.



The Project

- The project is a listed project under the FTAA 2024
- Allows the existing quarry to increase production from 2.7mt to 5.4mt annually
- Allows production to extend to up to 80 years into the future.
- Allows continuation and development of a substantial existing business.
- Secures a key Auckland Regional resource to enable future growth.



Economic Benefits of the Project

Three broad areas of benefit:

- Associated with expenditure to extend the quarry.
- Associated with the continuation of Hunua Quarry as an existing business and aggregate value.
- Associated with a range of avoided costs for the Auckland economy.

Construction Effects (\$m, PV_{8%})

Region	Direct	Indirect	Induced	Total
Auckland	68.9	33	29.8	131.7
Rest of North Island	0	5.8	6.6	12.4
Rest of NZ	0	3.1	2.8	5.9
Total New Zealand	68.9	41.9	39.2	150

Quarry as business and Resource value

Category	Value
Hunua Quarry as a business today	\$65m
Hunua Quarry @ 3.3m tonnes (high future)	\$80m
Total Aggregate Resource Value at current prices	\$5.4bn

Avoided Costs (\$m, PV_{5%})

Cost Category	Low	Mid	High
Transport Savings	\$467	\$478	\$600
Social Cost Savings	\$20	\$20	\$25
Emission Cost Savings	\$177	\$180	\$228
Total Benefits	\$663	\$677	\$853

Qualitative Benefits and Economic Costs

- A range of additional non monetised qualitative benefits
 - **Supply chain resilience.**
 - **Competitive market effects.**
 - **Business continuity and operational maturity.**
 - **Housing and infrastructure delivery.**
- Economic Costs
 - Opportunity costs of the spend to extend quarry
 - Impacts on immediate neighbours – noise, dust, vibration
 - Indigenous bio-diversity – quarry push into forest.
- Economic costs are assessed as small – relative to significant economic benefits

Economics - Summary and Conclusions

Construction Effects and Benefits

Direct contribution to Auckland GDP \$69m (2,439 worker years)

Total contribution to Auckland GDP \$131m (4,532 worker years direct + indirect)

Mostly benefits accrue to Auckland Region but \$18m GDP to RoNZ.

Avoided Cost Benefits – Transport, Emissions, Social

Direct avoided effects – 3 production scenarios, alt. source - Smythes Quarry (PV_{5%})

Low \$663m

Med \$677m

High \$853m

If aggregate sourced from another quarry, these costs rise significantly.

Conclusions

Economic Costs are very low relative to benefits

Avoided costs = benefits and are high

Qualitative benefits – supply chain resilience, competitive markets, housing and infrastructure delivery.

Overall project delivers significant regional and national economic benefits

Landscape Context

Outstanding Natural Landscape overlay

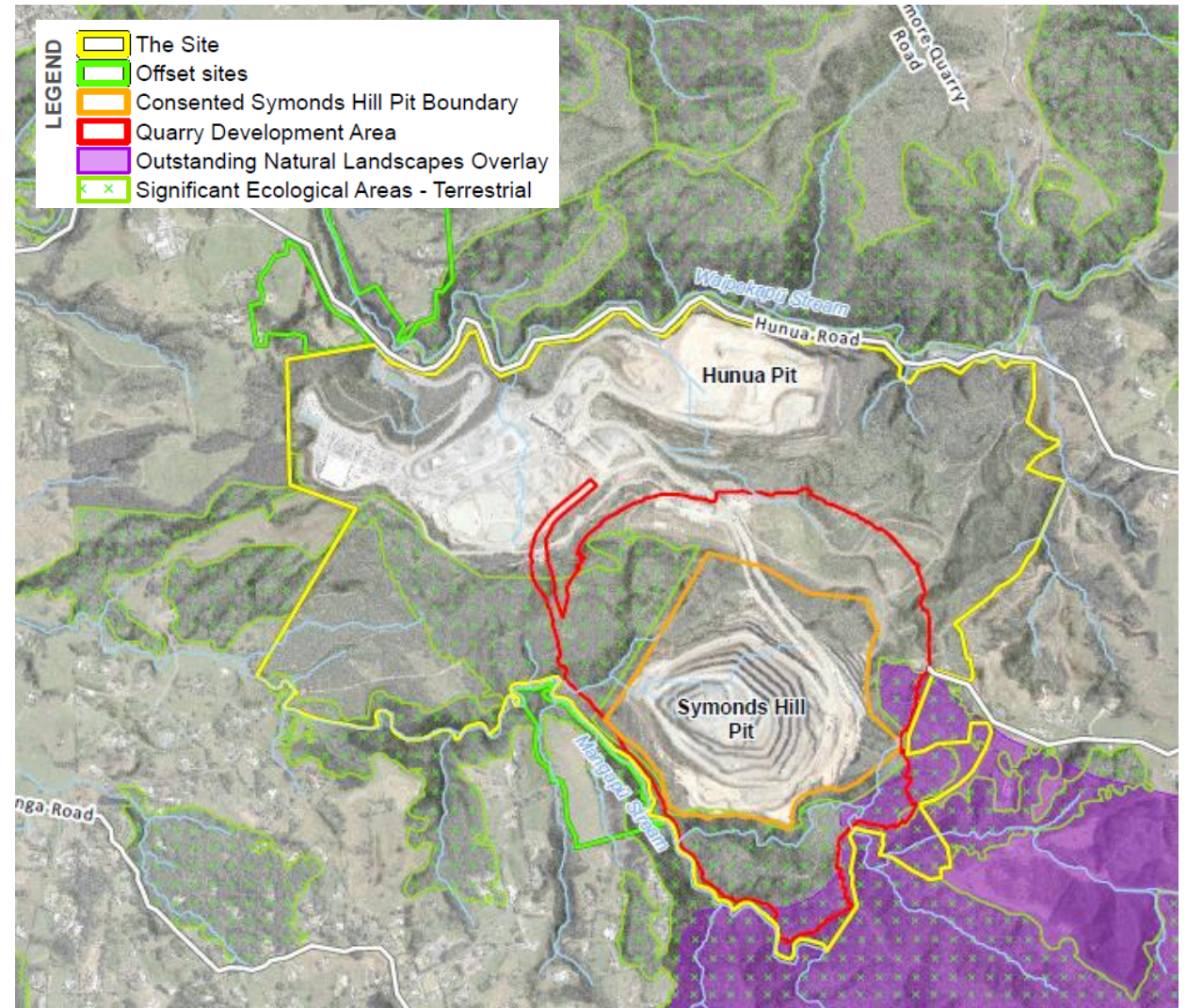
- The southern extent of the Site is subject to the Ponga Road (ID 60) ONL overlay. Of the overall 394ha Ponga Road ONL, 6ha or approximately 1.5% is located within the quarry development area.
- The ONL overlay relates to an extensive sequence of mature and regenerating indigenous forest, combined with strongly articulated stream corridors that reinforce the natural qualities of this rolling to dissected hill country landscape.

Significant Ecological Areas

- The Site has extensive indigenous vegetation cover, which is recognised as a Significant Ecological Area. In the northern area, it is dominated by kauri, podocarp, and broadleaved forest, interspersed with tree ferns, mature kānuka, and early successional broadleaf species. In the southern area, indigenous vegetation primarily comprises taraire, tawa, and podocarp forests.

Cultural Significance

- The Otūwairoa Stream and its tributaries (including the Mangapū Stream) are within a recognised statutory acknowledgement.



AUP Overlays

Landscape Effects

- The Project will result in adverse landscape effects throughout Stages 1 – 8. These effects relate to extensive landform excavation, removal of ridges and hillslopes, realignment of the Mangapū Stream Tributary, and progressive loss of 44.46ha of indigenous vegetation across the active footprint, including areas within the ONL.
- There are limited mitigation options available on the Site.
- Over the long term, **progressive rehabilitation**, including indigenous riparian planting of Mangapū Stream Tributary, **rehabilitation of benches and the Hunua Pit OBDA** with native planting, as well as native revegetation across the **offset sites**, will gradually soften engineered landforms and re-establish natural vegetation patterns around the quarry margins as part of a broader cohesive vegetated backdrop and work to protect the defining values of the Ponga Road ONL.
- With successful establishment, these measures are **expected to reduce the landscape effects over time**.



Landscape Mitigation Planting

The proposed mitigation and offset plantings will be established across designated offset sites within the Winstone landholding the first planting season following construction of Stage 1. These plantings will comprise a diverse mix of native species that are characteristic of, and currently present within, the Significant Ecological Area (SEA_T_5323).

- LEGEND
- The Site
-
- Offset sites

Proposed Native Revegetation Areas

- Mitigation/Offset Planting Areas
- Hunua Pit OBDA Planting Area
- Rehabilitation Planting Areas
- Symonds Hill Pit OBDA



Landscape Rehabilitation Strategy

PHASES OF REHABILITATION

The following images illustrate the quarry development stages in 3D as they progress over the life of the quarry and their relationship to the phases of rehabilitation.

STAGES OF THE QUARRY DEVELOPMENT

LEGEND

Stage 0 (consented)

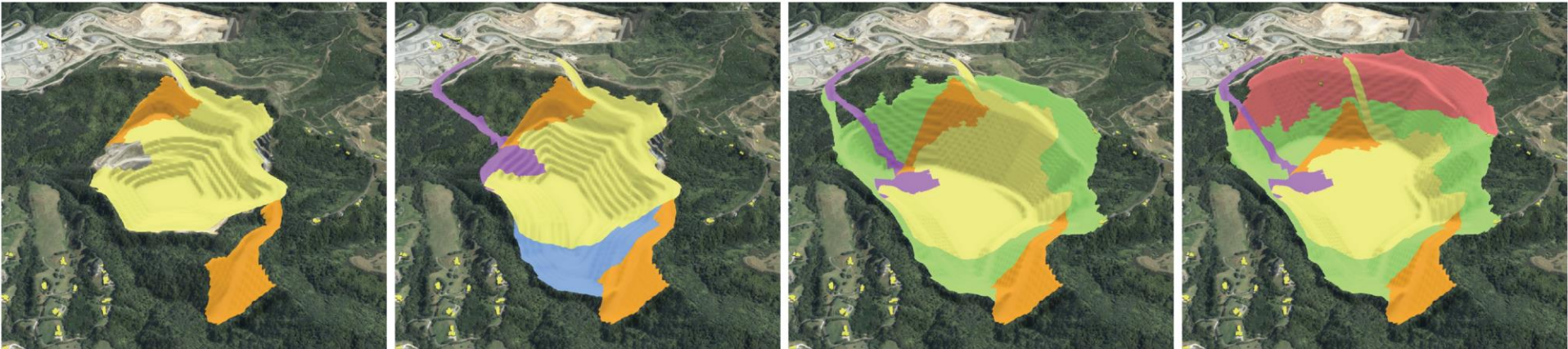
Stage 1

Stage 2

Stage 6

Stage 7

Stage 8



STAGE 1

STAGE 6

STAGE 7

STAGE 8

PHASES OF REHABILITATION



PHASE 1

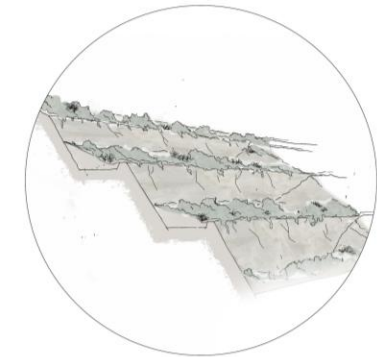
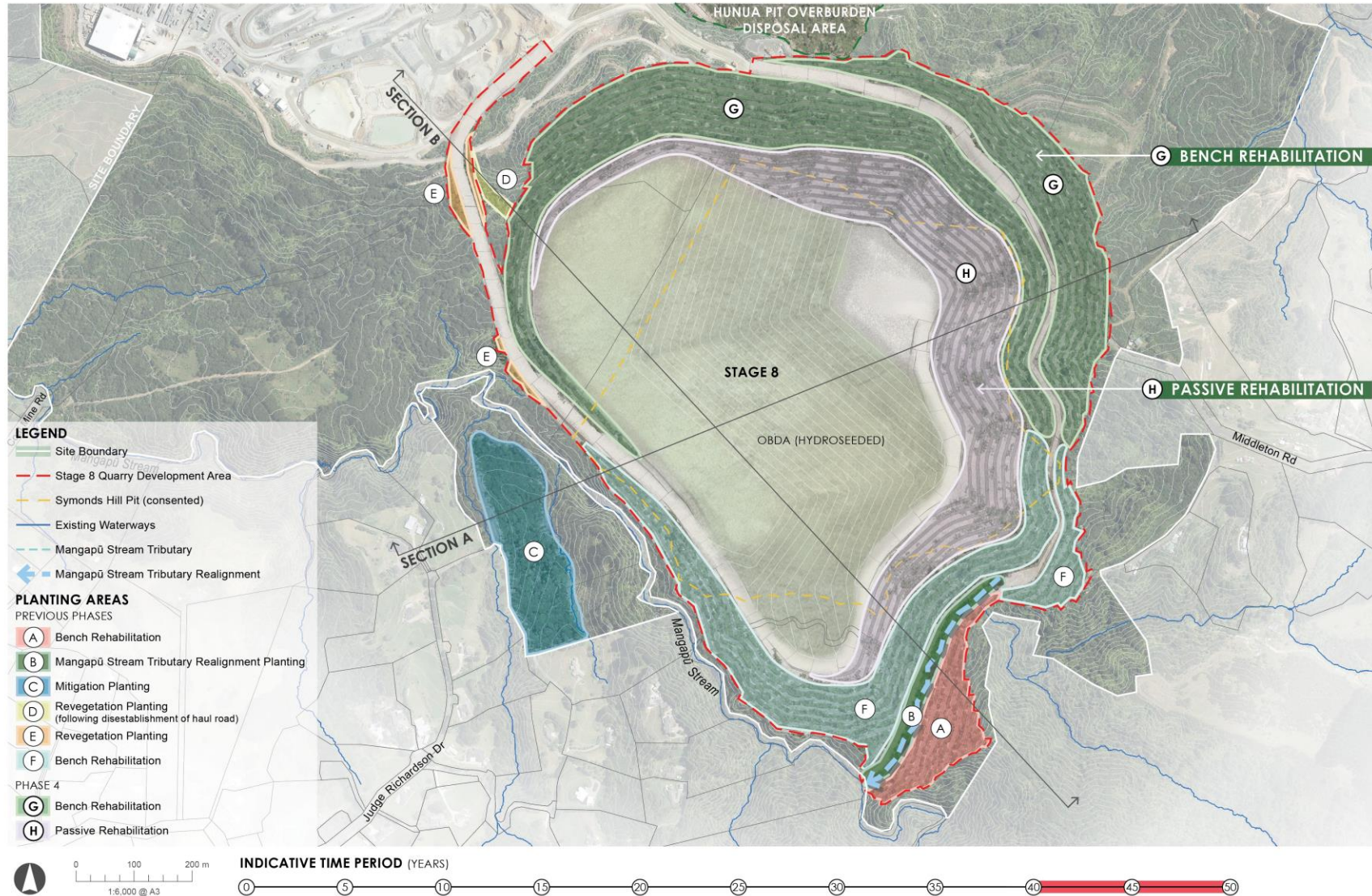
PHASE 2

PHASE 3

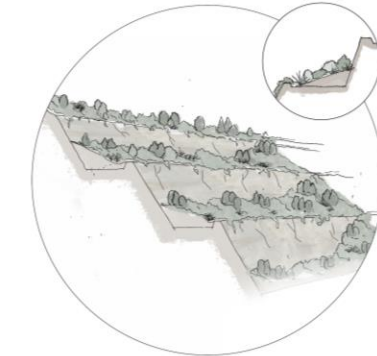
PHASE 4

Landscape Rehabilitation

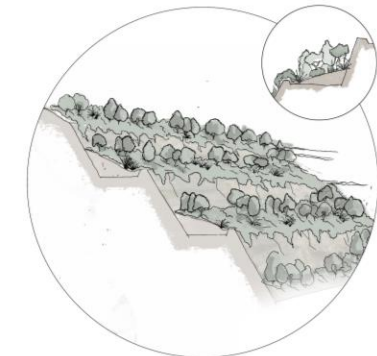
PHASE 4 SYMONDS HILL PIT REHABILITATION PLAN



ESTABLISHMENT PHASE



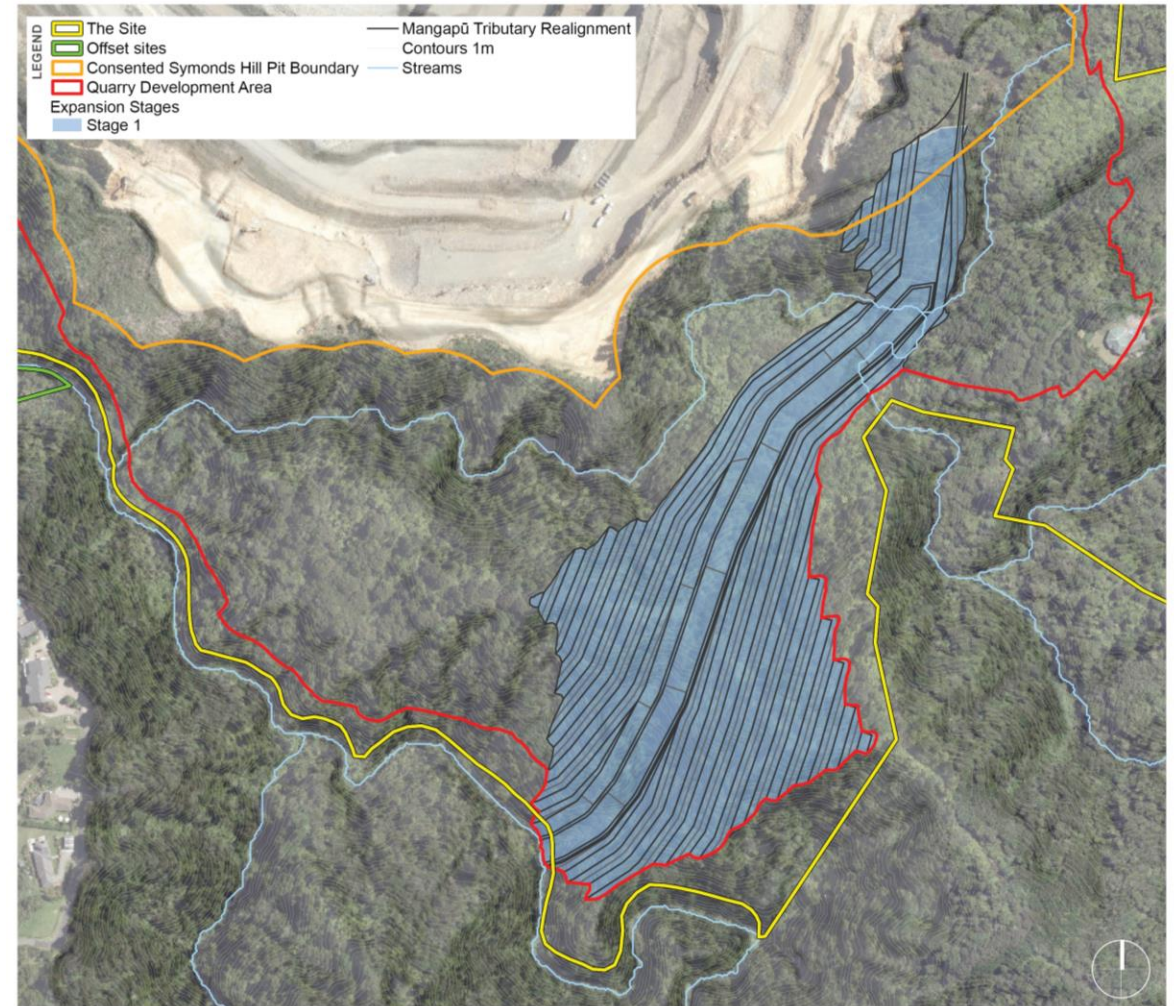
YEAR 10



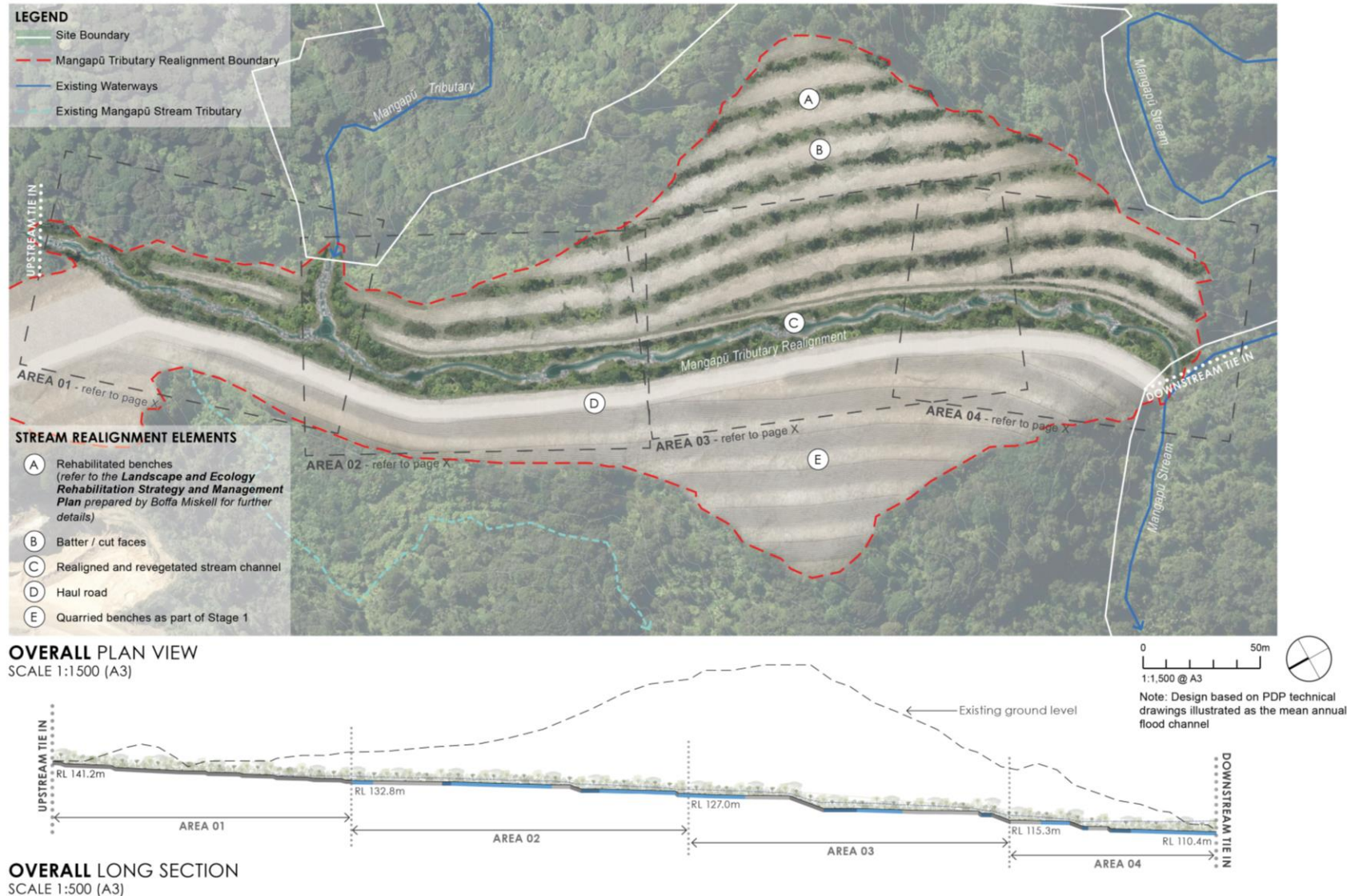
YEAR 35

Natural Character Effects

- At the Site scale, the Project inevitably results in the loss of the existing natural character associated with the lower reach of the Mangapū Stream Tributary, due to the scale of modification required.
- While the level of modification required and the scale of disruption to the existing stream system represent a fundamental alteration of the natural environment along and surrounding the tributary, the **overall natural character of the stream system is expected to be progressively restored over time** as the new channel stabilises and riparian vegetation establishes. **The stream realignment is the primary mitigation measure and is intended to progressively reduce the ‘high’ adverse effects down to ‘moderate-high’ and eventually to ‘moderate’ over time.**
- The degree to which natural character can ultimately be restored is dependent and directly tied to the success of the realignment design, implementation and long-term management approach.



Stream Realignment Mitigation



Stream Realignment Mitigation

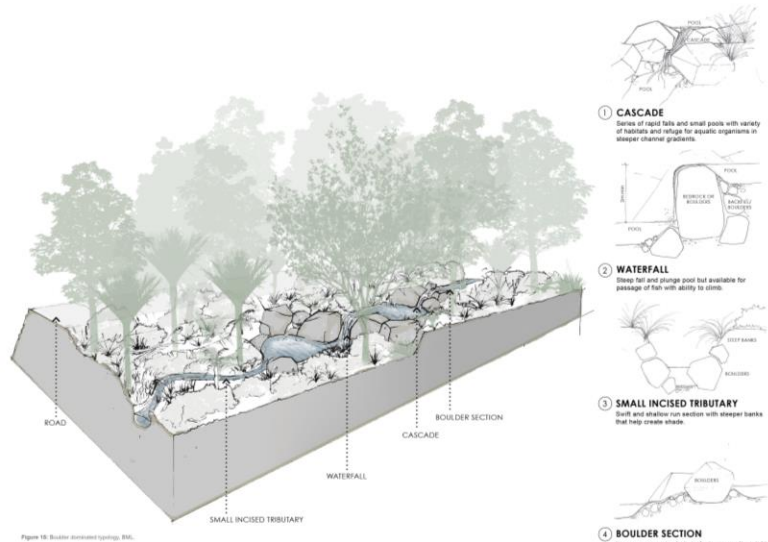
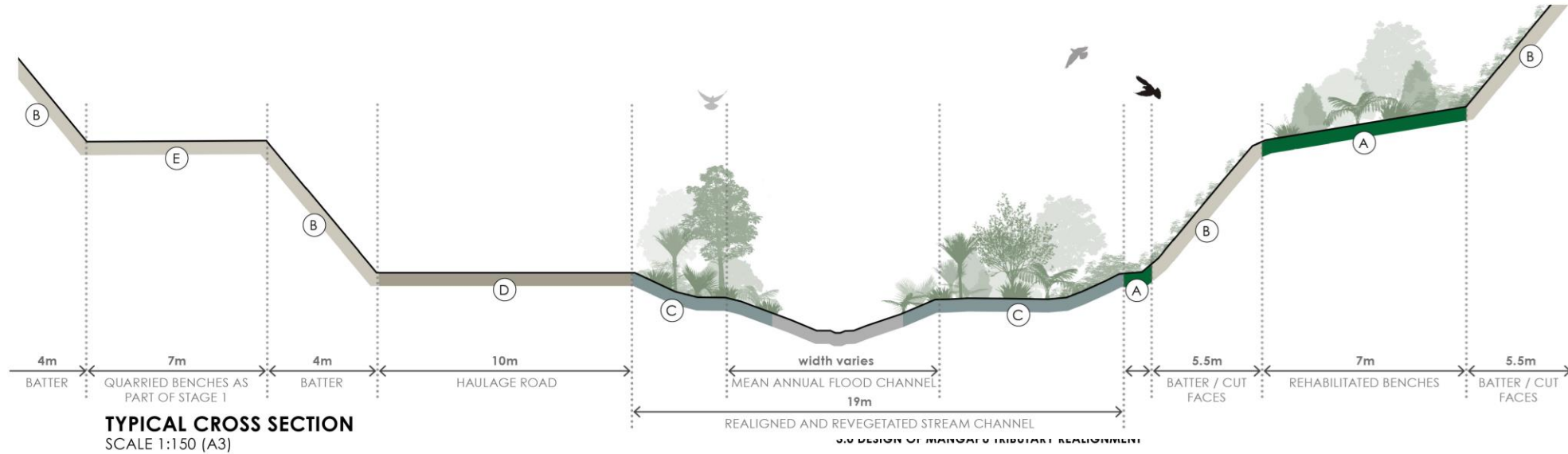


Figure 18: Boulder incised tributary, BMS.

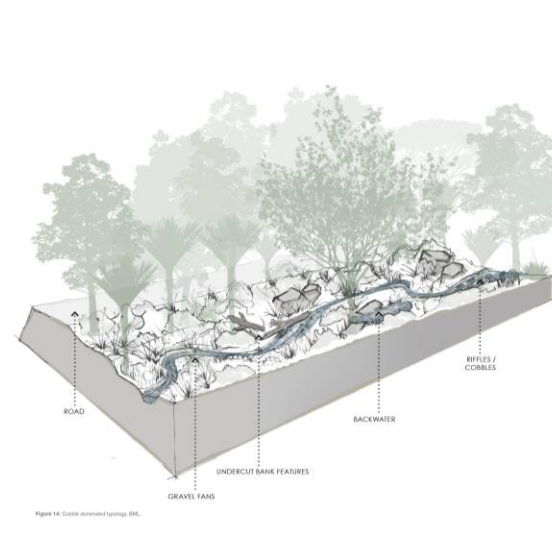
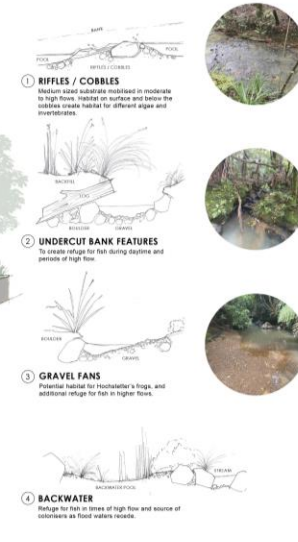
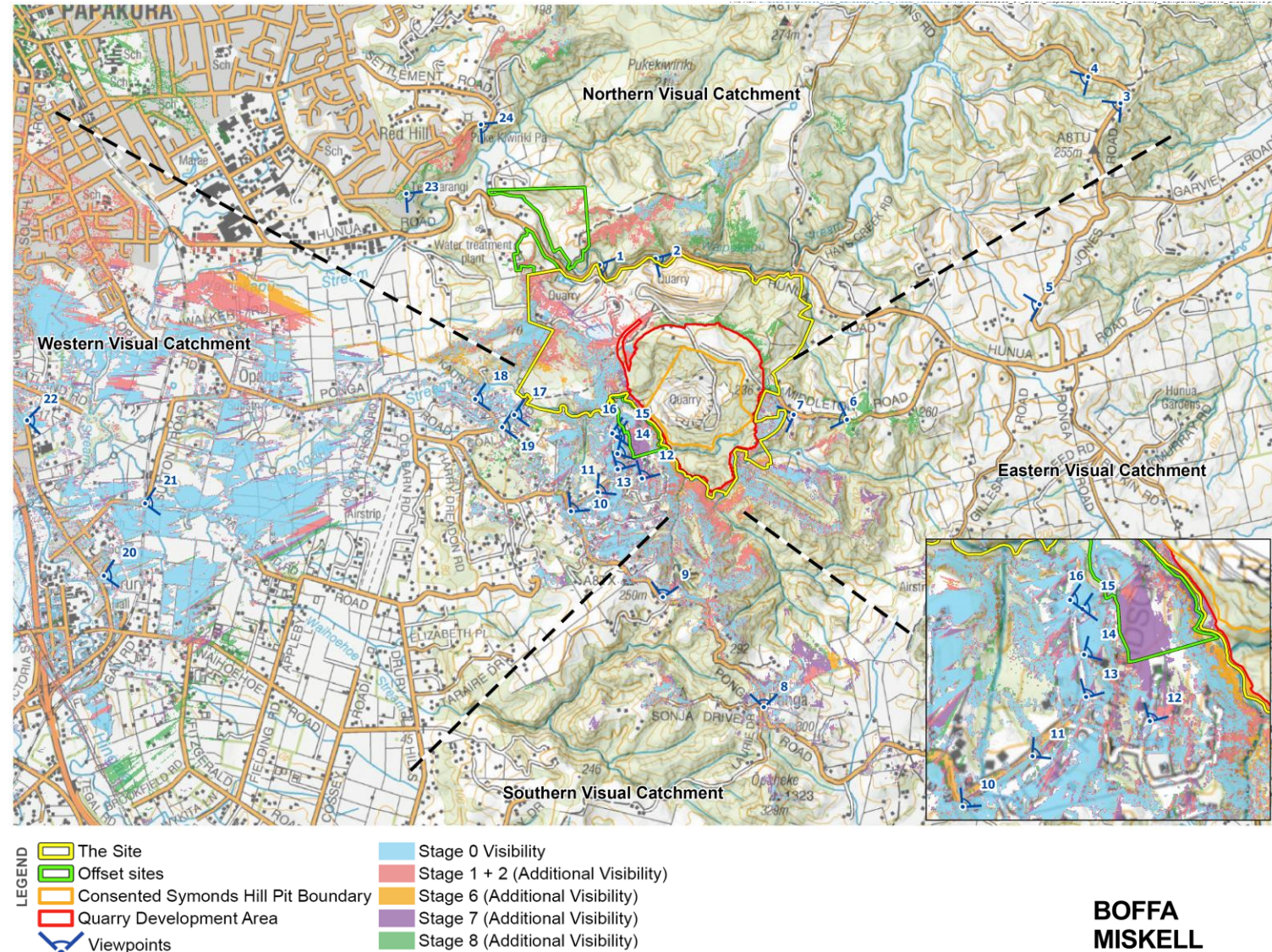


Figure 19: Cobble incised tributary, BMS.



Visual Effects: public locations

- For most public roads and distant viewing locations, the quarry is either not visible or forms a small, contained element within a broader vegetated landscape, particularly once rehabilitation planting is established.
- **Closer roads and elevated viewing locations**, including parts of Middleton Road, Ponga Road, Judge Richardson Drive, and southern and western private dwellings, will experience **more noticeable changes, especially during Stages 7 and 8** when quarry faces widen, ridges are lowered, and exposed benches become visible.
- However, these **changes will occur gradually over time**, and the **quarry is already a long-established landscape feature** in many of these views.



Viewpoints



Viewpoint 9 is located on Ponga Road, approximately 920m south of the quarry development area, looking in a northerly direction towards the Site.



Viewpoint 10 is located on Ponga Road near the intersection with Judge Richardson Drive, approximately 925m southwest of the quarry development area, looking in a northeasterly direction towards the Site.



Viewpoint 11 is located on Judge Richardson Drive, approximately 660m southwest of the quarry development area, looking in a northeasterly direction towards the Site.



Viewpoint 12 is located near 215 Judge Richardson Drive, approximately 315m southwest of the quarry development area, looking in a northeasterly direction towards the Site.

Visual Simulations



Visual Simulation B (existing view)



Visual Simulation B (Stage 7 view - with mitigation planting on the Judge Richardson Drive offset site)



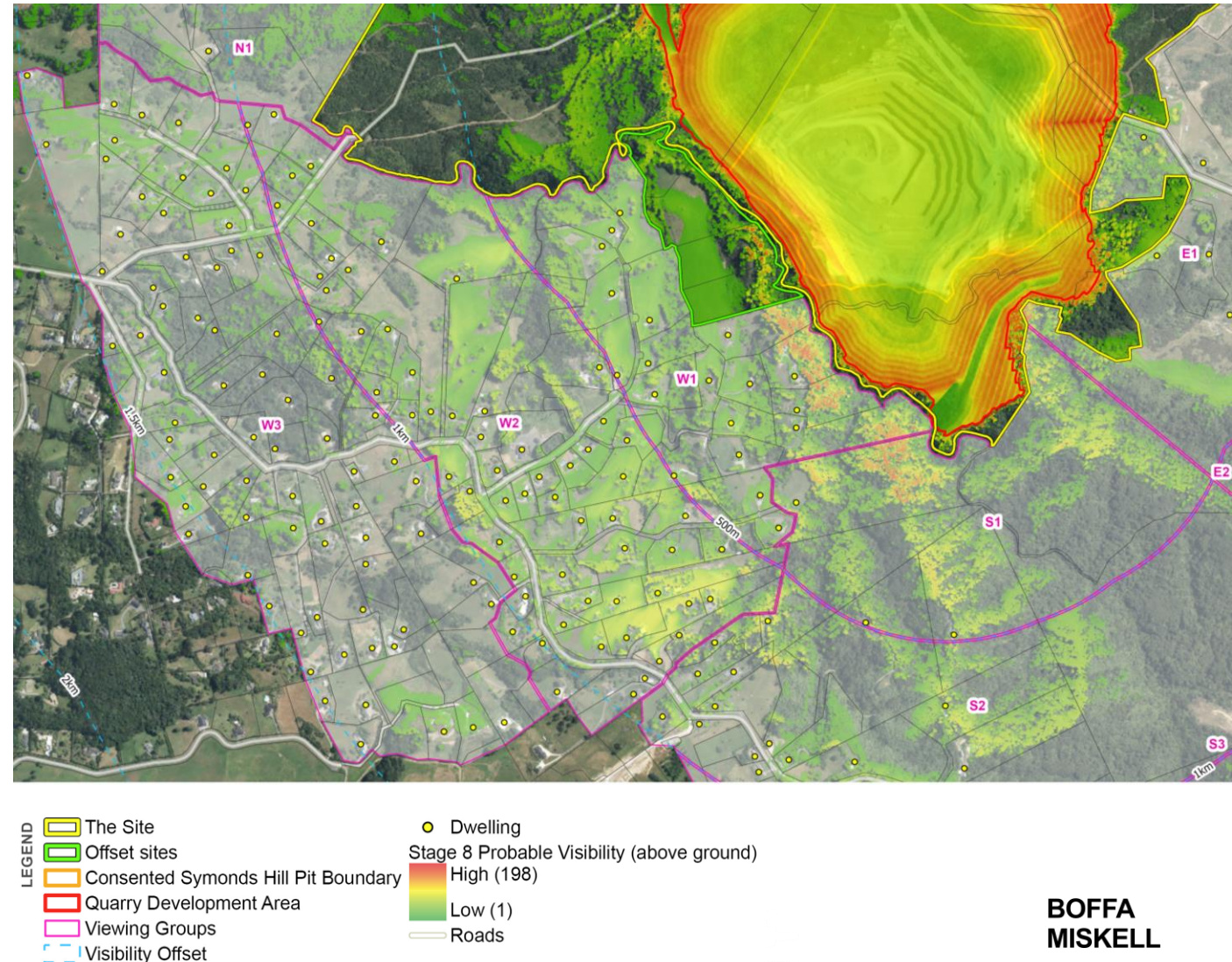
Visual Simulation B (Stage 2 view - with mitigation planting on the Judge Richardson Drive offset site)



Visual Simulation B (Stage 8 view - with mitigation planting on the Judge Richardson Drive offset site and rehabilitation planting on benches)

Visual Effects: private locations

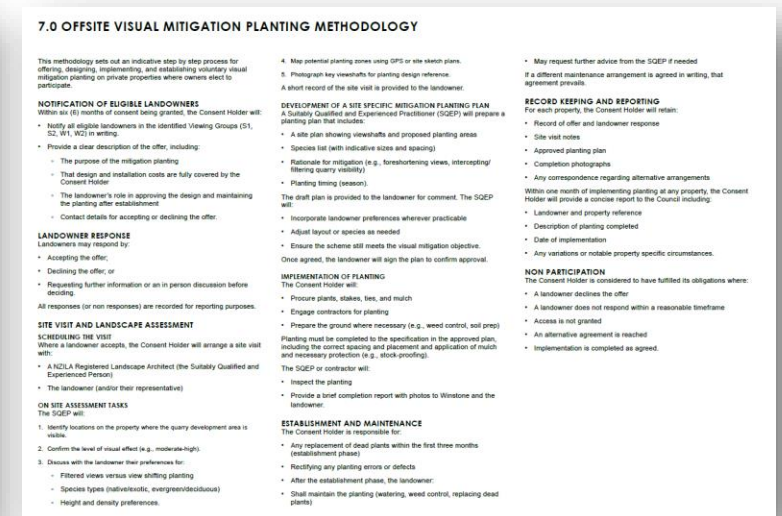
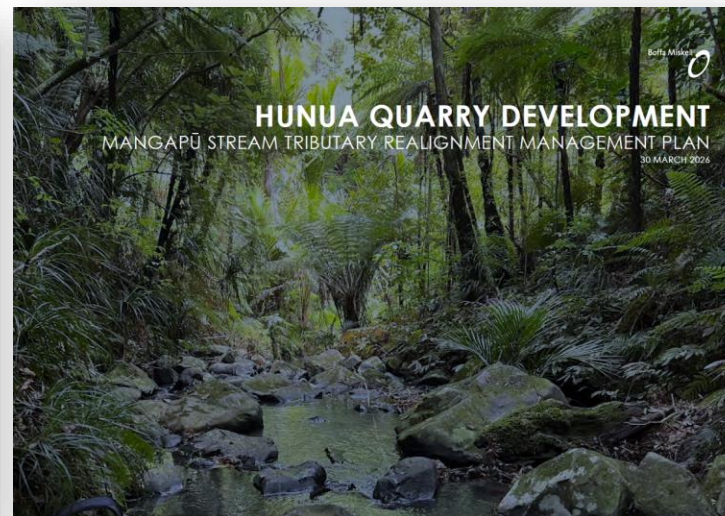
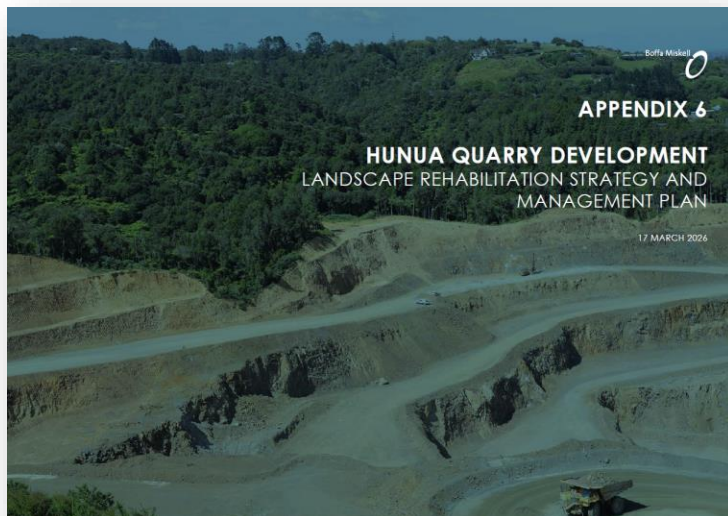
- Mitigation options within the Site are limited in their ability to address the visual effects experienced from private properties of the quarry development area. For this reason, **an off-site planting mitigation measure (Augier type approach) is recommended to provide more effective screening where appropriate** and feasible for those who will experience visual effects of moderate-high (adverse).
- In parallel, **progressive rehabilitation will soften exposed landforms and re-establish green backdrops**, reducing visual contrast and enabling the modified landform to gradually reintegrate into the surrounding hill country.
- Together, these measures will help ensure that **visual effects diminish over time** as planting matures and rehabilitated areas become more visually cohesive with the wider landscape.



Managing the Landscape, Natural Character and Visual Effects

Conditions + Management Plans

- Native Revegetation on Judge Richardson Drive
- Landscape Rehabilitation Strategy and Management Plan
- Mangapū Stream Tributary Realignment Management Plan
- Off-site mitigation planting



Ecology: Effects management overview

- The ecological outcome is to provide well connected and valuable biodiversity hubs within the neighbouring and local landscape.
- Each hub or focus area has similar attributes and integrates the offset and compensation actions.
- The whole is much greater than the component parts.
- The location of new indigenous plantings alongside existing mature bush stands creates connections for flora and fauna that builds resilience and refuge for the ecosystem.
- Each hub includes enhancements to streams and wetlands within headwater catchments, thus improving water quality before it descend its catchment.
- The biodiversity hubs are substantially improved by the implementation of landscape-scale pest and weed management with strong border management preventing re-invasions.

Existing Environment: Terrestrial Ecology

Broadly characteristic of vegetation of Hunua Ranges.

Seven vegetation types.

Quantitative RECCE plots.

Characterised by successional stage.

AEE Appendix B12.4.5a, Section 5.1.1, Pages 36-48.

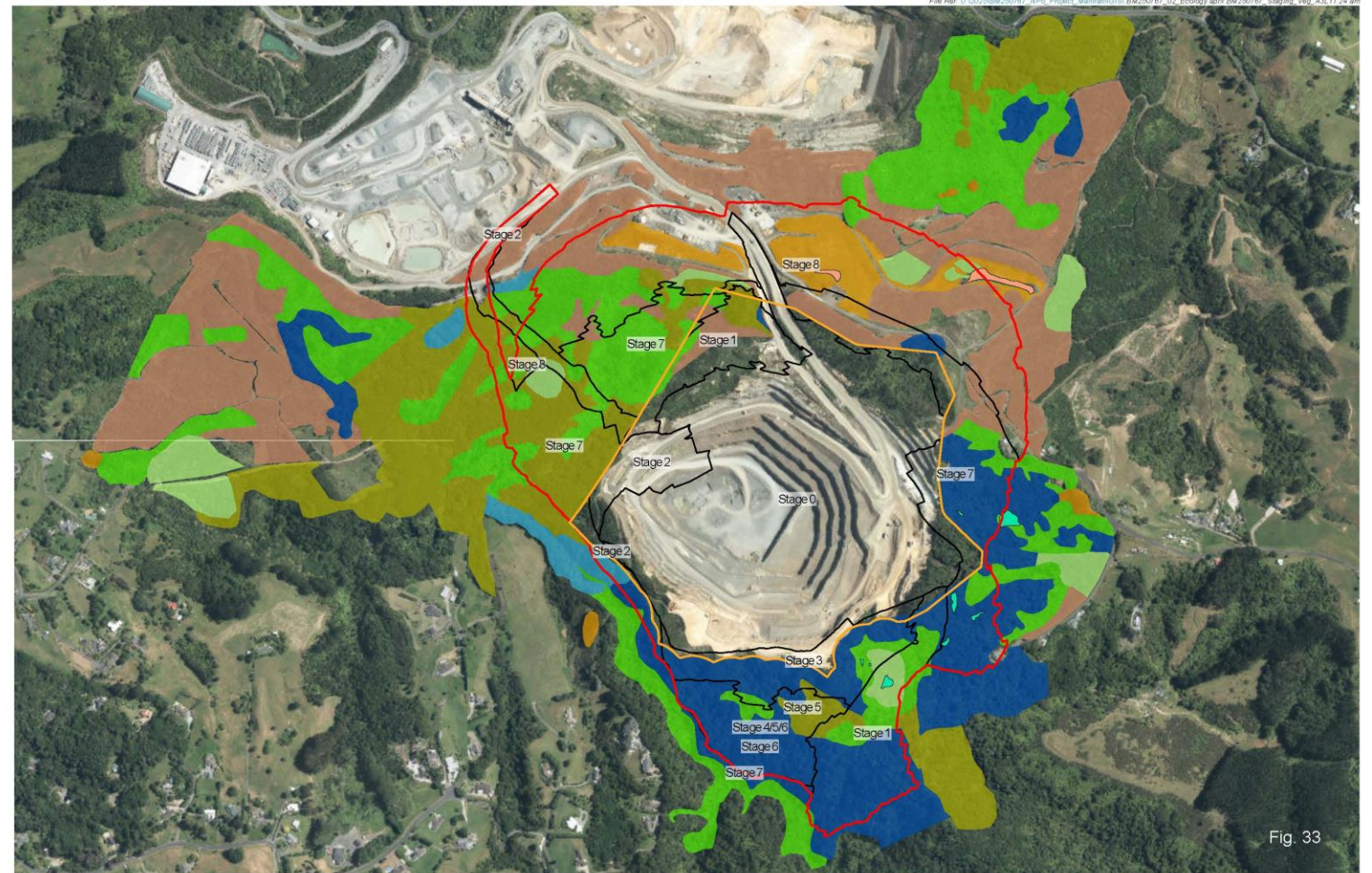
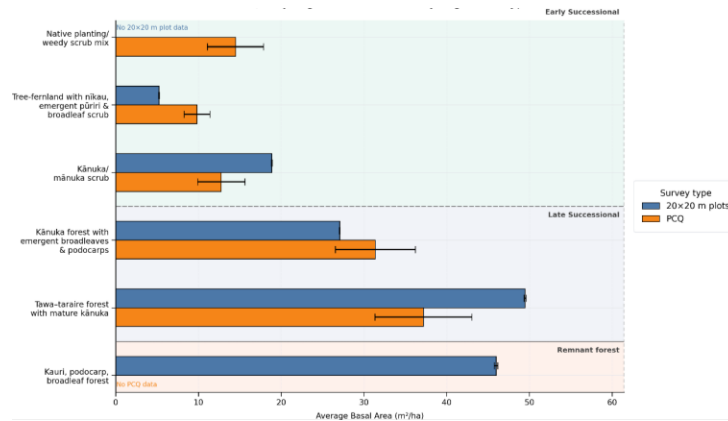


Fig. 33

Existing Environment: Terrestrial Ecology



Taraire-tawa-pukatea forest type



Regenerating podocarps



Remnant mature kauri forest



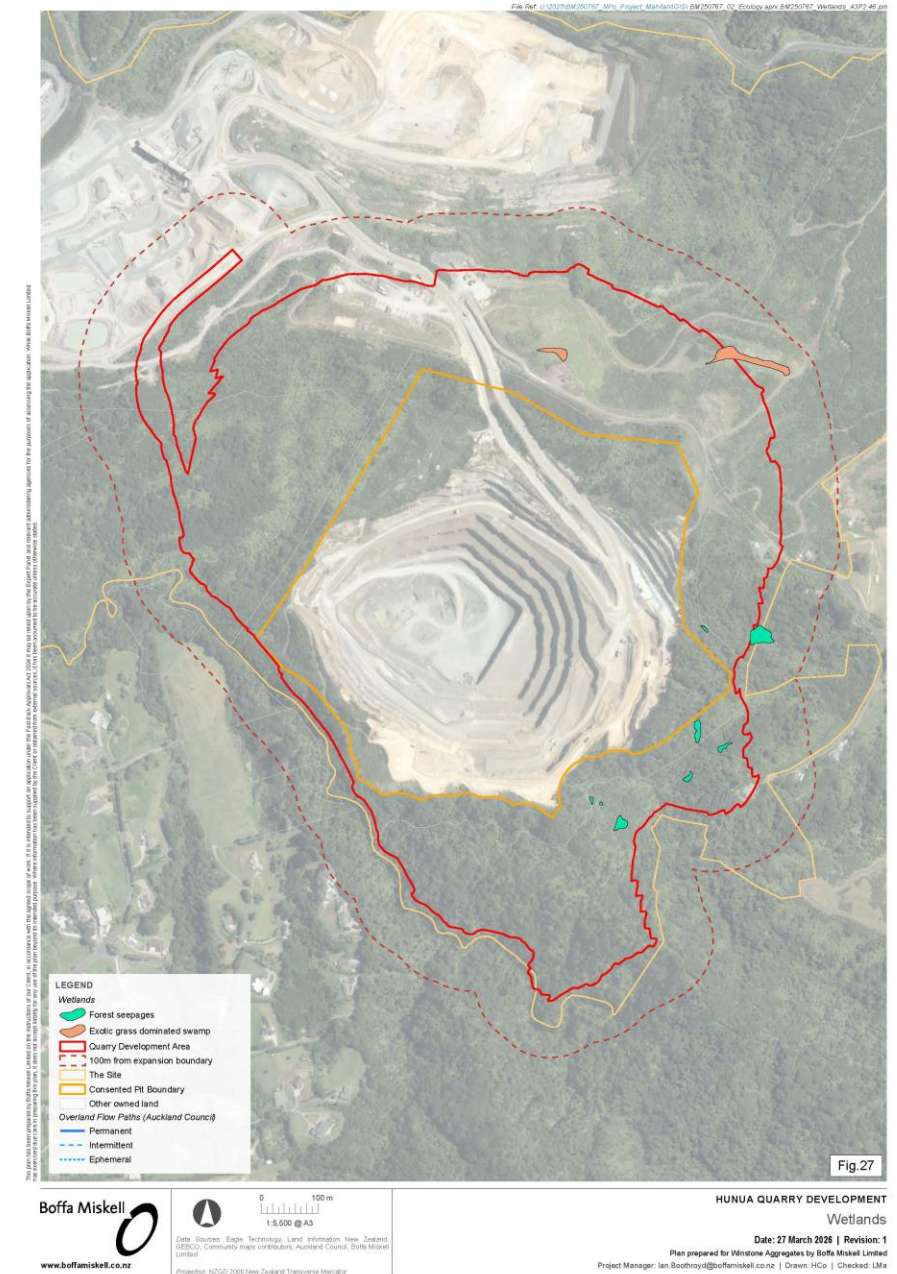
Kanuka forest

Existing Environment: Wetlands

- 10 small wetland features (0.44 ha in total).
- 8 are forested gully or toeslope seepages within the SEA.
- 2 exotic grass dominated swamps on terraces in the northern part of the Site.
- Wetland features within the forest are of moderate or high quality.
- Exotic grass dominated swamps are low quality.

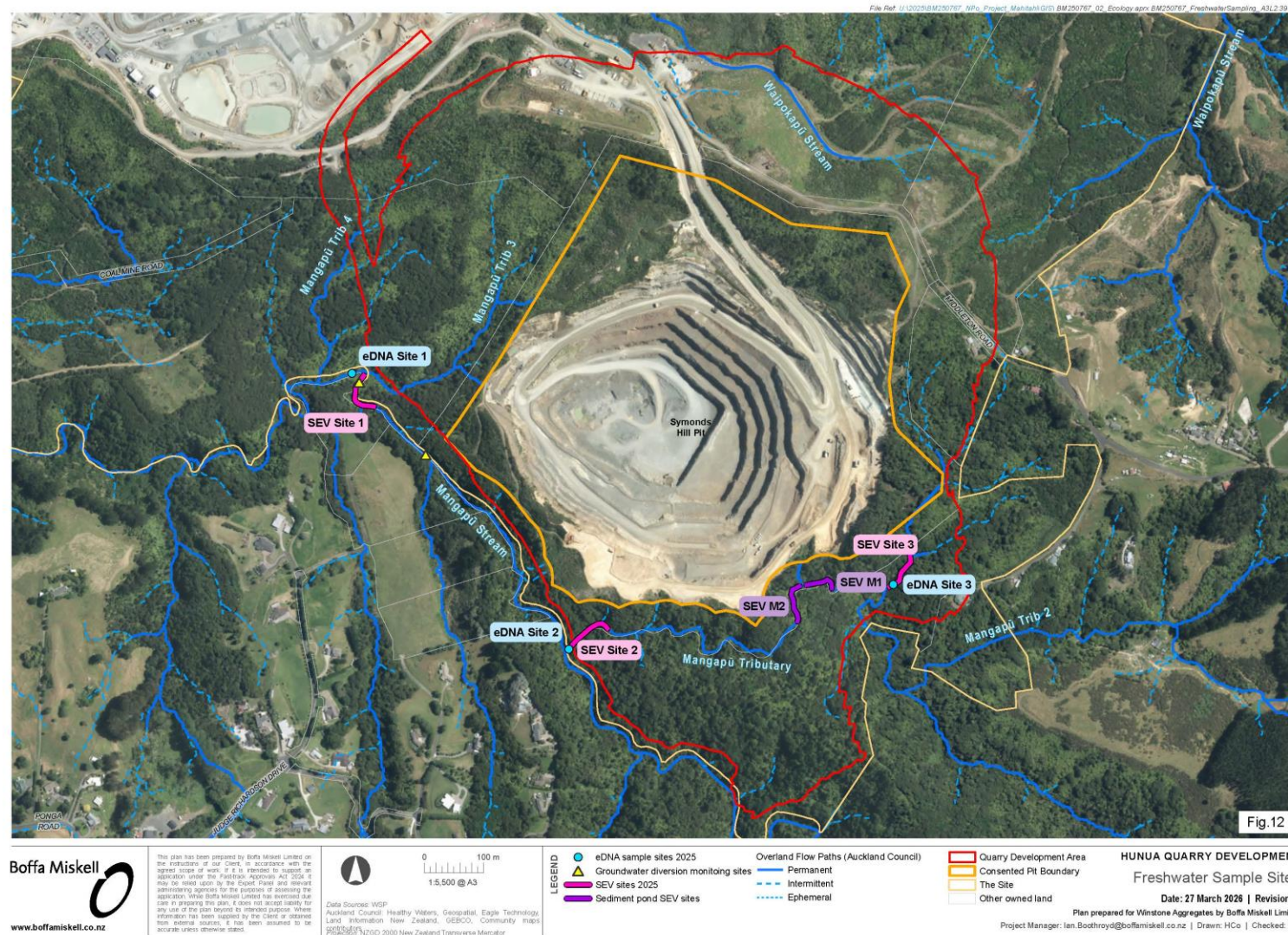


AEE Appendix B12.4.5a, Section 5.4, Page 55



Existing Environment: Aquatic Ecology

- Slippery Creek catchment
- Mangapū Stream and Mangapū Tributary
- eDNA:
 - Climbing fish – eels, banded kōkopu
 - Kōura
 - Limpet
- No mussels
- No rare or threatened fauna
- High ecological values



Managing the Effects: Ecology Effects Management

Overview

- Salvage and relocation actions for both aquatic fauna and terrestrial fauna (*AEE Appendix B12.4.5a, Section 9.3.2*)
- Revegetation of large areas to offset for removal of indigenous vegetation, wetland and fauna habitats (*AEE Appendix B12.4.5b, Section 9.8*).
- Pest management to offset and compensate the removal of indigenous vegetation, wetland and fauna habitats (*AEE Appendix B12.4.5b, Section 9.8.4.3*)
- Wetland rehabilitation (*AEE Appendix B12.4.5b, Section 9.9*).
- Realignment of the Mangapū Tributary to remedy the removal of some of the existing channel (*AEE Appendix B12.4.5b, Section 10*).

Additional methods of effects management include:

- Flow augmentation to remedy effects on local watercourses (*AEE Appendix B12.4.5a, Section 9.4.3*).
- Improvements to existing barriers to freshwater fish migration and opening a substantial extent of upstream habitat for fish and other migratory species.

Staging

- **Tranche 1: Stages 1 – 4** of the quarry development involves clearance of 17.07 ha of indigenous forest. Planting of Tranche 1 will commence with the granting of consent.
- Includes all revegetation within Focus Area 1 other than the Hunua Quarry Pit, and all of Focus Areas 2 and 3, comprising a total area of 59.82 ha.
- **Tranche 2: Stages 5 – 8** of quarry development will involve removal of 27.39 ha of mature and early successional indigenous vegetation.
- Tranche 2 (25.8 ha) of revegetation planting at the infilled Hunua Quarry Pit will commence at approximately Yr 30.

AEE Appendix B12.4.5b, Section 9.8.2, Pages 110-111

- For aquatic ecology the full extent of stream loss at Stage 2 is calculated as all Stage 7 loss and offset commences as soon as consent is granted (Tranche 1), even though full loss of Tributaries 3 and 4 does not occur until Stage 7 of the quarry expansion.

AEE Appendix B12.4.5b, Section 9.10.3, Page 122

Managing the Effects: Fauna Management



Lizard salvage

Relocation to Hunua Range

Fish salvage and relocation

Bird nest checks

Acoustic surveys for Bats



Managing the Effects: Ecology

Loss of 44 ha of indigenous vegetation

Offset planting of 82 ha of indigenous vegetation.

Use of BOAM.

*AEE Appendix 12.4.5b, Section 9.8,
Pages 110-117.*

Loss of 0.44 ha of wetland

Re-establishment of some 0.5 ha of wetlands.

Enhancement of 0.15 ha of wetlands.

Landscape-scale pest management.

Use of BOAM

*AEE Appendix 12.4.5b, Section 9.9,
Pages 117-118.*

Loss of 1,157 m of intermittent and permanent stream length (after realignment of 570 m)

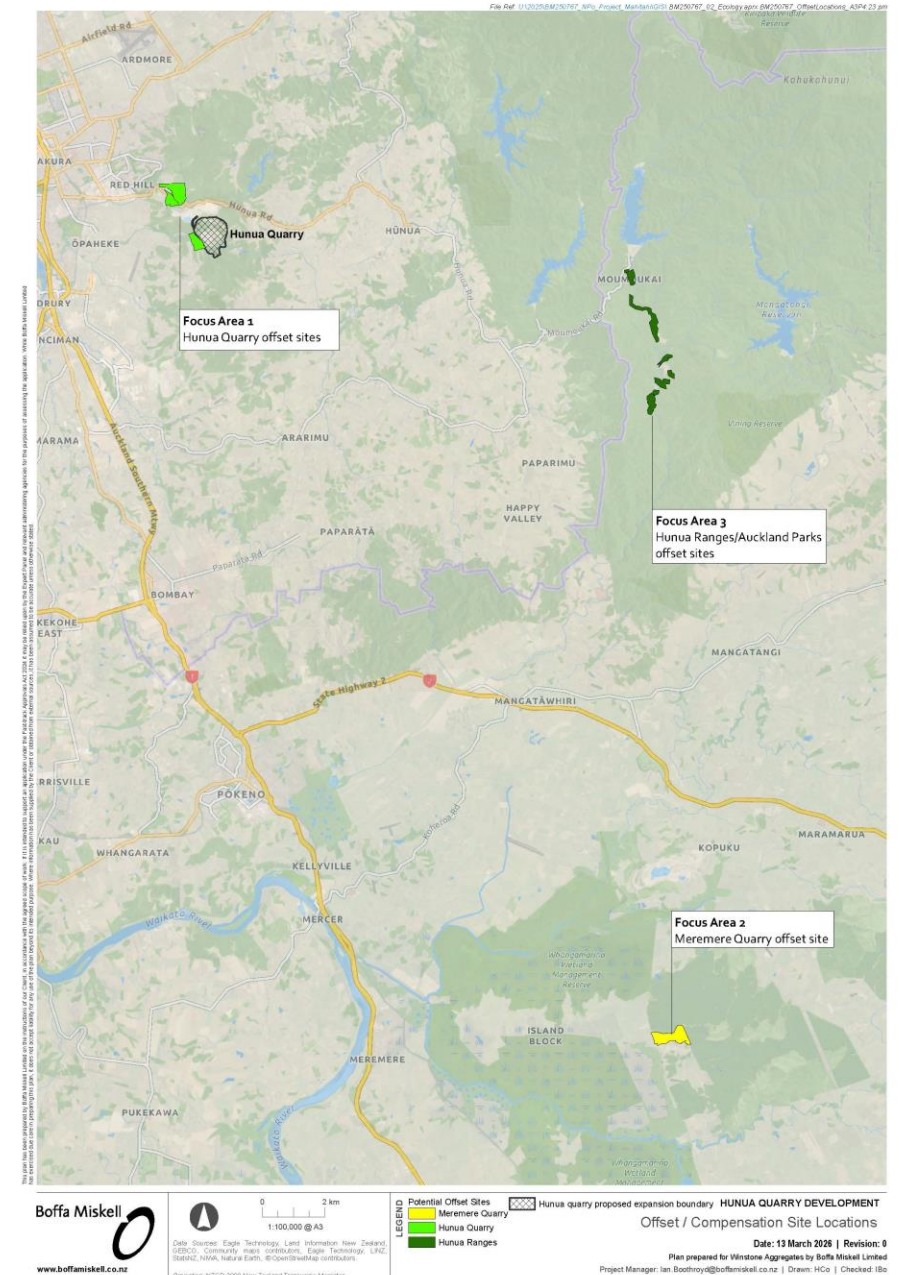
Enhancement of aquatic values of 1,000 m of current pasture watercourses: Waipokapū Stream and Meremere Quarry Stream

Removal of willows and enhancement aquatic values to 2,580 m of watercourse: Mangatawhiri Stream.

Improved water quality of two headwater catchments: the Waipokapū Stream and Meremere Quarry Stream

Use of ECR

*AEE Appendix 12.4.5b, Section 9.10,
Pages 118-114.*



Managing the Effects: Ecology

Focus Area 1 Hunua: All on land owned by Winstone

Infill planting between mature SEAs (11.5 ha).

Legal protection of 24 ha of new planting and existing mature vegetation.

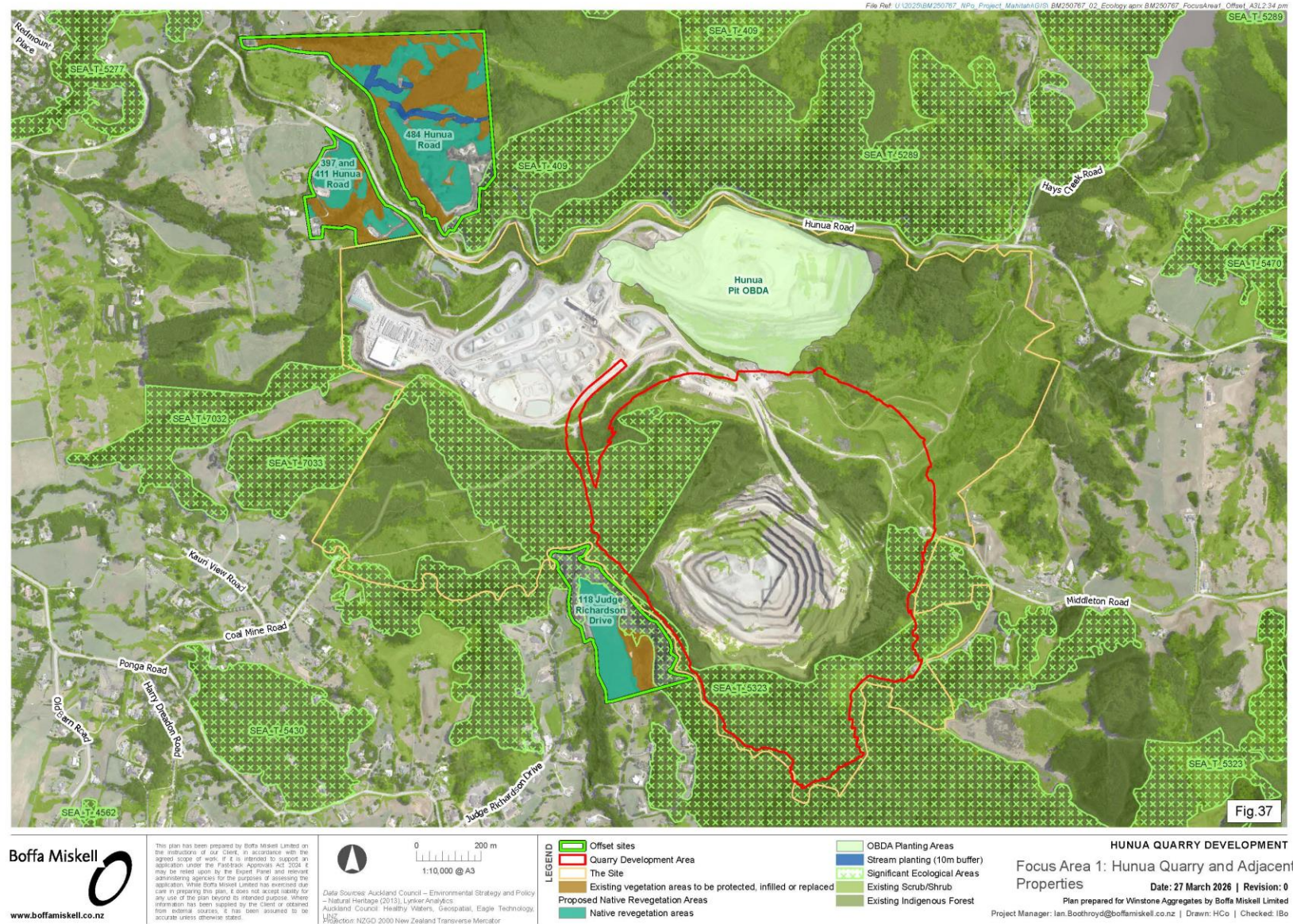
Ecological planting at Judge Richardson Drive (3.7 ha).

Removing farm ponds and returning stream connectivity of some 150 m

Vegetation of 18 ha of upper tributary headwater catchment of the Waihokopu Stream (improvements to water quality).

Improving fish access to upper Waihokopu Stream (~610 m).

AEE Appendix 12.4.5b, Section 9.5.3, Page 100



Managing the Effects: Ecology

Focus Area 2 Meremere: All on land owned by Winstone

1,900 m extent of watercourse

Riparian enhancements to some 400 m of stream length.

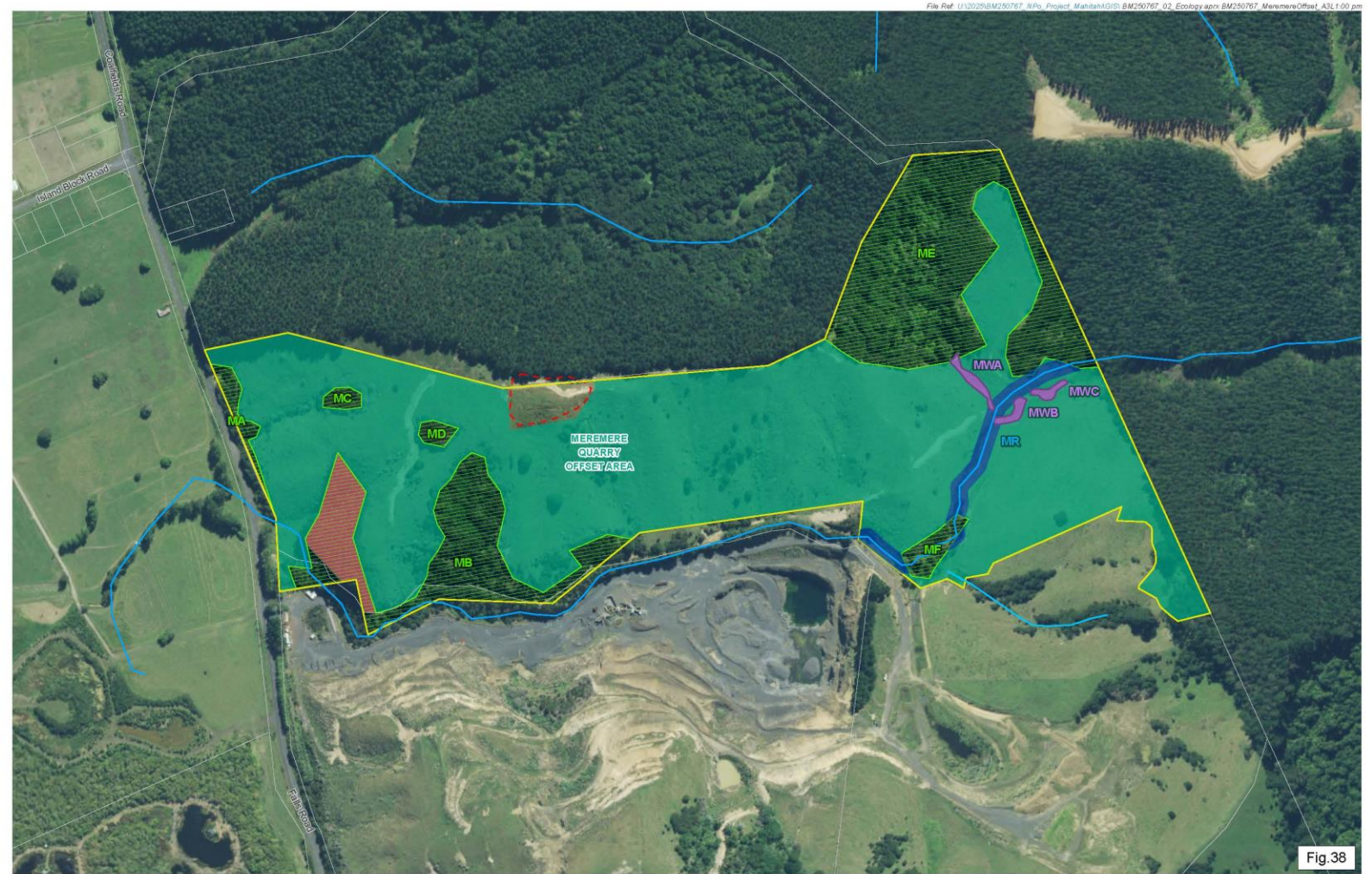
New infill plantings (21.1 ha).

New and existing vegetation amounting to 28.7 ha of indigenous vegetation of upper catchment.

Enhancement planting and protection for 0.15 ha of wetlands.

Comprehensive pest management

AEE Appendix 12.4.5b, Section 9.5.4, Page 101



Boffa Miskell
www.boffamiskell.co.nz

This plan has been prepared by Boffa Miskell Limited on the instructions of our Client, in accordance with the agreed scope of work, it is intended to support an application under the Resource Management Act 1991. It may be relied upon by the Expert Panel and relevant administering agencies for the purposes of assessing the application. Boffa Miskell Limited has exercised due care in preparing this plan, it does not accept liability for any use of the plan beyond its intended purpose. Where information has been supplied by the Client or obtained from external sources, it has been assumed to be accurate unless otherwise stated.

Data Sources: Eagle Technology, LINZ
Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND
Streams (LINZ)
Meremere Offset Site Boundary
Existing vegetation
Approximate existing wetland areas
Plantation forest
Offset area
Riparian margin

Site of Significance to Maori
Parcels (LINZ)

Label key
M: Meremere
W: Wetland
R: Riparian
A-F: Existing vegetation area -

HUNUA QUARRY DEVELOPMENT
Focus Area 2: Meremere Quarry

Date: 27 March 2026 | Revision: 3
Plan prepared for Winstone Aggregates by Boffa Miskell Limited
Project Manager: Ian.Boothroyd@boffamiskell.co.nz | Drawn: HCo | Checked: IBo

Managing the Effects: Ecology

Focus Area 3 Hunua Ranges: In agreement with Auckland Council Parks

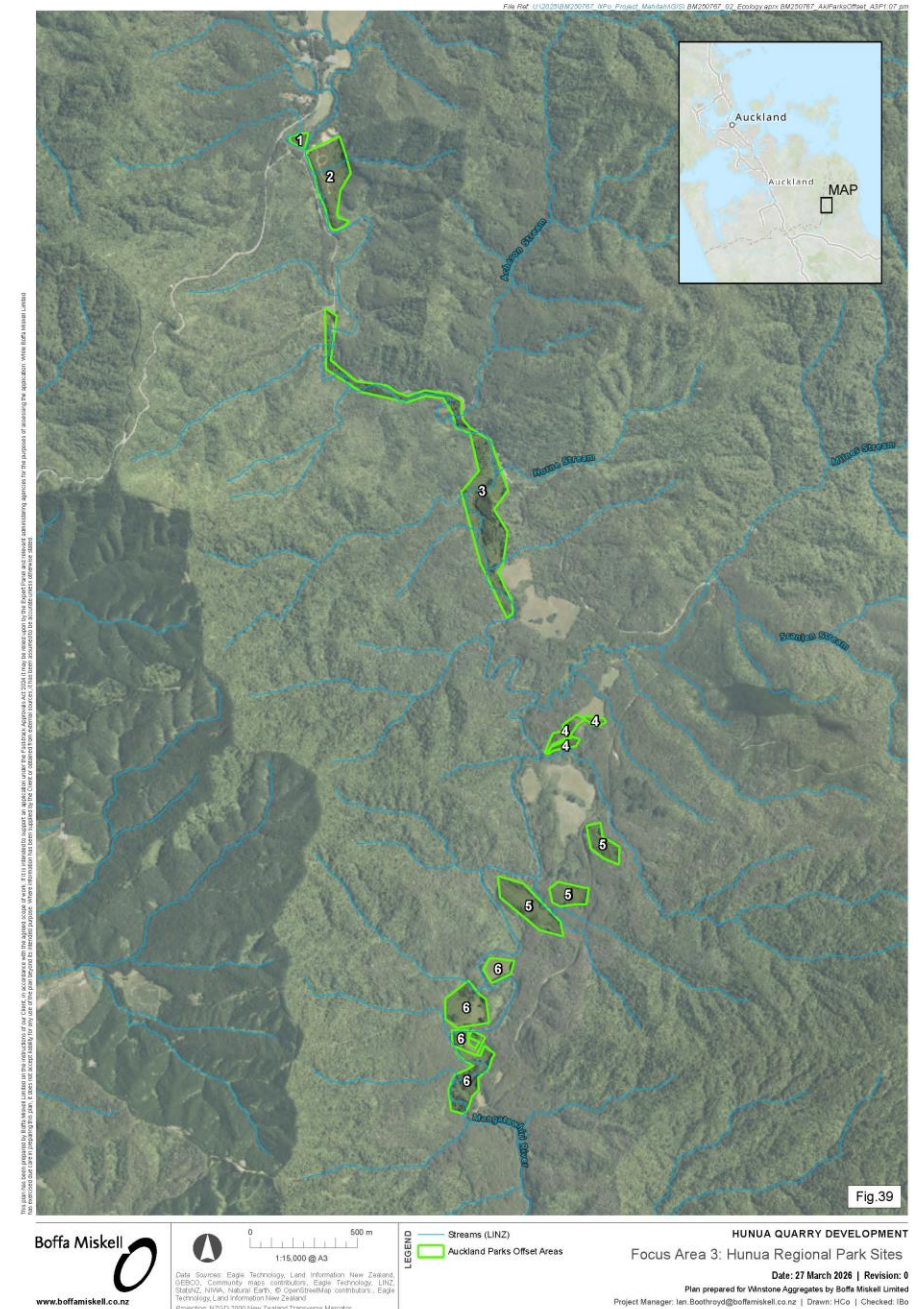
New ecological plantings to infill between and alongside existing mature indigenous forest.

Removal of willows and enhancement aquatic values to 2,580 m of watercourse: Mangatawhiri Stream.

Infill ecological planting of some 30 ha of upper catchment.

Winstone Aggregates have entered into a formal confirmation of landowner support for proposed offset planting and associated ecological management measures with Auckland Parks within the Hunua Regional Park

AEE Appendix 12.4.5b, Section 9.5.5, Page 102



Effects Management Hierarchy	Loss of indigenous vegetation from quarry expansion	Lizards	Bats – not found at present	Birds	Mangapū Stream tributary realignment	Other Mangapū Stream tributaries	Aquatic Fauna	Wetland areas
Avoid	Unavoidable loss of 44 ha of indigenous vegetation	Avoid fatality through implementation of management plan protocols.	Avoid fatality through standard tree felling protocols.	Avoid tree felling during bird breeding.	Unavoidable loss of 1200 m of intermittent and permanent stream length.	Unavoidable loss of 527 m of intermittent permanent stream length.		Unavoidable loss of 0.44 ha of wetland
Minimise	Minimise vegetation loss as much as is practicable.	Minimise fatality through salvage of geckos and any other native lizards (if detected), via management plan protocols	Check for nests if felling occurs during roosting season - resource consent condition	Check for nests if felling occurs during bird breeding season	Minimise stream loss as much as is practicable. Maintain passage opportunity for climbing fish	Minimise stream loss as much as is practicable.	Minimise fatality of fish and koura through salvage.	
Remedy		Relocation of geckos to release site with appropriate pest management for protective benefit of the population	N/A	N/A	Realignment of 570m stream length. Flow augmentation to sustain flows as needed.	Augmentation of flows for potential dewatering of Mangapū Stream	Relocation of fish and koura to release sites downstream.	BOFFA MISKELL

RESIDUAL EFFECTS	Unavoidable loss of 44 ha of indigenous vegetation	No	No	No	Unavoidable loss of 630 m intermittent and permanent stream	Unavoidable loss of 527 m of intermittent permanent stream length.	No	Unavoidable loss of 0.44 ha	
Offset	Offset planting of 82 ha of indigenous vegetation	N/A	N/A	N/A	Enhancement of aquatic values of 1,000 m of current pasture watercourses: Waipokapū Stream and Meremere Quarry Stream Removal of willows and enhancement aquatic values to 2,580 m of watercourse: Mangatawhiri Stream.			Re-establishment of some 0.5 ha of wetlands. Enhancement of 0.15 ha of wetlands.	
Compensation	Integrated and comprehensive landscape-scale pest management strategy to form Hunua Biodiversity hub	N/A	N/A	N/A	150 m extent of watercourse created from replacement of farm ponds 4,000 m of extent of watercourse connected for migratory climbing fish access including to and from downstream RAMSAR-listed Whangamarino Wetland. Improved water quality of two headwater catchments: the Waipokapū Stream and Meremere Quarry Stream			Integrated and comprehensive landscape-scale pest management strategy to include wetland areas and their margins	
Overall outcome	No net loss of indigenous biodiversity and loss of aquatic values and extent of wetlands and watercourses.								BOFFA MISKELL

Effects Management: Ecology

Management Plans

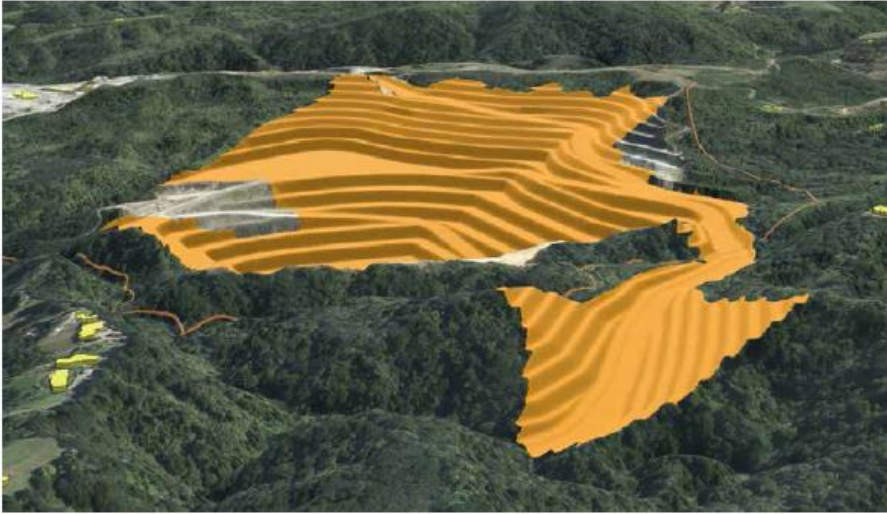
- Aquatic Fauna Salvage and Relocation Plan
- Stream Realignment Management Plan
- Lizard Management Plan
- Ecological Management Plan
- Landscape Rehabilitation Plan
- Pest Management Plan

Approvals

- Wildlife Act Approval
- Complex Freshwater Fisheries Act Approval

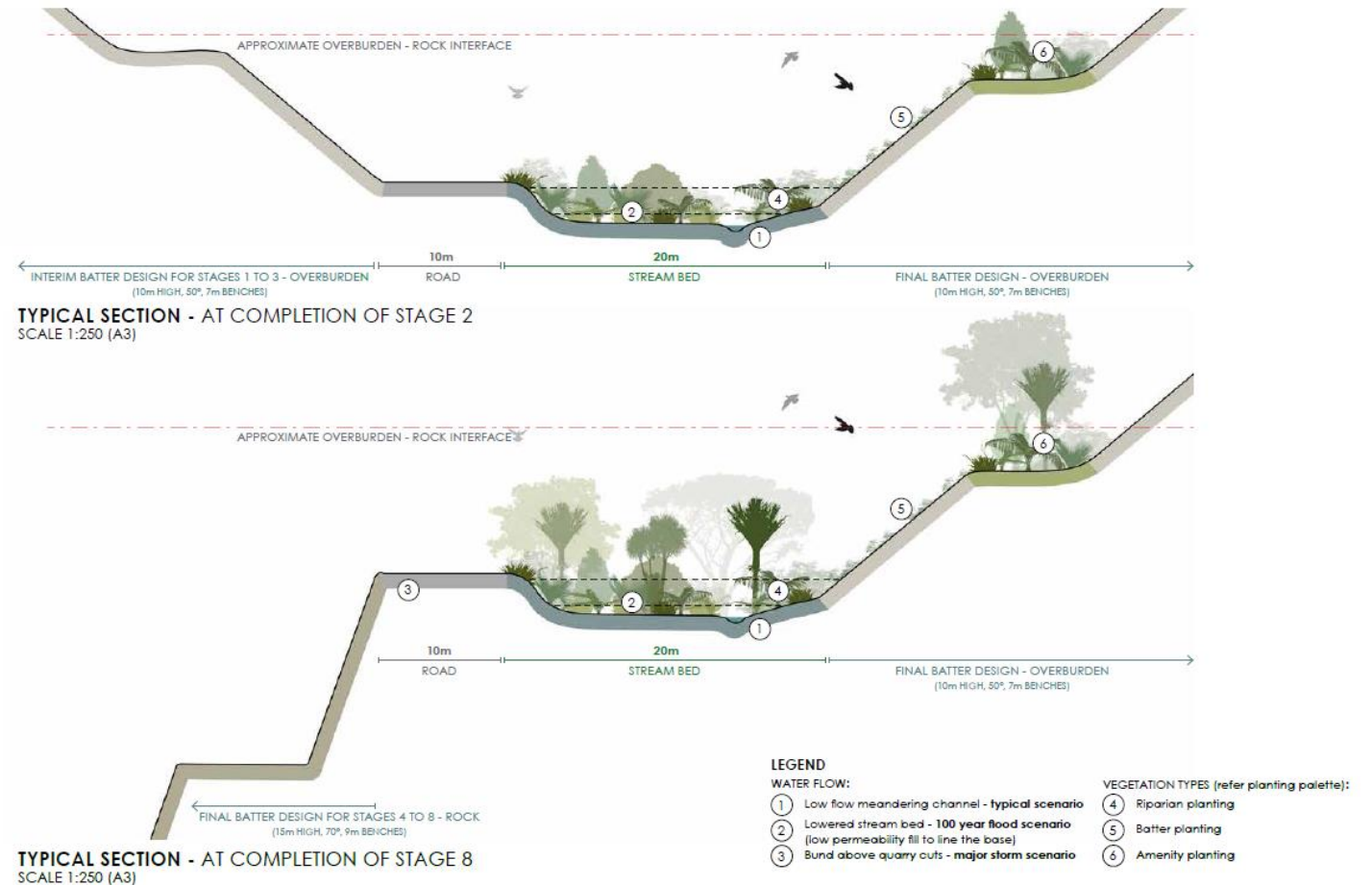
The effects management hierarchy is satisfied.

Mangapū Tributary Realignment



- Stream crossing
- Realignment development
- Multi-livening of diversion
- Fish salvage and relocation
- eDNA:
 - Climbing fish – eels, banded kōkopu
 - Kōura
 - Limpet

AEE Appendix B12.4.5b, Section 10, Pages 125-141



DESIGN PRINCIPLES

- Ensure long-term stream health and maintain a functioning ecosystem.
- Integrate mātauranga Māori in stream management practices.
- Create an ecologically resilient and self-sustaining system.
- Establish indigenous vegetation to encourage natural regeneration and provide habitat along the stream corridor.
- Account for variations in groundwater flows.
- Adopt a natural form with organic features such as meanders, variability, and rock placements.
- Maintain the carrying capacity of existing flows.
- Ensure structural stability and prevent leakage.
- Incorporate natural sinuosity for a dynamic, lifelike stream pattern.
- Design to accommodate storm events up to the 1-in-100-year ARI level.



Figure 5: Photo of upper Mangapō tributary, large meander, slow flow pool



Figure 6: Proposed stream diversion design (indicative)

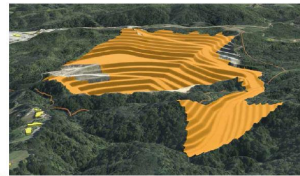


Figure 7: Mangapō tributary



Figure 8: Waterfall within the Mangapō tributary

Stream realignment – Phased livening of realignment channel

Rock weir – Riffle-like

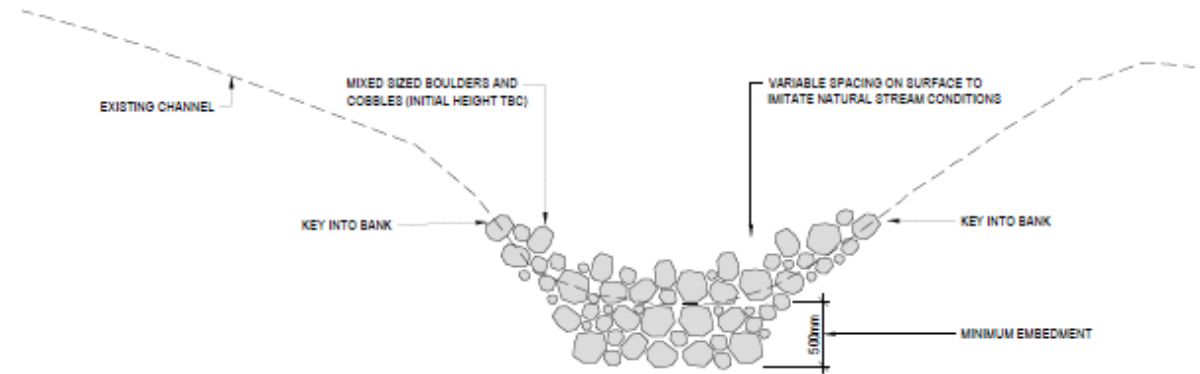
Temporary and dynamic structure

Build up to restrict and divert flows

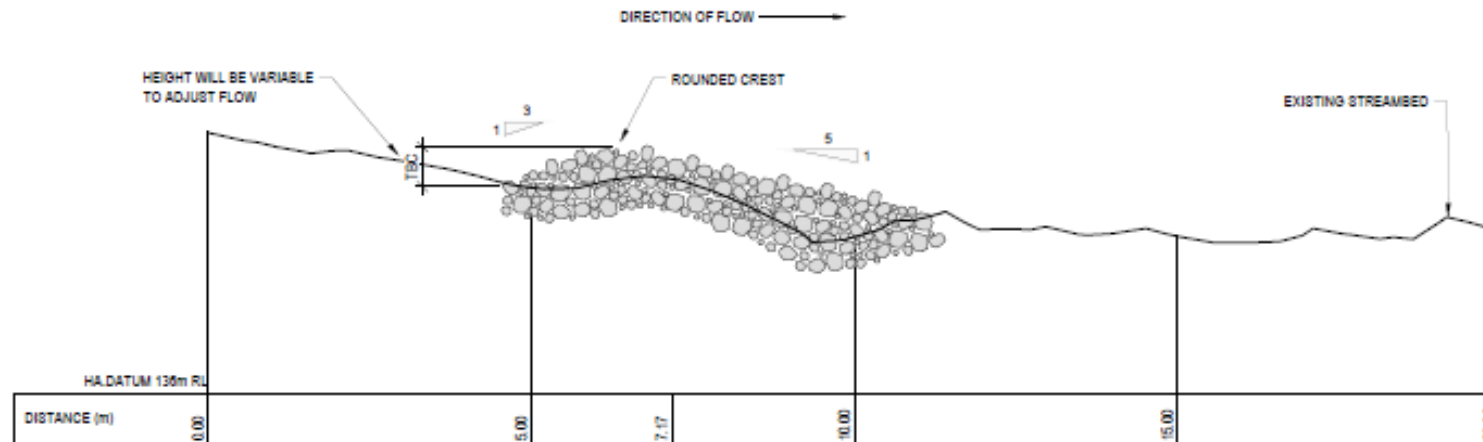
Rounded crest

Interstitial flows

Climbing fish

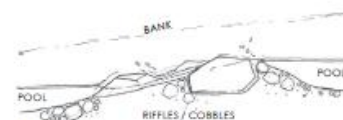
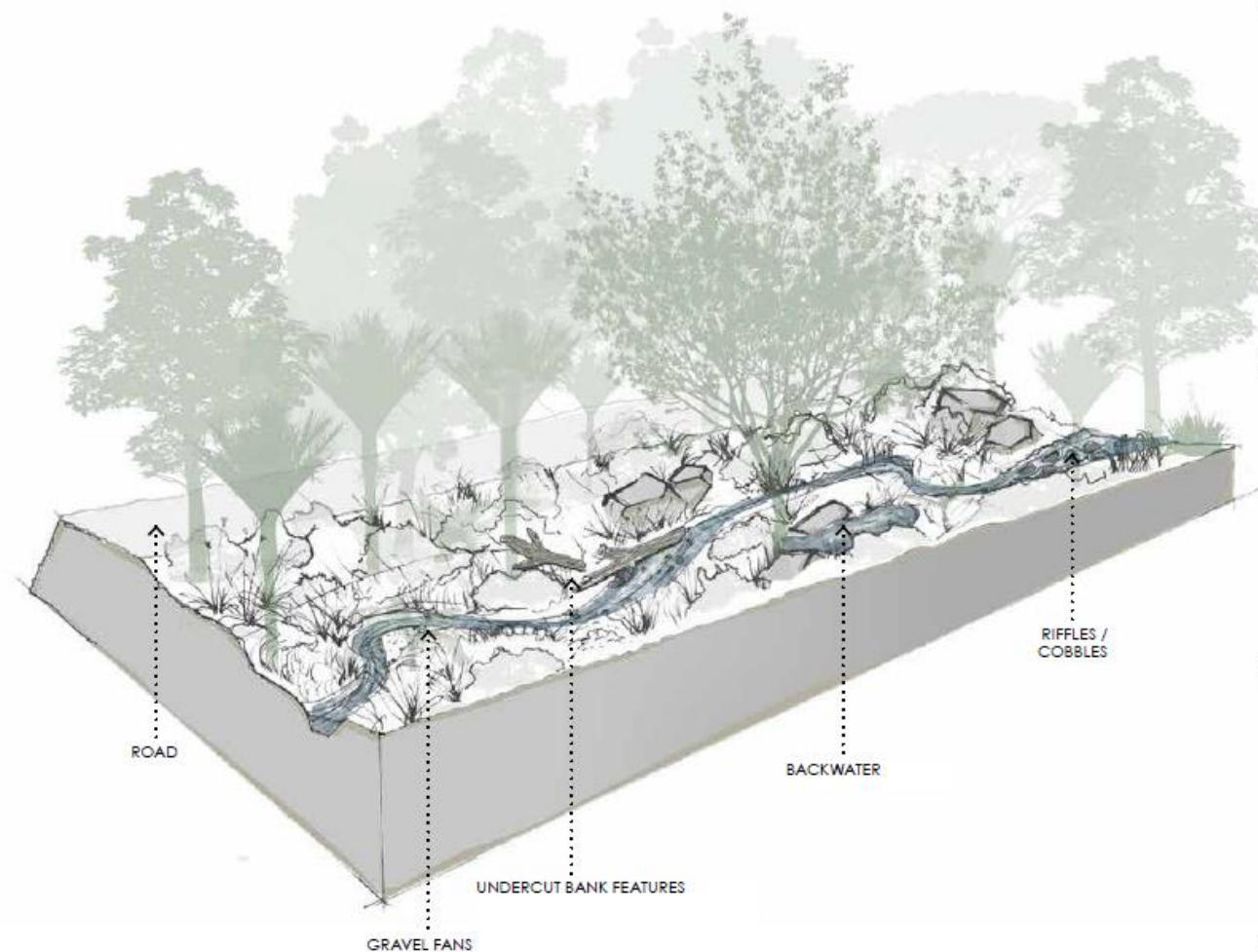


TYPICAL CROSS-SECTION
SCALE 1:50



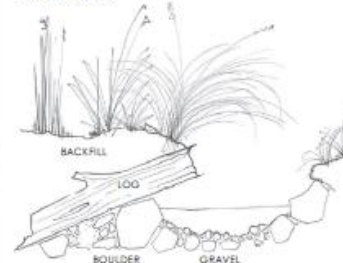
TYPICAL LONG-SECTION
SCALE 1:100

Stream Diversion – Cobble substrate section typology



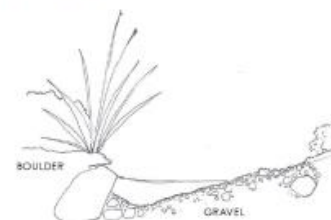
① RIFFLES / COBBLES

Medium sized substrate mobilised in moderate to high flows. Habitat on surface and below the cobbles create habitat for different algae and invertebrates.



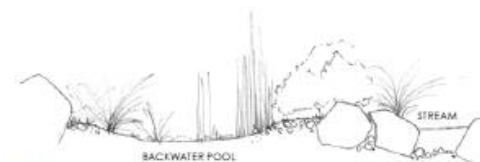
② UNDERCUT BANK FEATURES

To create refuge for fish during daytime and periods of high flow.



③ GRAVEL FANS

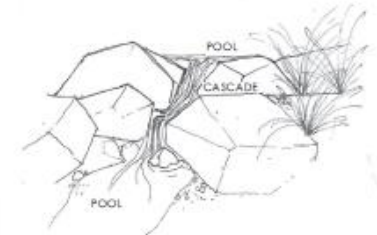
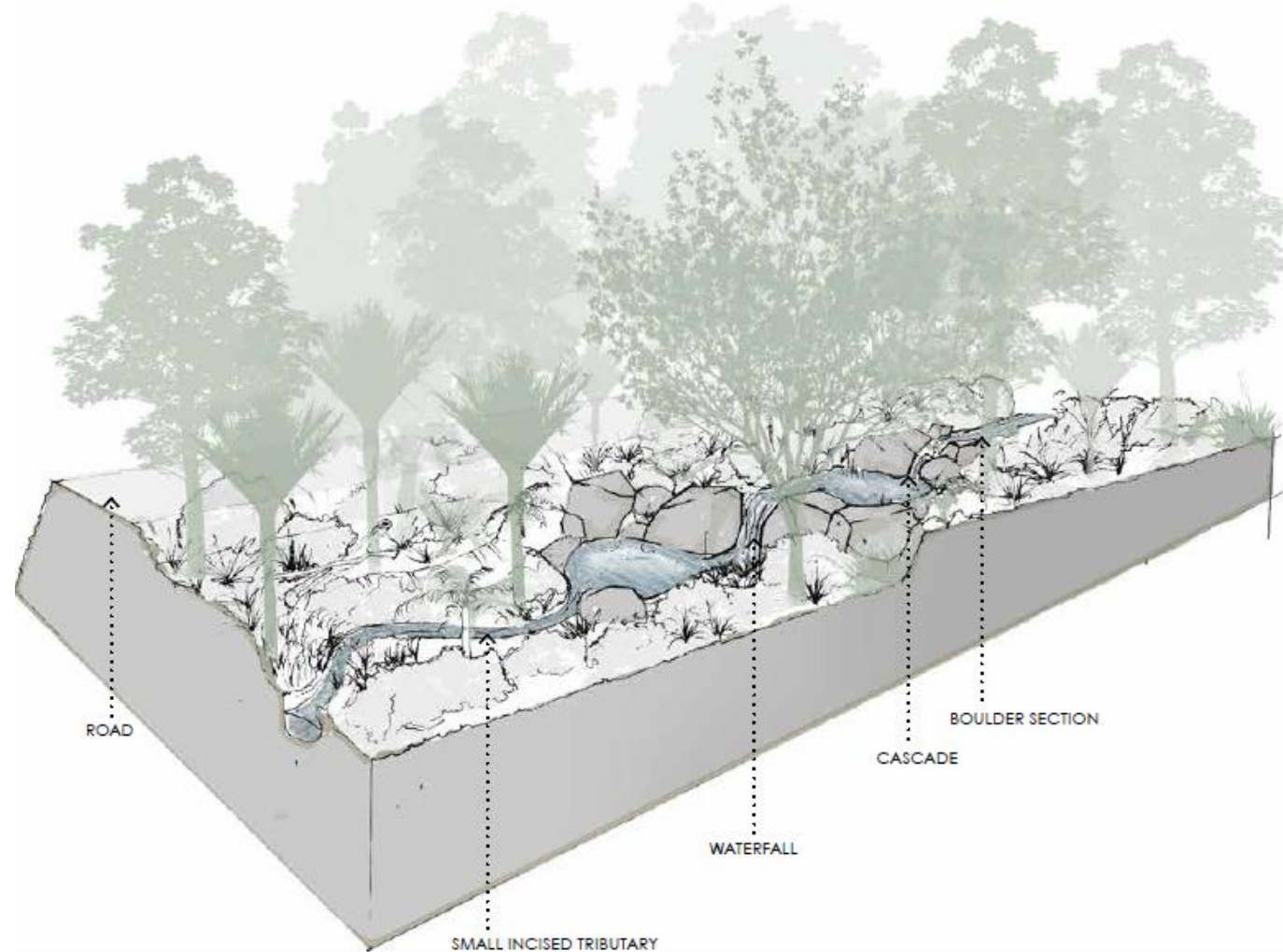
Potential habitat for Hochstetter's frogs, and additional refuge for fish in higher flows.



④ BACKWATER

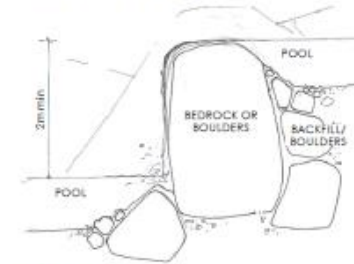
Refuge for fish in times of high flow and source of colonisers as flood waters recede.

Stream Diversion – Boulder substrate section typology



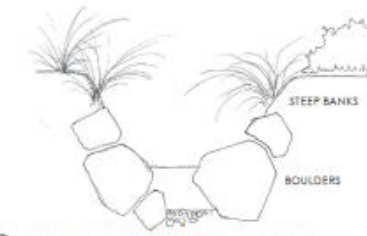
① CASCADE

Series of rapid falls and small pools with variety of habitats and refuge for aquatic organisms in steeper channel gradients.



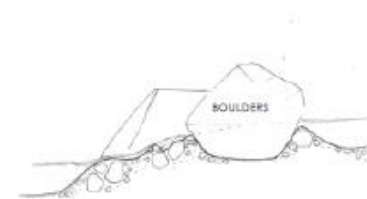
② WATERFALL

Steep fall and plunge pool but available for passage of fish with ability to climb.



③ SMALL INCISED TRIBUTARY

Swift and shallow run section with steeper banks that help create shade.



④ BOULDER SECTION

Large permanent substrate features creating stable microhabitats for algal films and micro-flow variation for habitat.



Complex Freshwater Fisheries Activity

S4 FTAA

complex freshwater fisheries activity means an activity that includes construction of any of the following:

(a) a culvert or ford that **permanently blocks** fish passage:

(b) a permanent dam or diversion structure:
(c) works—

- (i) that require disturbance to a water body, including diversions, in-stream operations, and removal of gravel, **that persists for more than 3 months**; or
- (ii) that require disturbance of any duration during the whitebaiting season to a water body within 500 m of the coast; or
- (iii) that require **disturbance** of any duration **during the relevant spawning season to a water body that is known for the spawning of trout, salmon, or native fish**; or
- (iv) that require repeated disturbance to a water body and are temporary works for which there is a period of 6 months or less between each period of work

- Two culverts (western haul road) blocking fish passage



Reg 42 Freshwater Fisheries Regulations 1983

- s42(4)(j)(i) FTAA

Approval sought due to:

- Steep channel gradient
- High velocities / low flow depths
- Limited suitable upstream habitat
- Minimise disturbance long-term

- Permanent stream diversion channel
- A temporary weir (18 – 24 months) to live in the diversion channel



Reg 43 Freshwater Fisheries Regulations 1983

- s42(4)(j)(ii) FTAA

Dispensation from fish facility sought as:

- fish salvage and relocation is proposed prior to fish passage becoming impeded or blocked

- Fish salvage and relocation (for the culverts and stream diversion)



s26ZM Conservation Act 1987

- s42(4)(j)(iv) FTAA

Approval sought for movement of aquatic life to freshwater systems where these species already exist.

Complex Freshwater Fisheries Activity

FTAA Schedule 9, Clause 5(1)

(a) the purpose of the FTAA

- **Stream diversion** - enabling access to critical aggregate resource, while avoiding the complete loss of that part of the Mangapū Tributary.
- **Culverts** - enabling the most efficient means of accessing the resource

(b) alignment with best practice and the New Zealand Fish Passage Guidelines:

- **Diversion channel / Weir** - designed in accordance with the NZ Fish Passage Guidelines
- **Culverts** – considered NZ Fish Passage Guidelines and determined passage not appropriate. Fish salvage and relocation to follow best practice.

(c) Risk management to freshwater values or habitat:

- **Diversion channel** – gradient, design features (waterfalls/cascades), monitoring and maintenance of riparian vegetation, instream ecological monitoring and an on-going pest management program.
- **Weir** – design features, monitoring and maintenance
- **Culverts** – steep gradients, velocities and flow depth are not suitable for invasive species.

(d) Availability of upstream and downstream habitat

- **Diversion channel** –engineered meanders and design features will assist in generating a high-quality habitat in-channel and maintaining habitat quality up and down stream
- **Weir** – alters downstream habitat but sufficient for fish until salvage and relocation occurs. Intent is to improve ecological outcomes within the channel.
- **Culverts** - mitigation planting improving habitat quality downstream at fish relocation site.

(e) the presence of threatened, data-deficient, or at-risk species

- Tributary 1 (stream diversion) - Longfin eels (At Risk-declining)

(f) Pros / cons of providing fish passage

CONDITIONS

Aquatic fauna salvage and relocation plan

Detailed design

- follow good practice design standards as outlined in the NZ Fish Passage Guidelines Version 2.0 2024
- fish passage objectives and performance standards, incorporating appropriate design standards for target fish

Monitoring and reporting

- SQEP to monitor fish passage success every 1, 2, 4 years post construction – annual reporting
- Process for recommending intervention at various stages if passage unsuccessful

Air Quality - Existing Environment

The existing Air Quality continues to be actively managed, and monitoring over the past 5 years shows generally low dust concentrations.

The primary discharge from the site is nuisance dust, also referred to as Total Suspended Particulate (TSP).

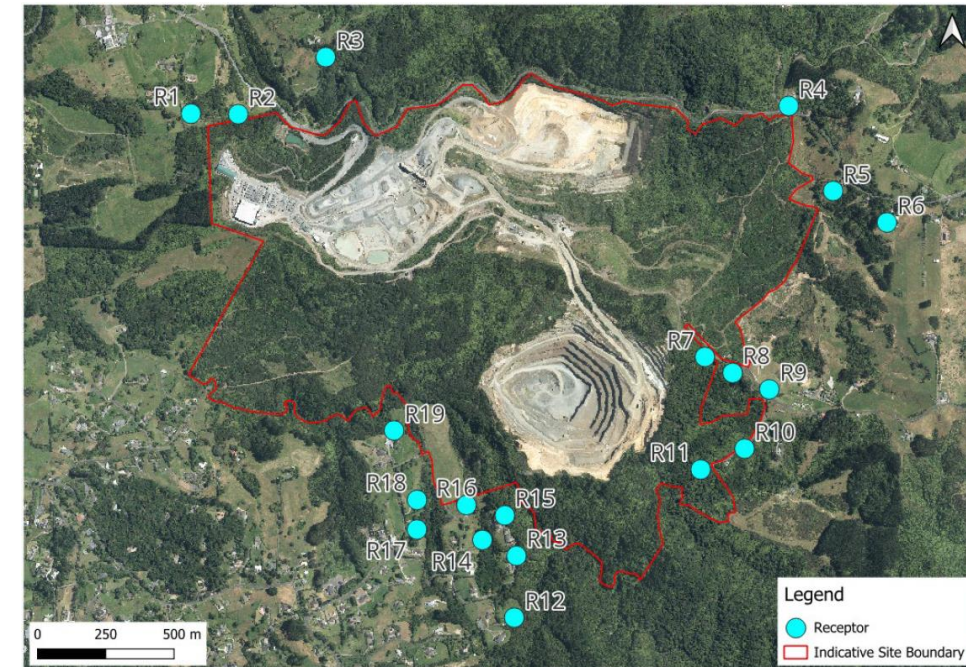
Nearby receptors are mainly rural-residential properties, which PDP considers to be of a moderate to high sensitivity to nuisance dust.

Site activities that can generate dust include extraction, vehicle movements, and overburden removal and placement.

There are three high-quality, real-time TSP monitors and one weather station on site.

Short-term reference-grade PM₁₀ monitoring study.

The monitoring shows low levels of TSP and PM₁₀ concentrations recorded, indicating effective dust management.



From AQA: Figure 4: Nearby Sensitive Receptors

3

Continuous
TSP Monitors

14.3
µg/m³

Average 1-hr Av. TSP
Conc. 2021 - 2025

12
µg/m³

Average 1-hr Av. PM₁₀
Conc. Dec 25 to Jan
26

Low to
Med

Background
Environment
Sensitivity

Med to
High

Receptor
Sensitivity

Air Quality - Effects of the Project

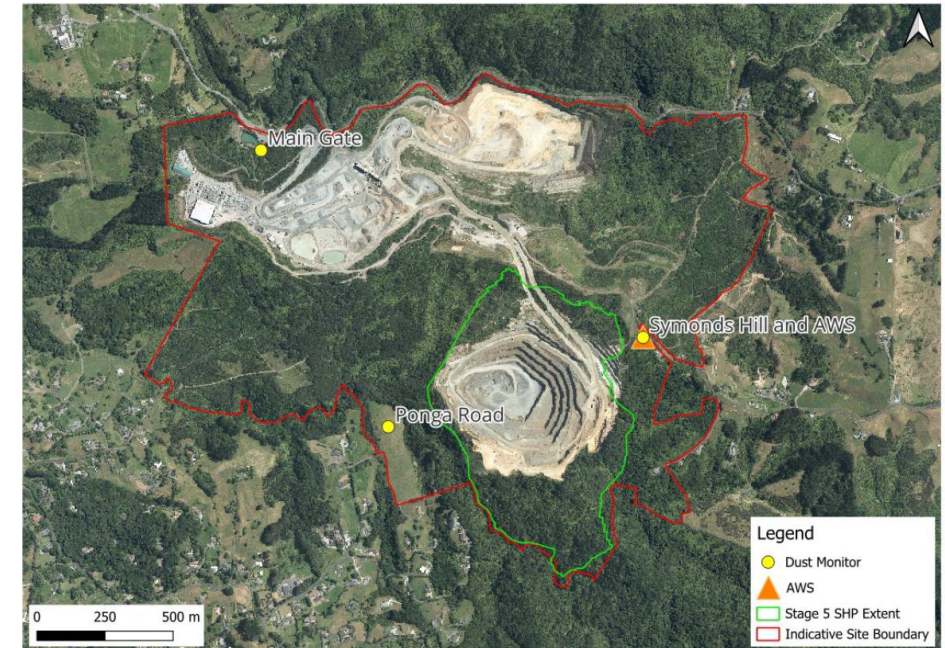
With the proposed mitigation, nuisance dust effects and the health-risk from airborne contaminants are assessed as low to extremely low.

Respirable Crystalline Silica (RCS) emissions were assessed as having extremely low potential for off-site health effects.

PM₁₀ concentrations as a result of the quarry operations will be at a level that will not result in adverse health effects at nearby sensitive locations.

Highest risk of nuisance dust occurs during large-scale overburden stripping near southern receptors.

Cumulative dust effects are unlikely due to separation between source areas.



From AQA: Figure 13: Current Dust Monitor and AWS Location

Extremely Low

Health risk from RCS

Negligible

Health risk from PM₁₀

Low

Risk of nuisance effects from dust.

Highly Unlikely

Cumulative effects

Overburden Removal

Highest Risk Activity

Air Quality - Issues in Dispute

There are no current issues in dispute. PDP is however proposing ambient, RCS boundary monitoring for community piece of mind.

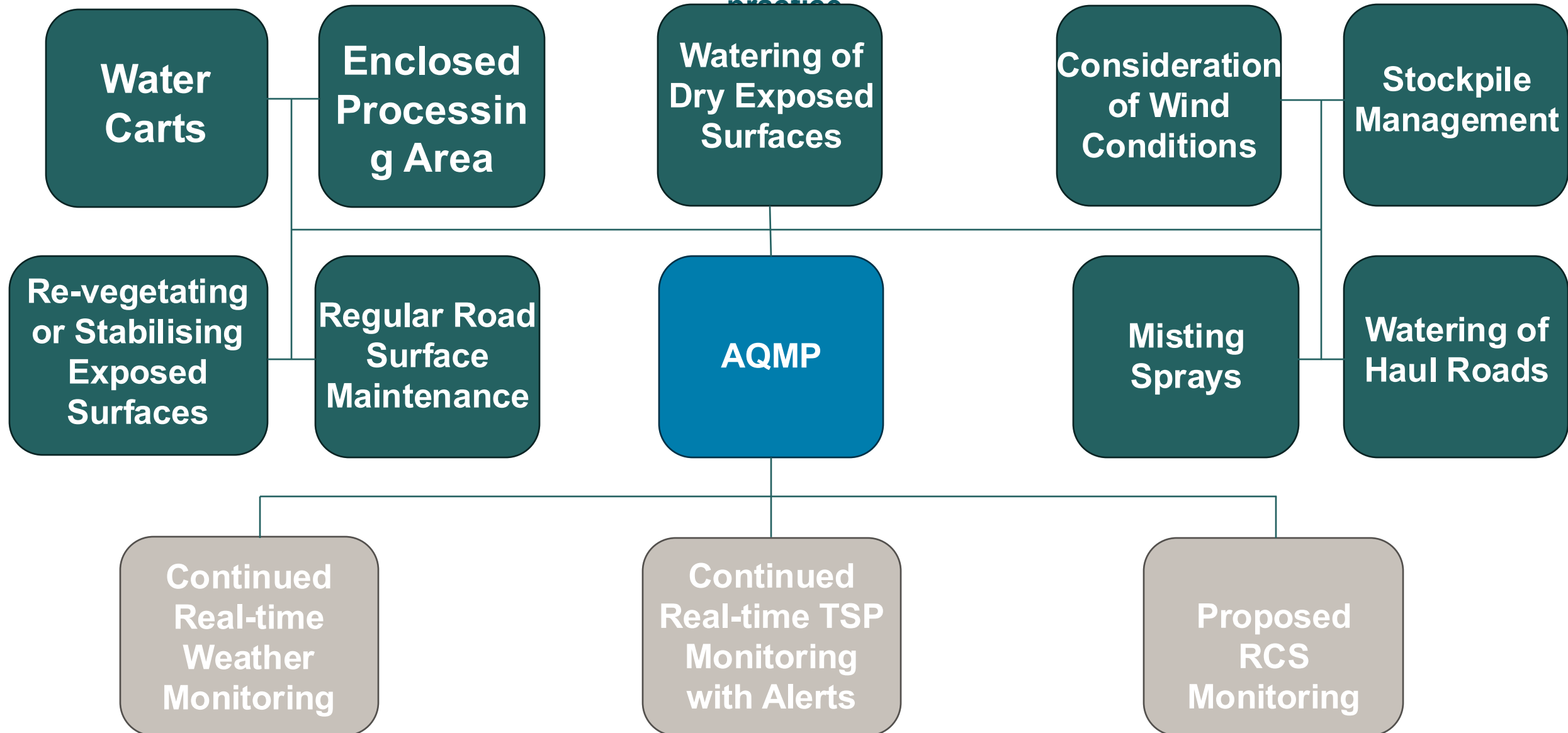
Given there has been no ambient boundary or off-site RCS monitoring undertaken, PDP is proposing to include this to further support assessment which is reliant on on-site monitoring and reviews of other monitoring in NZ.

It is proposed (in the draft consent conditions) to

- (a) Monitor baseline RCS concentrations for at least three (3) months prior to Stage 1 of the project commencing;**
- (b) Monitor for 12 continuous months following Stage 1 of the project commencing;**
- (c) Be designed to assess compliance of 3 $\mu\text{g}/\text{m}^3$ annual average RCS concentration at any nearby dwelling.**

Air Quality - Managing the Effects

The proposed mitigation and monitoring measures are robust and in accordance with industry best practice



Hunua Quarry Development: Groundwater Effects Assessment

BUN60464053, Hunua Quarry FTAA

Dr. Parviz Namjou – PDP
8/7/26

Overview

Basis of Assessments:

Over 20 years of monitoring data, collected through the operation of the Hunua and Symonds Hill Pits. This long-term dataset gives us a unique and robust understanding of how groundwater behaves in fractured greywacke.

What I will cover:

- **the existing environment and conceptual model,**
- **the predicted effects of the proposed development,**
- **and the proposed monitoring and mitigation framework.**

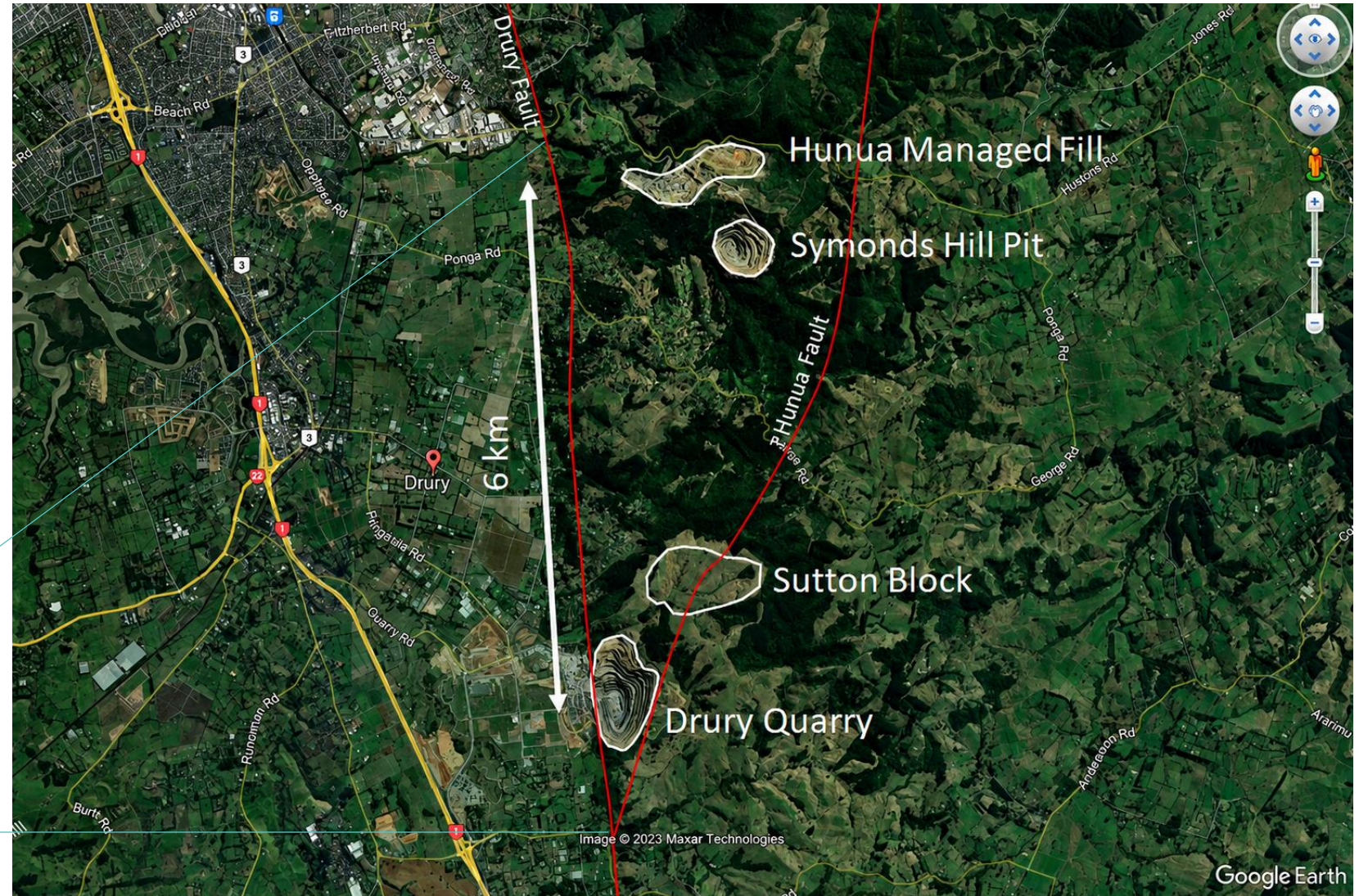
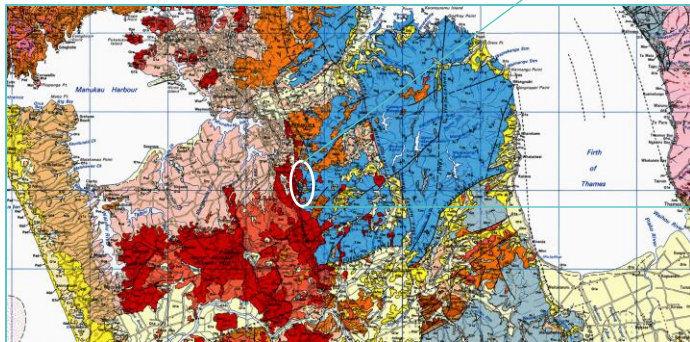
Location Plan

Hunua Quarry:

- Hunua Pit
- Symonds Hill Pit

The Hunua Pit has been quarried for over 100 years. Extraction has now ceased, and it is being backfilled.

Operational focus has shifted to the Symonds Hill Pit for the past 15 years.



Existing Takes and Consents

Existing Consent (WAT60152106-A):

- **Total take: 5,340 m³/d**
- **Dewatering: 3,000 m³/d**
- **Quarry operations: 2,000 m³/d: The current quarry water supply comes from bore HUN14/8 near Coal Mine Road, and the Symonds Hill Pit sump.**
- **Shallow groundwater: 340 m³/d**

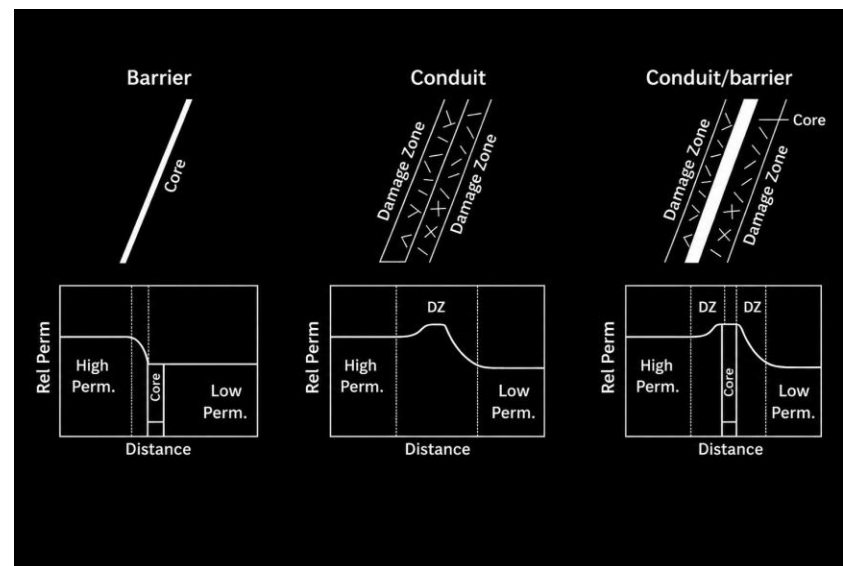
Existing Augmentation Plan:

An augmentation programme is already in place to maintain stream baseflows. And water quality monitoring shows that current operations are not having a measurable adverse effect on streams.

Exiting Environment – Complexity of GW Movement in Greywacke

A. Faults Hydraulic Properties

- Conduit/Barrier Faults
- Variable Characteristics
- Dormant Barrier Faults

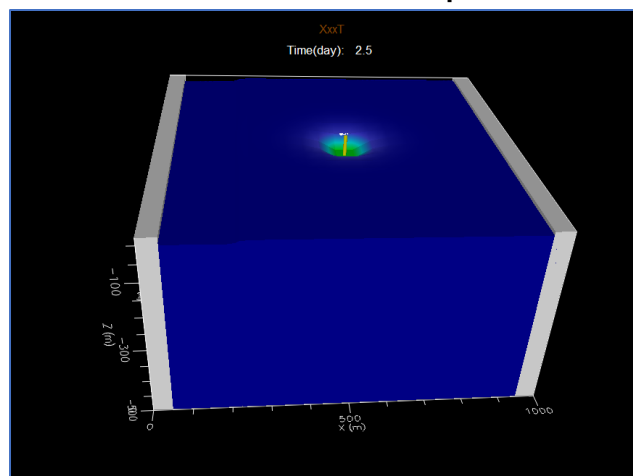


B. Cone of Depression

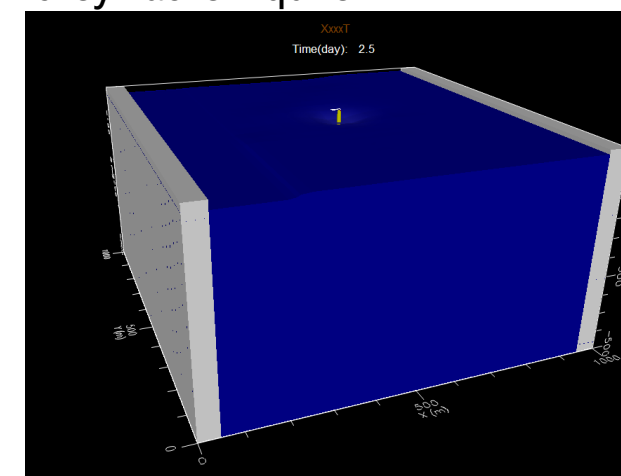
C. Shallow and Deep Groundwater

- Two groundwater systems (shallow perched + regional deep)
- Shallow Groundwater has remained unaffected

Uniform Aquifer or Randomly Distributed Fractured Aquifer

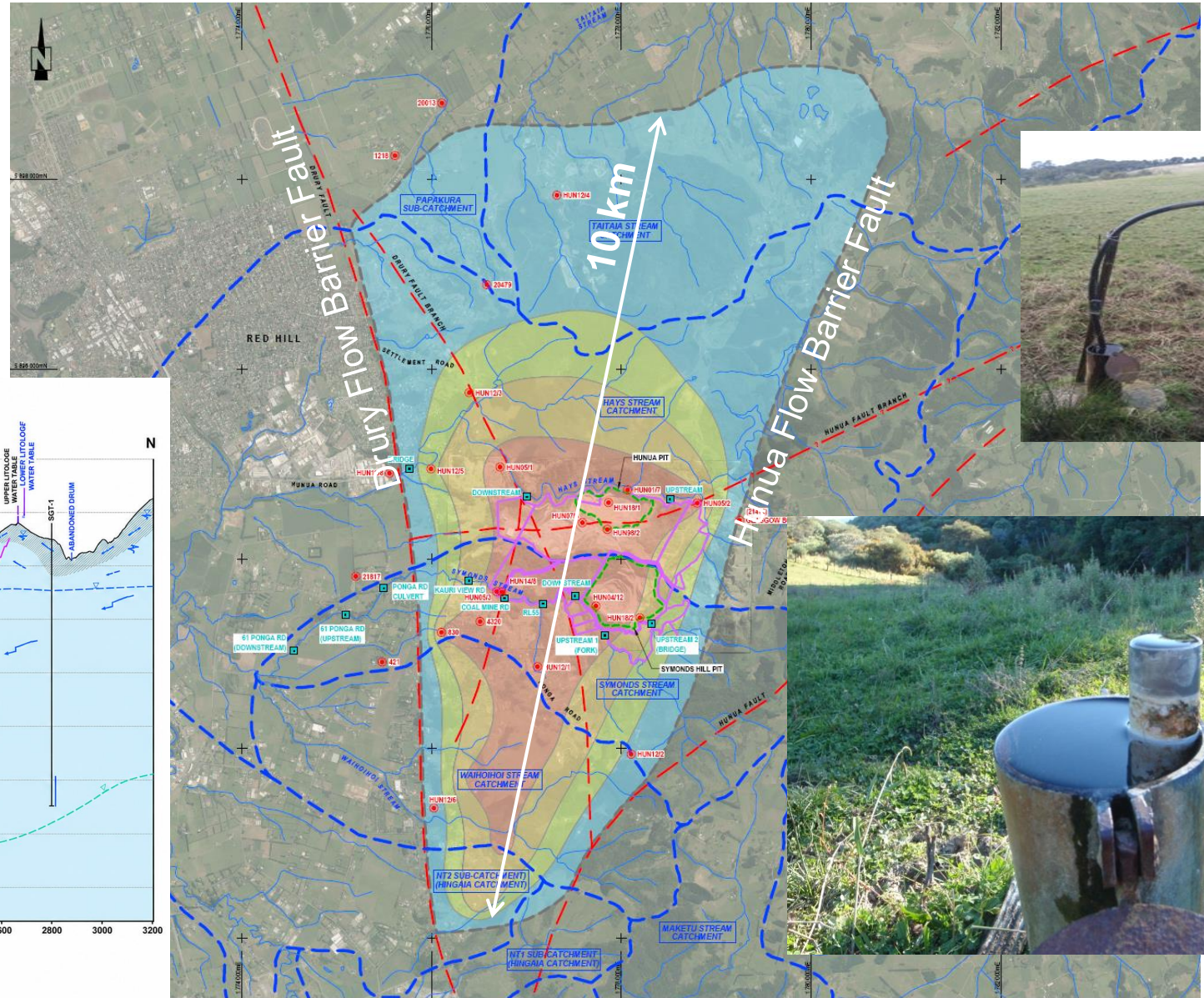
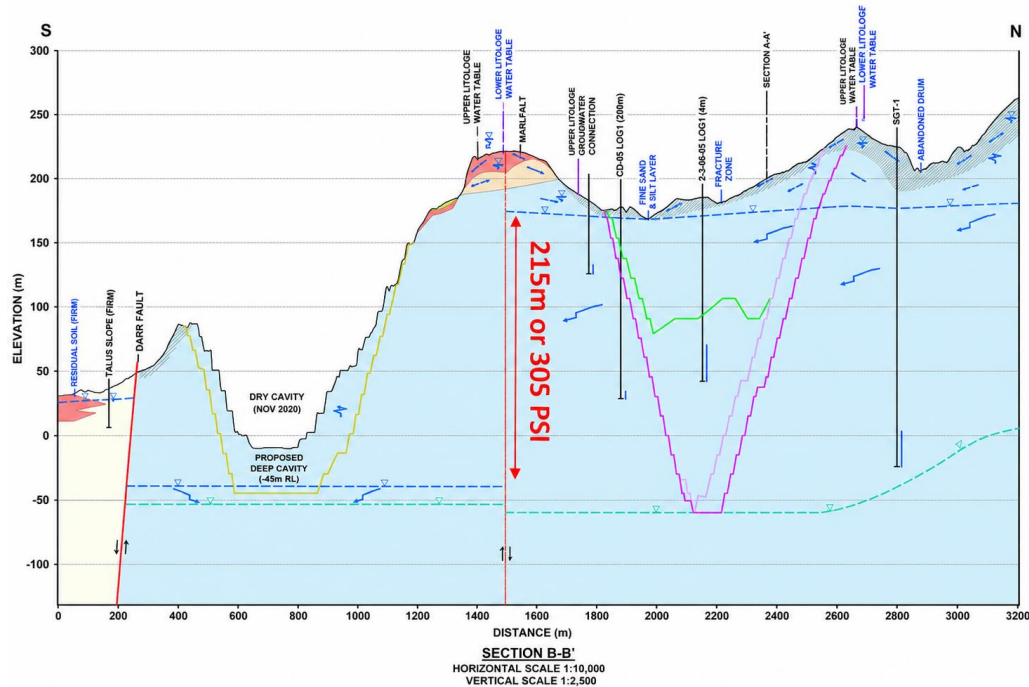


Fractured Greywacke Aquifer



Existing Environment: Hunua Greywacke Block PATTLE DELAMORE PARTNERS

- Groundwater Pressure Distribution
- 70 Piezometers
- Long-Term Monitoring
- 215 m drop in hydraulic head



The Proposal

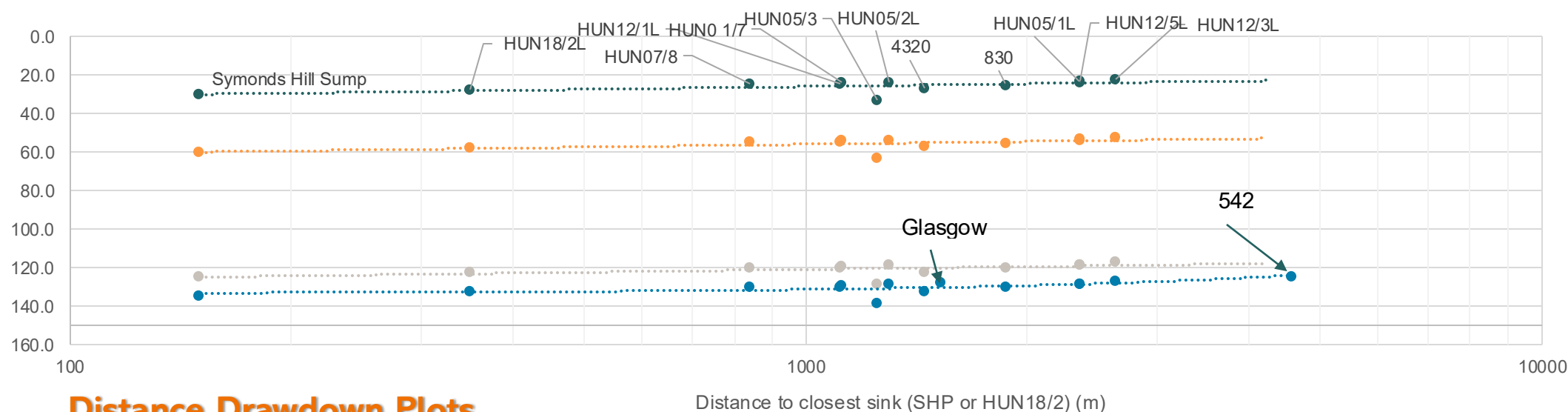
- **Deepen pit from RL-5m to RL-50m**
- **Minor change in total take (+9%)**
- **Zone of influence unchanged (bounded by faults)**
- **Same geological boundaries control the ZOI**

Aspect	Existing	Proposed	Change
Pit Floor Level	RL -5m	RL -50m	Deeper by 45m
Total Take	5,340 m ³ /d	5,820 m ³ /d	+9%
Zone of Influence	31 km ²	31 km ²	Unchanged
Affected Bores	9	19	10 newly identified

Predicted Effects – Groundwater Inflow and Drawdowns

- Total inflow/take: 5,820 m³/d
- Regional inflow: 4,520 m³/d
- Shallow groundwater: 300 m³/d
- Storage release: 1,000 m³/d (potential)

- Drawdowns: Up to 138m in monitoring bores (*worst-case*)
- 19 farm wells within the ZOI
- All are classified as Permitted Activities
- Mitigation available (as per existing consent - deepening, pump lowering, alternative supply)



Distance Drawdown Plots

● RL45 ● RL15 ● RL-50 ● RL-50 with Sutton Block

Predicted Effects on Stream Baseflow

Net change in baseflow loss across all catchments: +394 m³/d (9.5%)

This is a **minor increase** compared to the existing consent

- **Reason 1:** The zone of influence is unchanged - it is controlled by the same geological boundaries
- **Reason 2:** Hydraulic disconnection between regional groundwater and streams has already occurred under the existing consent (at RL-5m). Therefore, further deepening does not proportionally increase baseflow loss

Changes in Flow Loss Compared with the Existing Consent

Catchment	Predicted Reduction in Baseflow for Existing Consent (m ³ /d)	Predicted Reduction in Baseflow for Proposed Development (m ³ /d)	Change (m ³ /d)	Percentage increase in flow loss (%)
Taitaia	311	549	238	76.5
Waipokopu	2099	2290	191	9.1
Mangapū	1053	946	-107	-10.2
Waihoihoi	564	610	46	8.2
Hingaia	76	89	13	17.1
Papakura	23	36	13	56.5
Total	4127	4520	394	9.5

A) Groundwater

Schedule A Summary	
Monitoring Component	Details
Deep Greywacke Bores	15 bores monitoring regional groundwater drawdown
Shallow / Perched Bores	12 bores monitoring shallow groundwater (no effects expected)
Private Farm Wells	4 bores monitored (with landowner access)
Trigger Levels	Set at predicted drawdown + seasonal variation
Contingency	If trigger exceeded → investigate → mitigate

- **40+ monitoring bores**
- **Drawdown trigger levels**
- **Adaptive management approach**

Proposed Monitoring and Mitigation Framework

B) Streams Flow Monitoring

C) Stream Flow Augmentation

Augmentation Sites:

- Waipokapū Stream (Downstream Site)
 - Mangapū Stream (RL 55 Site)
 - Mangapū Stream (Upstream-2 Site)
 - Mangapū Stream (Diversion-1 Site)
-
- The trigger is a 5% drop below MALF – Natural variability threshold
 - Drought conditions are excluded by adjusting the trigger based on the upstream reference site. This is a proven, conservative framework

Mangapū Stream (8 Gauging Sites)

Upstream1 (Fork)

Upstream2 (Bridge)

Diversion-1 (New)

Downstream

RL 55

Coal Mine Road

Kauri View Road

Ponga Road Culvert

Waipokopu Stream (5 Gauging Sites)

Upstream Site

Downstream Site

Bridge Site

RL 40 (New)

Reference Site

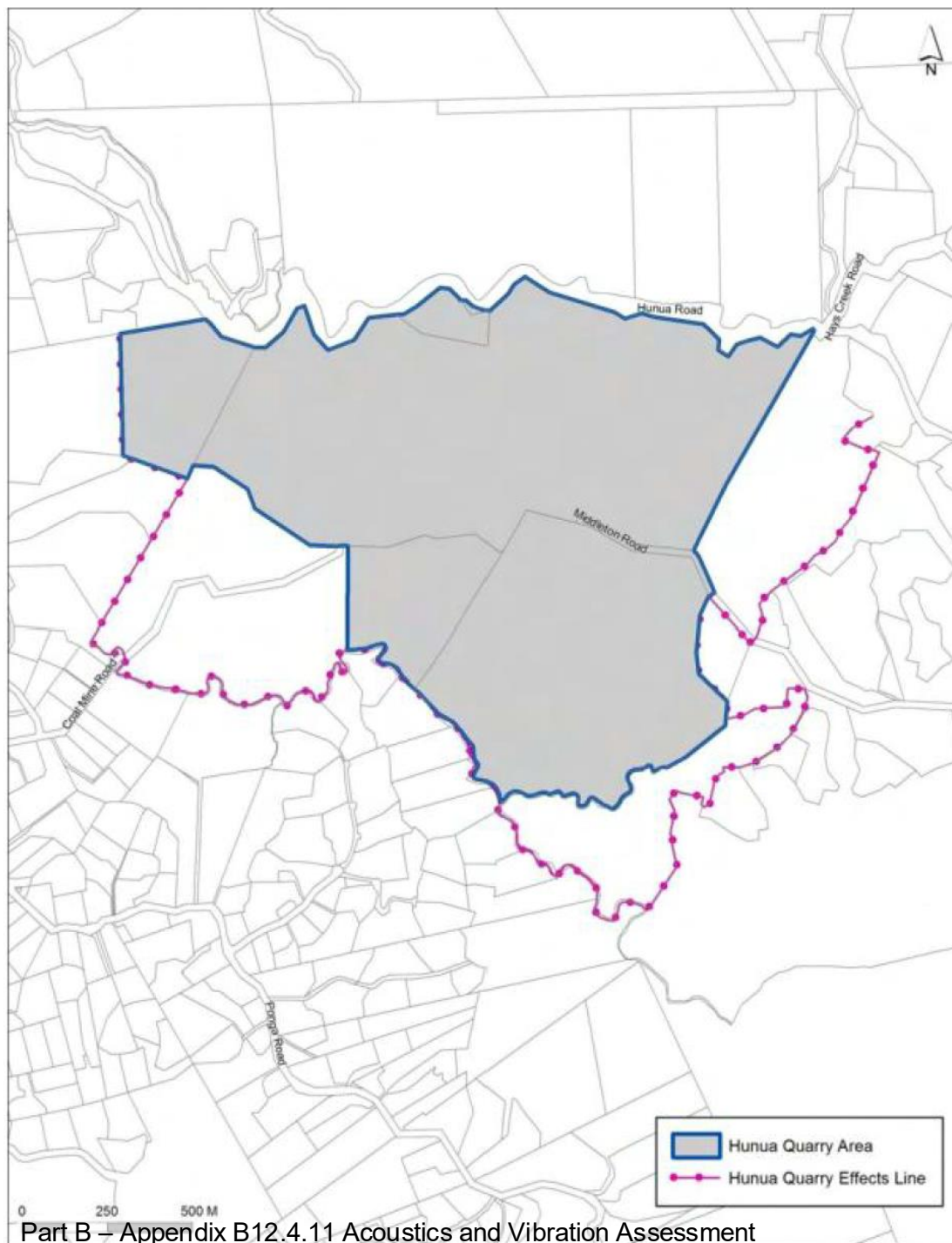
Mangawheau Stream (08529)

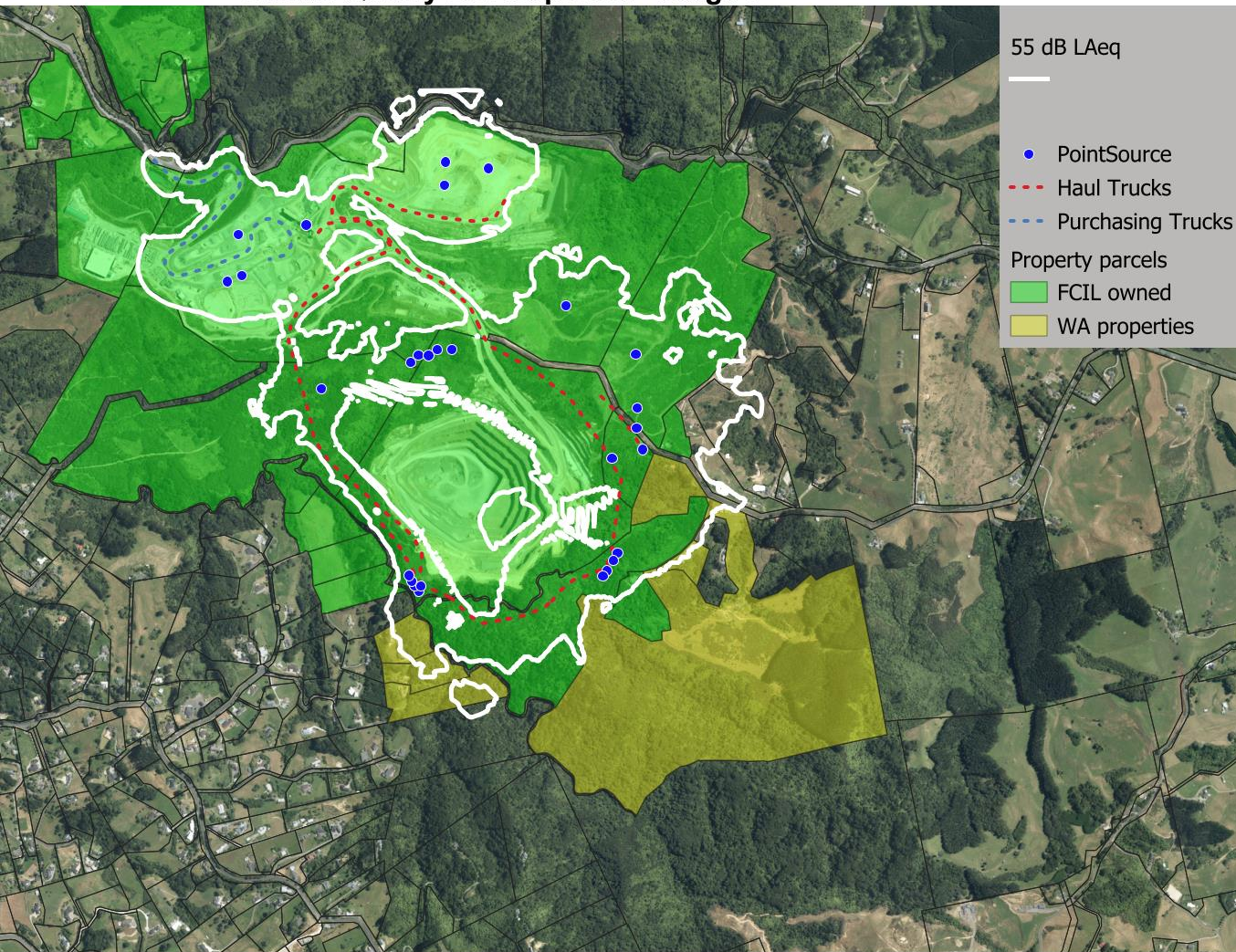
Summary and Conclusion

- **No change to maximum ZOI**
- **Drawdown magnitudes increase – but conservatively assessed**
- **All effects can be managed through proposed monitoring and mitigation**
- **Residual effects after mitigation: less than minor**

Existing Environment

- Noise from:
 - Drilling, blasting, loading and transport of rock
 - processing plant
 - overburden stripping and disposal
 - Occasional construction work (drainage, haul road works etc)
- Operational limits
 - 55dB L_{Aeq} daytime (7am-6pm Mon-Fri + 7am-4pm Sat)
 - 45dB L_{Aeq} and 75dB L_{AFmax} at all other times
 - Only at notional boundaries existing at 1 January 2001And
 - 65dB L_{Aeq} and 75dB L_{AFmax} at the **Quarry Effects Line**
 - Overpressure and vibration limits from AUP
- Receivers
 - A mix of houses that existed prior to 1 January 2001 and a smaller number built subsequently





Effects of the Project

- Continued compliance with overpressure and vibration controls in AUP (including lower limits for blasting in the RMRZ)
- Noise limits for quarrying, overburden stripping and disposal and all processing
 - 7:00 am to 6:00 pm on Monday to Friday: 55 dB L_{Aeq}
 - 7:00 am to 4:00 pm on Saturday: 55 dB L_{Aeq}
 - All other times: 45 dB L_{Aeq} and 75 dB L_{AFmax}
- These apply at all notional boundaries (not just pre-2001)
- Quarry Effects Line no longer relevant
- Predicted noise contours are based on current fleet. ONMVP will manage noise emissions proactively as fleet renews and operations develop
- Consistent with the character, timing, duration, and frequency of noise emissions that are enabled by the AUP in the SPQZ and between sites in rural zones
- Noise levels above 55 dB LAeq no longer be enabled at the nearest notional boundaries, which is an improvement for the receivers
- Duration of noise from the quarry will be extended due to the additional years of quarrying in the expansion areas.



Modelling, Construction & Blasting

- **Computer noise modelling** work has been informed by Cetaware™ measurement and analysis
- Tens of thousands of plant measurements captured and analysed before inputting to noise model. Noise model very robust as a result.
- **Construction** activities are minimal and will most often be undertaken using quarrying plant
- Overburden stripping is often classed as construction work in other proposals but in this case we have included it in the operational noise limits
- **Construction** work will comply with AUP noise and vibration limits by a significant margin in all cases. Effects will be very intermittent and mostly indistinguishable from everyday activity (except for example, vegetation removal)
- **Blasting** will be controlled more tightly than currently, with overpressure and vibration limits at all receivers (not just pre-2001)
- Proposed blasting limit conditions clarify uncertainties in AUP limits and remove pre-2001 limitation
- **Blasting** overpressure and vibration effects will be similar to effects currently experienced



Issues in Dispute

- None

Managing the Effects of the Project

- Operational Noise and Vibration Management Plan (ONVMP)
- ONVMP will manage noise proactively but also includes provisions for reactive management
- Requires regular noise monitoring to monitor and manage compliance
 - Stage 1 – within 6 months of commencement
 - Stage 2 – during construction works associated with the stream alignment
 - Stage 4 – when operational activities are within 400 m of the nearest receiver
 - Stage 7 – when operational activities are within 400 m of the nearest receiver
 - Stage 8 – when operational activities are within 400 m of the nearest receiver
 - Periodically throughout the life of the quarry to check compliance with operational, construction, and blasting noise limits
 - In response to any reasonable complaint received by Auckland Council or made directly to Hunua Quarry
 - To test the noise levels generated by new plant, machinery, or vehicles
 - To test the effectiveness of mitigation implemented for compliance with the noise limits
- Provides for fleet renewal and development of each Stage
- Objective is to manage noise and vibration to be compliant with the approval conditions at all times

StylesGroup
Acoustics & Vibration Consultants

HUNUA QUARRY DRAFT ONMP

OPERATIONAL NOISE & VIBRATION MANAGEMENT PLAN

PREPARED FOR
Winstone Aggregates

DATE
30 March 2026

STYLES GROUP
ACOUSTICS & VIBRATION

Cultural Engagement – Identified groups

Iwi authorities (s53(2)(b))

- Ngāti Tamaoho Settlement Trust
- Ngāi Tai ki Tamaki Trust
- Te Ākitai Waiohū
- Ngāti Te Ata Claims Support Whānau Trust
- Ngāti Paoa Iwi Trust
- Te Whakakitenga o Waikato Inc
- Ngaati Whanaunga
- Ngāti Tamaterā Settlement Trust
- Ngāti Maru Rūnanga Trust
- Hako Tupuna Trust

Treaty settlement entities (s53(2)(c))

- Ngāti Tamaoho
- Ngāi Tai ki Tamaki Trust
- Ngāti Paoa
- Tāmaki Collective
- Waikato-Tainui
- Te Ākitai Waiohū
- Marutūahu Iwi Collective
- Ngaati Whanaunga
- Ngāti Tamaterā
- Ngāti Te Ata
- Ngāti Maru (Hauraki)

Those underlined are members of Kaitiaki Forum.



New Lynn

Onehunga

Titirangi

Manukau

Clevedon

Kawakawa Bay

Manukau
Harbour

Firth Of
Thames

NGĀTI PAOA

NGĀTI TE ATA

TE ĀKITAI WAIOHUA

NGĀTI TAMAOHO

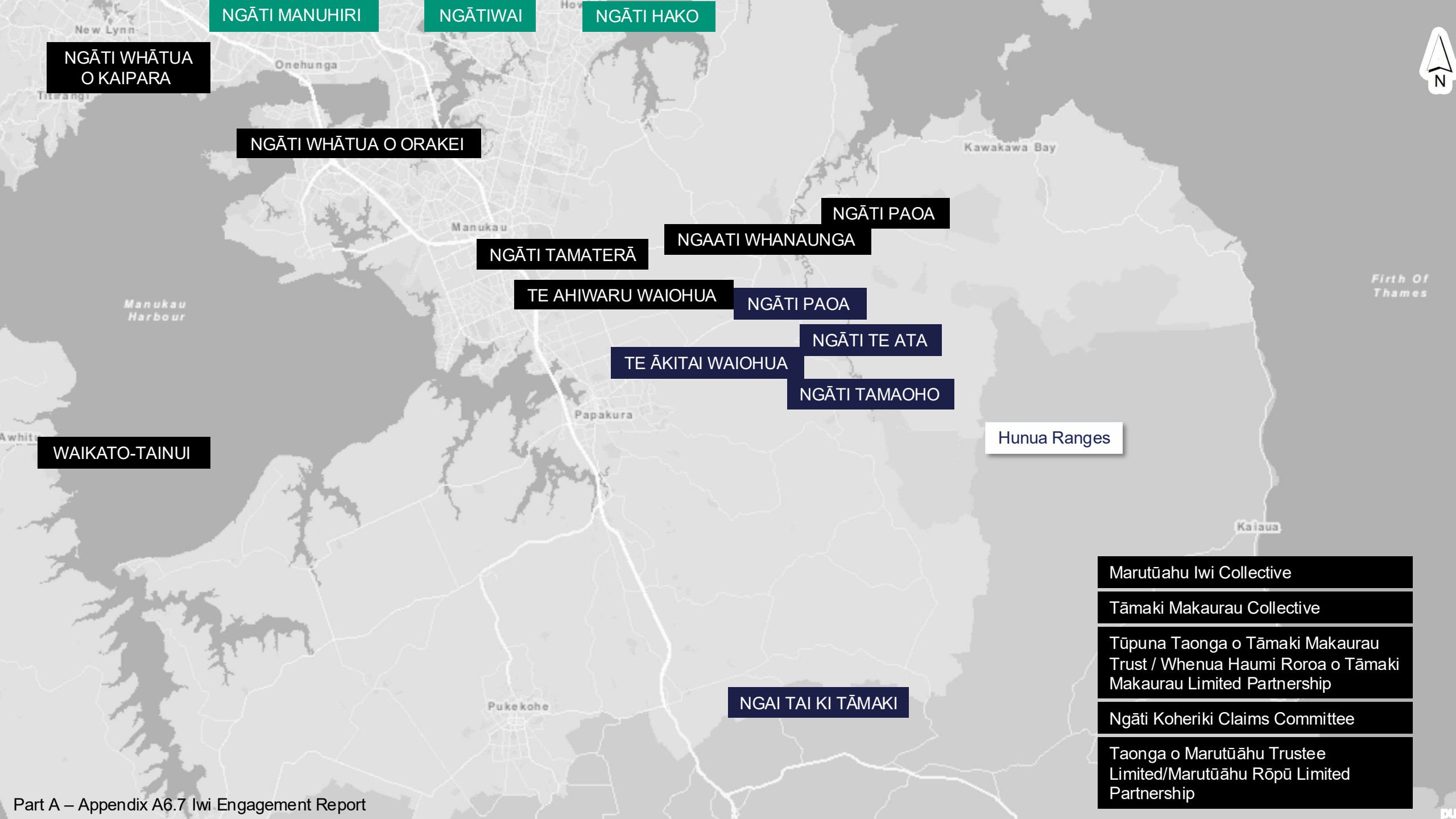
Hunua Ranges

Papakura

Kalua

Pukekohe

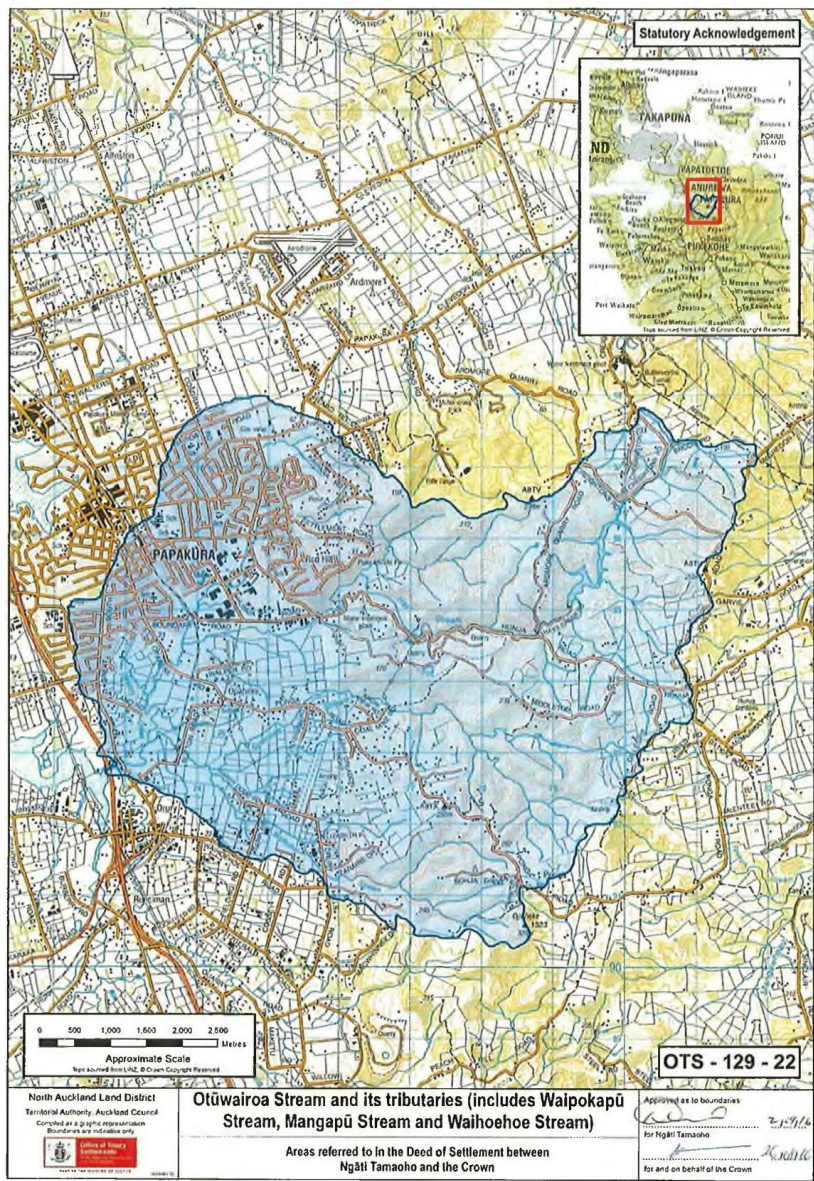
NGAI TAI KI TĀMAKI



Cultural Engagement – Statutory Areas

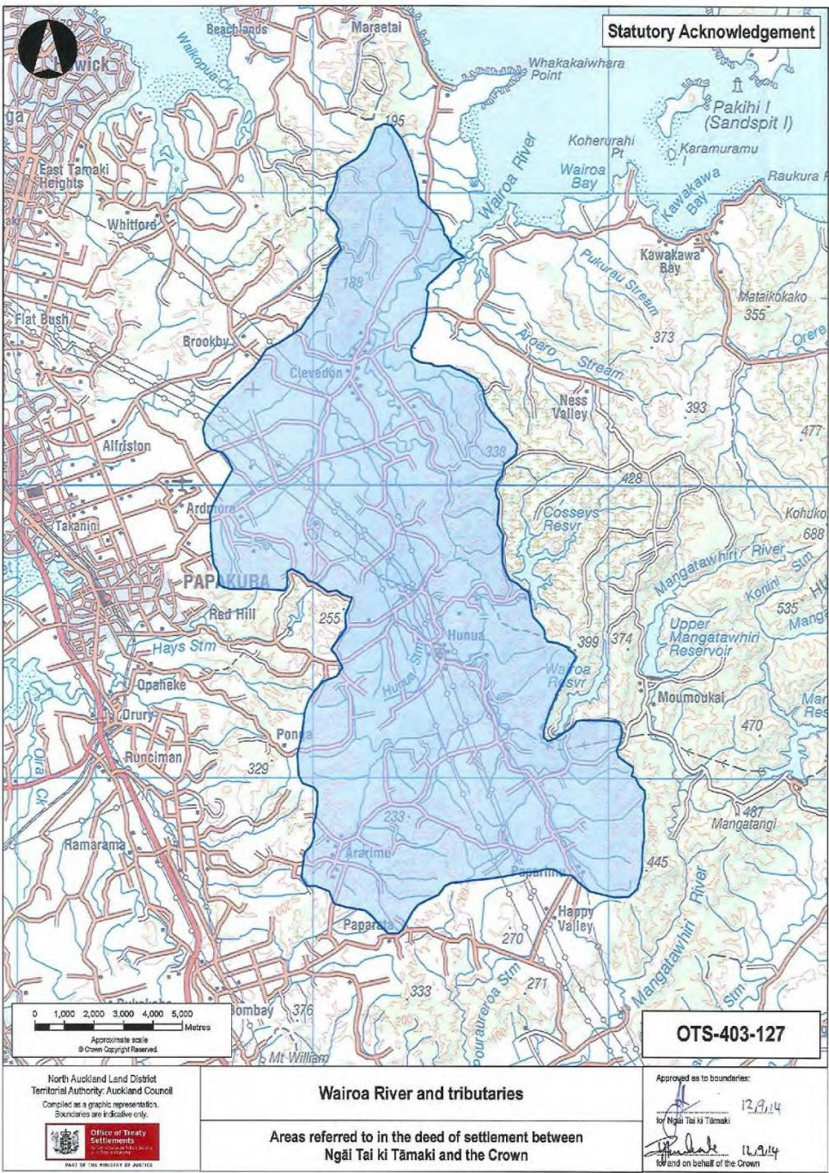
Ngāti Tamaoho

Otūwairoa Stream and its tributaries (OTS-129-122).



Ngāi Tai ki Tamaki

Wairoa River and its tributaries (OTS-403-127).



Cultural Engagement – Matters raised

Mana whakahaere, mana whenua and kaitiakitanga

- Continued recognition of connection, role as kaitiaki, tikanga and iwi expert knowledge.

Mangapū stream and wai

- protecting the mauri, ecological health and function of waterways and taonga within.

Archaeology

- archaeological values extend beyond physical artefacts to include mātauranga, tikanga and the knowledge held by mana whenua.

Cultural landscapes

- Rehabilitation and planting with iwi.

Ecology

- safeguarding taonga species, biodiversity, restoration and ecological connectivity.

Cultural heritage

- recognising cultural landscapes, whakapapa, wāhi tuku iho and archaeological values.

Project design

- stream diversion, mitigation, monitoring and long-term rehabilitation.

Ongoing engagement

- continued partnership, information sharing and cultural involvement.

Cultural Engagement – Conditions

Kaitiaki Forum

- Draft conditions 13-18
- To facilitate ongoing engagement with invited hapū with mana whenua

Management and Monitoring Plans

- Draft condition 23(e)
- To summarise comments received from mana whenua

Archaeological ADP

- Draft condition 96

Archaeological Authority

- Part H
- Includes Ngāti Tamaoho, Ngāti te Ata, Te Ākitai Waiohua and Ngāi Tai ki Tāmaki