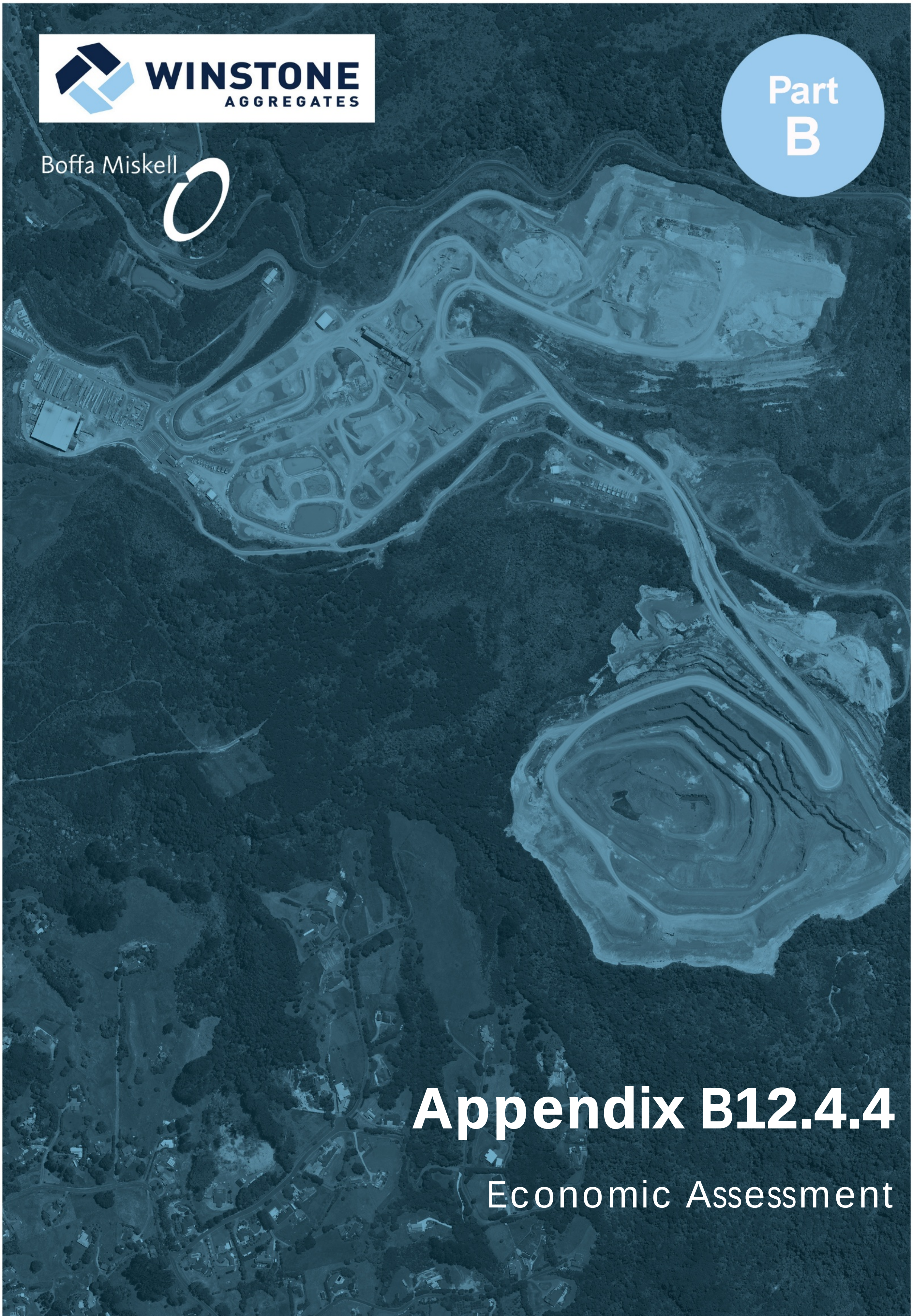

Part B

Appendix B12.4.4

Economic Assessment

Hunua Quarry Expansion

Economic Assessment

27 March 2026 –Final

Hunua Quarry Expansion

Economic Assessment

Prepared for

Winstone Aggregates

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Director approval:	Greg Akehurst [redacted]

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Executive Summary

The New Zealand economy is reliant on the availability of natural mineral resources such as aggregate. The extraction and use of aggregate enables urban development and construction, supporting the economy and providing homes, infrastructure and amenities for people. Aggregate is used in a wide range of applications within the Auckland economy, and it is used throughout the urban environment to meet the needs of residential, business, infrastructure and road construction requirements. Given the importance of aggregate for Auckland's economy, Auckland's built future is effectively reliant upon maintaining sustainable sources of aggregate.

The Issue

Hunua Quarry currently plays a key role in providing aggregate for the Auckland market as one of three major quarries that account for the majority of Auckland's supply. For the last 15 years at least, Auckland has been in an aggregate shortfall. Demand has consistently outstripped supply, meaning rock has had to be transported into the region at significant cost from the Waikato Region or Northland. Auckland is also New Zealand's largest growing market, adding between 20,000 and 25,000 residents every year and is expected to account for between 40% and 50% of national growth over the next few decades. This will see the current shortfall (without additional consented supply) grow from around 2m tonnes annually today to between 6.2m tonnes and 9.0m tonnes by 2055 (simply by increasing demand proportionally with Stats NZ medium or high population growth projections).

Figure 1: Auckland Region Aggregate Demand and Supply, 2026 – 2055 (million tonnes)

Medium Growth	2026	2030	2035	2040	2045	2050	2055
Aggregate Demand	16.7	17.6	18.6	19.7	20.7	21.7	22.6
Auckland Agg. Supply	14.6	16.4	16.4	16.4	16.4	16.4	16.4
Shortfall	**-2.1**	**-1.2**	**-2.2**	**-3.3**	**-4.3**	**-5.3**	**-6.2**

High Growth	2026	2030	2035	2040	2045	2050	2055
Aggregate Demand	16.9	18.1	19.6	21.1	22.5	23.9	25.4
Auckland Agg. Supply	14.6	16.4	16.4	16.4	16.4	16.4	16.4
Shortfall	**-2.3**	**-1.7**	**-3.2**	**-4.6**	**-6.1**	**-7.5**	**-9.0**

There are two ways to reduce the shortfall within Auckland. Either new aggregate sources within the region need to be identified and brought to market, or, more efficiently, existing established quarries must be allowed to expand. While Hunua Quarry is well placed to help address this growing shortfall, its consented rock reserves will be exhausted by 2039. This means that, unless Hunua Quarry is further developed, the Auckland Regional aggregate shortfall will increase by an average of 2.8 million tonnes annually, growing from 6.1m – 7.4m tonnes (2040) to between 9m and 11.8m tonnes by 2055 (in the absence of new supply being consented[1]).

If the shortfall increases, it will have the effect of increasing Auckland building and infrastructure costs, increasing greenhouse gas emissions as transportation increases significantly and increasing social costs as vehicle accident rates increase. The Auckland economy will be less efficient which means New Zealand, overall, will be less efficient.

The Project

The Hunua Quarry Development (the Project) is a listed project under the Fast-Track Approvals Act 2024. The Project will see the existing quarry developed to enable annual production to increase from an average of 2.72 million tonnes up to a peak of 5.4 million tonnes; and to enable aggregate extraction over the longer-term horizon (up to 80 years with additional regional consent renewals). Aggregate that will be extracted from the further development of the quarry pit will positively contribute to securing Auckland's future aggregate supply while addressing a portion of the current aggregate shortfall.

The Project will secure the continuation and development of Hunua Quarry, a significant business employing 46 workers on site, plus support workers in Penrose at Fletchers HQ and between 20 and 40 contractors on site at any one time. The business turns over more than [redacted] annually, paying taxes, wages and salaries, and intermediate suppliers across Auckland.

The Fast Track Approvals Act ('FTAA 2024')

The purpose of the FTAA 2024 is to *"facilitate the delivery of infrastructure and development projects with significant regional or national benefits"*. The panel must weigh up the purpose of the FTAA, including the extent of the Project's regional or national benefits compared with any adverse impacts, in reaching its decision (sections 81(4) and 85(3)).

The FTAA does not prescribe quantitative thresholds for "significant economic benefits". Significance is inherently contextual but is best thought of as an indicator of scale, rather than if an entire regional economy moves significantly. Therefore, the purpose of this report is to quantify the regional economic benefits of the Project and to provide guidance as to their significance to help inform the panel.

Economic Benefits of the Project

The economic benefits of the Project fall into three broad areas:

- Benefits associated with the expenditure required to extend the quarry – these are similar in nature to construction-related benefits of development or infrastructure projects;
- Benefits associated with the continuation of Hunua Quarry as an existing business and the value of aggregate able to be extracted; and

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[1] I have included recently consented new additional aggregate production at Brookby (2.6m tonnes), Drury Sutton Block (1.3m tonnes) and Kings Quarry Stage 2 (0.5m tonnes) in the supply estimates.

- Benefits associated with a range of avoided costs for the Auckland economy. These are transportation costs, emissions costs, and social costs.

There are also a range of benefits not able to be quantified numerically that arise should the proposed Hunua Quarry Development be granted consent under the FTAA. These include the security of supply of aggregate and the benefits of a more efficient economy.

In addition, this report itemises the benefits associated with a project that forms part of the wider Hunua Quarry Development – the development of a new haul route that significantly reduces both time and fuel cost to move rock from the extended pit to the processing facilities.

Project Expenditure Effects

The development of the Project requires Winstone Aggregates to spend money on groundworks (stripping and clearing), the purchase of plant and machinery, the development of the new haul road and ecological restoration over the next 5-10 years. All of this work sustains employment and flows through the Auckland economy generating indirect and induced effects (those effects associated with the spending of wages and salaries). Once discounted back to current terms at 5%, the Project generates some [redacted] Value Added in the Auckland Region and a total of [redacted] at the national level.

[redacted]

[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Quarry as a Business and Aggregate Value

Hunua Quarry is a significant business turning over more than [redacted] annually. The aggregate resource that the Project liberates is a valuable resource. While the average gate price for aggregate in Auckland sits at around $24/tonne, this still means the quarry will turnover more than [redacted] annually at 3.3m tonnes of production (under a high production future). Under that same high production future, the Project is anticipated to yield over [redacted] million tonnes of aggregate in total, which translates into a resource value of over [redacted] dollars.

Avoided Costs – Transport, Emissions, Social

Avoided costs are benefits to the Auckland economy. By ensuring aggregate is available close to where it is ultimately to be used, this minimises costs. As a low value, high volume product, aggregate does not travel far before it becomes uneconomical to use. Without Hunua, and given Auckland is in an aggregate deficit, rock needs to be brought in from either the Waikato Region, or Northland Region to service demand. The distances involved are significantly greater and therefore the costs are significantly higher.

We assume that Smythes Quarry in the Waikato, is able to meet any shortfall if Hunua Quarry is not further developed – (it is the closest quarry in Waikato Region) and is therefore the principal alternative. Under this assumption, Hunua Quarry delivers Transport, Emissions and Social Cost benefits to the Auckland Region of between $693m and $889m ($PV_{5\%}$)[2]. If aggregate needed to come from further afield, the costs increase. For example, providing the aggregate from Northland (Maungaturoto Quarry) increases the costs to between $1.80bn and $2.31bn ($PV_{5\%}$)

Figure 3: Transport, Emissions and Social Cost Savings Low, Medium and High Production ($m $PV_{5\%}$)

Cost Category	Low	Mid	High
Transport Savings	$467	$478	$600
Social Cost Savings	$20	$20	$25
Emission Cost Savings	$206	$211	$264
Total Benefits	**$693**	**$709**	**$889**

Qualitative Benefits

A range of qualitative benefits sit alongside the monetised benefits. They include;

- **Supply chain resilience.** Hunua Quarry's continuation preserves one of Auckland's three most significant sources of aggregate, protecting a large share of the region's production capacity.
- **Competitive market effects.** Hunua Quarry's continuation exerts downward pressure on gate prices.
- **Business continuity and operational maturity.** Hunua Quarry has a century of operational history, established relationships with major construction firms, council and infrastructure agencies. These relationships lower friction and thus decrease project risk for consumers of aggregate.
- **Housing and infrastructure delivery.** Each new dwelling in Auckland requires approximately 250 tonnes of aggregate, and the construction of a single kilometre of two-lane motorway requires approximately 14,000 tonnes. The Project will ensure a reliable, proximate source exists to meet a share of this demand without imposing the cost premiums associated with inter-regional and long-haul supply.

Economic Costs of the Project

There are a small number of economic costs associated with the extension of the Hunua Quarry. They include;

- Opportunity costs of the spend required to extend the quarry. Winstone Aggregates have a choice over how they invest their capital. While there may not be other efficient quarry opportunities in the Auckland region, given the potentially 10-year lead time and $300m capital

[2] Treasury Guidance issued in 2024 on discount rates for cost benefit assessments recommends applying 8% for commercial projects and 2% for non-commercial long term public projects. Due to the distribution of benefits being mostly social, yet this being a commercial project, 5% has been used as a mid-point. Sensitivity analysis is presented in the annex.

investment to develop a new quarry, they always have the option to return funds to shareholders, who may choose to spend that money elsewhere. This cost is acknowledged but not quantified due to uncertainty.

- Impacts on immediate neighbours: immediate neighbours may endure adverse impacts in terms of visual amenity reductions, noise, dust and vibration. However, the effects are limited due to the nature of the surrounding terrain, the limited number of immediate neighbours and the mitigation measures proposed by Winstone Aggregates to address these issues. In its consideration of amenity effects of the Project, given the adverse impacts on neighbours are captured in other specialist impact reports (Air Quality, Noise, Landscape and Visual), they are not replicated in an economic sense here. To do so could lead to double counting of effects.
- Economic costs associated with reductions in indigenous biodiversity: the quarry will push into forest that has been assessed by other specialists as high quality. Winstone Aggregates have a mitigation programme that aims to avoid or remedy any adverse impacts, which, in turn, will limit the economic costs associated with any reductions. However, and for the same reasons above, these costs are not replicated in an economic sense here – as to do so could again lead to double counting.

In total, these economic costs are assessed as small and do not detract from the significant economic benefits the quarry expansion is expected to deliver.

Summary of Economic Benefits

The Project is supported by a compelling economic case under the Fast-Track Approvals Act 2024. **The Project will deliver significant and sustained benefits to the Auckland region**, both throughout the preparation period and after 2044 (the year that the maximum duration of existing regional permits needed for quarrying (extraction and processing) expire and will need to be renewed) on to 2069 at least. In total, there is likely up to 80 years of resource at current extraction rates. The Project's primary function is not to create new productive capacity, it is to prevent the loss of existing supply and the associated market consequences, while increasing production modestly in the long run. The uplift in production will help address the existing and ever-expanding shortfall of aggregate in the Auckland market.

By granting consent under the FTAA, Auckland avoids the need to establish replacement production capacity, conservatively estimated at 10 years of establishment time and $300m of capital investment.

The quantified benefits are conservative. The demand figures modelled are below the proposed peak production capacity of 5.4 million tonnes per annum. (However, this depends upon market demand, and can ramp up rapidly). Therefore, the benefits that accrue in the period to 2106 will be higher than the following conservative estimates:[3]

- $467m - $600m in discounted transport costs;
- $20m - $25m in social costs from additional crash risk; and,

[3] Front loading impacts – i.e., by modelling 5.4m tonnes in the medium term – exposes benefits to smaller compounding denominators, increasing them.

- $206m - $264m in environmental costs from increased heavy vehicle emissions.

These figures represent the avoided costs compared with the counterfactual of aggregate being sourced from the Smythes quarry in Waikato. The equivalent costs for the Maungaturoto (Northland) counterfactual are significantly higher. The figures have been based on average diesel fuel prices over the past few years. Recent events have seen diesel fuel increase significantly in price – placing even greater importance on sourcing rock in close proximity to its final use to minimise cost.

Finally, the consent enables over [redacted] worth of aggregate to be brought to the Auckland market at significantly lower costs than sourcing it from anywhere else. Assessed against the FTAA economic benefits framework, the Project demonstrates it has significant regional benefits and does so across multiple dimensions. The avoided cost analysis alone estimates regional economic benefits of at least $693 million under the most conservative counterfactual. In addition, the expenditure on the project is estimated to add approximately [redacted] in direct value added, and [redacted] in total value added (direct, indirect and induced). The qualitative effects are unambiguously positive, meaning the economic case for the Project is strong.

My assessment supports the conclusion that the Project will generate very significant regional economic benefits.

1 Introduction

Aggregate is a strategic enabling input to New Zealand's housing delivery, transport networks, infrastructure and broader civil construction programmes. Each region, including Auckland, is highly reliant on the availability and price of aggregate in its locality. As a low-value, high-volume commodity, the delivered cost of aggregate is highly sensitive to transport distance and the ability of local supply to respond to demand. The aggregate market is highly constrained, involving significant establishment costs, site limitations, potential site depletion and disruptions. This can translate into higher delivered costs and hamper development.

Winstone Aggregates ("Winstone"), a division of Fletcher Concrete and Infrastructure Limited, has engaged Market Economics to assess the potential economic effects of the proposed expansion of Hunua Quarry at 489 Hunua Road, Hunua, Auckland.

1.1 The Proposal

Winstone is seeking approval to the Project under the Fast-Track Approvals Act 2024 (FTAA). The Hunua Quarry Development is a Listed Project in Schedule 2 of the FTAA, reflecting its regional and national significance. The proposal is to expand the existing quarry to increase annual quarry production to a peak of approximately 5.4 million tonnes of aggregate, and to enable the continued extraction of aggregate for a further 80 years ("the Project") or also referred to as the "quarry development area". Through this approval process, Winstone propose to update the consent conditions and quarry management plans applying to the site to incorporate the changes and enable greater operational efficiency.

The Hunua Quarry is in South Auckland, approximately 5 kilometres (km) southeast of Papakura and 35 km southeast of the Auckland Central Business District ("CBD"). The Hunua Quarry has been operating on the site since the 1920's and produces greywacke rock and supplies a significant part of the Auckland region's aggregate requirements, primarily for use in civil infrastructure such as roading and concrete. The Quarry is recognised as one of Auckland's three most strategically important sources of aggregate.

Additional key aspects of the proposed quarry development include:

- Diversion and reclamation of approximately 941m length of a tributary to Mangapū Stream to enable the expansion of the extraction footprint. This includes construction of a temporary 7m wide bridge to enable access for construction of the stream realignment channel.
- Draining and modification of up to 21 identified natural inland wetlands.
- Providing additional overburden capacity within the Site (from Stage 7), primarily by backfilling the Symonds Hill Pit.
- Construction of new sediment retention ponds, haul road, drainage networks, and Mangapū Stream Tributary diversion integrated with the existing quarry systems.
- Increasing average daily traffic movements during both the AM and PM peak hours when the quarry is operating at peak capacity.
- Removal of 44.5ha of indigenous vegetation, associated with the stripping of overburden including within an SEA and ONL.

- Constructing the western haul road, including two culverts, to provide a more efficient connection between the pit and the processing yard as part Stage 2. The haul road will then be removed during Stage 7 and a new haul road constructed.
- Amending the consented groundwater takes and discharges to Mangapū Stream.
- Providing for some in-pit crushing to enable a greater volume, and more efficient, processing of aggregate.
- Providing for the placement of a greater volume of overburden within the Site.

Winstone is seeking resource consent under the FTAA for both district and regional activities to enable the development of the Symonds Hill Pit. The land use consents (earthworks, vegetation clearance and the disposal of overburden) are being sought in perpetuity (unlimited duration), and a 35-year duration on all water take and use and all discharge permits. Winstone are also seeking a Wildlife Act Authority, an Archaeological Authority and a Complex Freshwater Fisheries Activity Authority.

1.2 Purpose and scope of this assessment

This report has been prepared to support the substantive FTAA application by providing robust economic evidence on the Project's benefits, costs and economic rationale. In particular, it tests the proposition that consenting the Hunua Quarry expansion delivers significant regional (and potentially national) economic benefits by:

- reducing (or avoiding) the need to source equivalent aggregate volumes from more distant quarries, thereby avoiding transport-related costs and externalities;
- improving the resilience and continuity of supply to Auckland's construction pipeline by extending the life of a major strategic quarry;
- sustaining employment and output from a well-established operation while enabling it to respond to growing regional demand; and
- mitigating the risk of supply constraints translating into higher delivered aggregate costs and associated downstream impacts on infrastructure and housing delivery and cost.

Consistent with best practice for quarry assessments in supply-constrained markets, the assessment focuses on the role of aggregate as an enabling input and the avoided costs that arise when local production displaces longer-haul alternatives. The report also considers the economic impacts of Hunua Quarry as a business through capital investment, operational expenditure and other project spending such as ecological mitigation. This analysis forms the basis for assessing the significance of economic benefits under the FTAA.

1.3 Approach

The assessment considers the impacts of the Project on Auckland's aggregate market and the wider economy. It does this through four broad stages:

- **Step 1:** Statutory context, market context and regional economy overview. The analysis situates Hunua Quarry within Auckland's aggregate market, including the region's growth outlook and infrastructure pipeline as drivers of aggregate demand. It examines whether the market exhibits structural shortfall risk and how best to design a suitable counterfactual to the Project proceeding.
- **Step 2:** Gross quantitative economic effects of spending by the business, resultant employment and regional impact of this outlay through an Input-Output (IO) model.
- **Step 3:** Economic effects of the quarry's operations relative to the counterfactual. The report examines marginal economic effects, focussing on avoided transport costs and wider externalities associated with longer haulage.
- **Step 4**: Qualitative and other positive economic effects such as supply chain resilience value (reduced risk of disruption and price escalation), opportunity costs where the expansion affects land outside the enabling zones; and an estimate of the market value of the aggregate resource at current market prices.

1.4 Data sources

The analysis draws primarily on the following sources.

- Project description and operational parameters for the Project and existing operations (including production capacity, staging, enabling works and operational configuration);
- Relevant Auckland and Upper North Island context data (population, economic activity, construction/infrastructure indicators, and aggregate production/supply sources);
- Supply-use tables describing the inter-industry structure of New Zealand's economy; and
- Ministry of Transport Te Manatū Waka data on the social cost of road crashes and NZ Transport Agency Waka Kotahi's VEPM model for emissions costs.

1.5 Caveats and limitations

This report is intended to be conservative and transparent. However, a number of key limitations still arise, including:

- Aggregate production data is incomplete: reporting on aggregate production is voluntary, both through New Zealand Petroleum & Minerals (NZP&M) and Inside Resources. Where possible, data gaps are addressed, but imputation methods are blunt and imperfect.
- There is no definitive source of aggregate consumption data for New Zealand. The per-capita demand figure used in this assessment (9.1 tonnes per capita for the North Island) is derived from a methodology that integrates NZP&M data with Inside Resources quarry-level data, accounting for the structural flaws with imputation techniques. While a reasonable approach, it is still an estimate of constrained demand. Unconstrained demand is likely to be higher.
- Future demand trajectories are uncertain. Aggregate demand is a function of numerous factors such as population growth, infrastructure timing and economic cyclicality. Two projects, Drury Sutton Block Expansion and Kings Quarry Stage 2 were approved under the FTAA in December 2025. Consents for other Auckland quarry projects are pending, meaning their contribution to

future supply is not yet reflected in production data. The rationale for Hunua Quarry takes this into account, but we cannot eliminate other future uncertainty.

- The counterfactual is simplified. The analysis models supply displacement without the Project to two alternatives, Maungaturoto (Northland) and Smythes (Waikato) – see location in Figure 4 below. In practice, the mechanism by which the market would respond is through the supply network. A cascading redistribution would likely occur across multiple sources, rather than redistribution to a single alternative. Both modelled alternatives already send some of their product to the Auckland market and may lack the spare capacity to fully absorb Hunua's volumes. The modelled avoided costs are therefore a floor. Actual displacement costs would likely be higher if more distant or less established sources were required.
- Input-Output analysis measures gross activity not net welfare. The IO framework used to show the economic impacts of capital and operational expenditure is a well-established tool but is subject to a number of limitations. These have been explicitly acknowledged in recent FTAA panel decisions including Waihi North[4], and are therefore addressed directly in Section 5. The primary avoided costs analysis does not rely on this, and IO results are not included in NPV summaries.
- The analysis does not model the degree to which higher delivered aggregate costs under the counterfactual would be passed through to end users. This depends on competitive conditions, contract structures and the bargaining positions consumers and suppliers.
- This report does not independently verify operational parameters supplied by Winstone, including production capacity, staging assumptions and expenditure estimates. These are taken as given.

Where parameters are uncertain, the report identifies these and tests sensitivity where practicable. We distinguish clearly between quantified effects supported by evidence and qualitative effects that are directionally clear but not able to be calculated or monetised. Throughout the report, the rationale for the Project forms a key part of the overall analysis.

1.6 Code of Conduct

The author of this report is **Greg Akehurst (BA Geography/BCom. Economics)**, Director Market Economics, RMLA, NZ Association of Economists. Greg has 30 years' experience in economic consulting, including 25 years as a Director of Market Economics Ltd. During this time, he has carried out numerous assessments of economic benefits and effects of developments and projects under the RMA, the COVID-19 Fast Track Act and the Fast Track Approvals Act 2024. With respect to aggregate, Greg has carried out economic studies including Kings Quarry Stage 2, Drury Quarry, Waihi North Mine, Waingaro Quarry and Belmont Quarry in Wellington. Greg has also acted as a peer reviewer for Councils and others on economic matters.

Analytical support and quality assurance has been provided by **Tom Harris (BSc/MSc Economics)**, Senior Consultant at Market Economics. Tom has three years' experience at Market Economics, during which time he has carried out a number of economic assessments in support of FTAA applications. Prior to joining M.E, Tom worked in the UK Civil Service as an economist across a challenging portfolio of projects and sectors. During the Covid-19 pandemic he was the principal analyst in the Department for Education

[4] FTAA-2504-1046 Waihi North Decision – decision regarding input-output analysis overstating the extent of additional employment

modelling the pandemic's impacts on Children's Social Care. His other roles included leading on graduate outcomes analysis, supporting high-profile national policy implementation, being embedded in the permanent secretary's office, and working closely with external academics and stakeholders. Tom has taught undergraduate economics at the University of Exeter and runs Good with Data, a New Zealand-based charity doing pro bono data-led project for charities.

Full C.V's for Greg and Tom are contained in Section 9, below.

While this assessment and application is not before the Environment Court, this report has been prepared and reviewed in accordance with the Environment Court's Code of Conduct for Expert Witnesses, contained in the Environment Court Practice Note 2023. Other than where it is stated that reliance is placed on the advice of another person, the author(s) confirm that the issues addressed in this report are within their area of expertise. The author(s) have not omitted consideration of any material facts known to them that might alter or detract from the opinions expressed.

2 Statutory context

2.1 The Fast-track Approvals Act 2024

The Project is listed under Schedule 2 of the FTAA. The substantive application seeks approvals for resource consents, Wildlife Act permits, archaeological authorities, amendments to conservation covenants, and complex freshwater fisheries activities. In all cases, when considering the above applications, the Panel must take into account the purpose of the FTAA. When doing so, the Panel must consider the extent of the Project's regional or national benefits.

In addition, and when considering the application, the Panel may decline an application only where adverse impacts of the Project are sufficiently significant to be out of proportion to its regional or national benefits, after accounting for any conditions or modifications of the proposal.

2.1.1 Significance of Economic Benefits

As a listed project pursuant to Schedule 2 of the FTAA, Parliament has determined that the Hunua Quarry Development has significant regional benefits. Although not strictly relevant to the assessment of this project, s 22 of the FTAA provides criteria against which a referral application can be assessed to have "significant regional or national benefits", including "significant economic benefits". As noted above, it is the extent of those benefits that are directly relevant to the assessment of a substantive application.

The FTAA does not prescribe quantitative thresholds for "significant economic benefits". Significance is inherently contextual. The Waihi North panel confirmed that significance is an indication of scale and is not determined solely by whether regional or national GDP will change appreciably[5]. In the context of quarrying the Panel in the Drury Quarry Sutton Block Expansion decision[6] recently found that project clearly had significant regional, and likely national benefits including:

- Delivery of significant aggregate to provide critical support to the development (in particular) of housing and infrastructure;
- Assisting to meet anticipated growing demand for aggregate; a critical resource for infrastructure and development;
- Saving on transport costs (with flow-on implications for affordability of aggregate) and reducing transport-related effects on the environment;
- Enabling and facilitating Auckland's economic growth and providing certainty of future supply of aggregate; and
- Providing efficient resource use through utilisation of the existing Drury Quarry infrastructure.

[5] Record of Decisions of the Expert Panel for Waihi North (18/12/2025)

[6] FTAA-2503-1037 Drury Sutton Block Decision 130.1 – 130.5

As noted below, the present Project shares many similarities with the Sutton Block Quarry project in that regard.[7]

2.1.2 Infrastructure Significance

Hunua Quarry is a critical enabling input for Auckland's housing, roading, and utilities construction pipeline. Most recently, products from Hunua Quarry have contributed to the construction of the Western Ring Route, Taxiway Mike at Auckland International Airport, the Waterview Tunnel and the City Rail Link.

The economic case for the Project is based on the avoidance of a quantifiable cost burden on the Auckland economy, rather than a large shift in regional or national GDP, because the Project effectively provides longevity of extraction, with the provision of additional rock, over and above current production levels generating smaller, but important additional benefits (and reducing Auckland's growing supply gap see Section 4.5, below).

2.1.3 Emissions

Hunua's locational advantage reduces the haulage distance for a significant share of Auckland's aggregate demand relative to out-of-region alternatives. This translates directly into avoided transport emissions. These are quantified in Section 5.

2.2 Other policy alignment

2.2.1 Housing growth and affordability

The Government's Going for Growth agenda (2025) sets out its approach to accelerating New Zealand's economic performance[8]. Within that context, it asserts that delivering infrastructure has become overly complex and inefficient, limiting productivity growth and improvements in living standards.[9] The construction sector, which is central to both housing and infrastructure delivery, continues to face structural challenges such as productivity, resilience and cost pressures.[10]

These national priorities are also evident at a regional level. Auckland Council's infrastructure strategy commits approximately $295 billion (2024 prices) in infrastructure expenditure over the next 30 years[11]. Meanwhile, the Housing and Business Capacity Assessment (HBA) identifies a requirement for 197,100 additional dwellings over the same period under a medium growth scenario[12]. South and East Auckland are

[7] We note, for completeness, that Market Economics was responsible for preparing the economic impact assessment which supported the substantive application for the Drury Quarry Sutton Block Expansion project. Market Economics' analysis as to the extent of regional economic benefits was accepted by the Panel appointed to consider that application.

[8] Going for Growth – MBIE (2025)

[9] Infrastructure for Growth – MBIE (2025)

[10] Building and Construction Sector Trends: Annual Report 2023 – MBIE (2024)

[11] Auckland Council's 30-year Infrastructure Strategy – Auckland Council (2024)

[12] Housing and Business Development Capacity Assessment for the Auckland Region – Auckland Council via Knowledge Auckland. (Overall housing demand vs supply assessment summary table)

expected to account for 41% of growth between 2023 and 2053, meaning a high proportion of demand is concentrated near to Hunua[13].

Aggregate is a key input into this challenging landscape. The configuration of the aggregate supply system directly influences project feasibility, construction timelines and the cost base for the entire construction sector. The Project therefore aligns with the Going for Growth agenda. It protects local aggregate supply at a scale and proximity required by Auckland's construction economy, reducing the cost burden compared with alternative, more distant sources, thereby supporting the timely delivery of housing and infrastructure.

2.2.2 MBIE Minerals Strategy

In January 2025, MBIE released A Minerals Strategy for New Zealand to 2040[14]. It emphasises the importance of industrial rock and aggregates as foundational inputs for enabling innovation, manufacturing and economic growth. The Project directly serves the objectives of this strategy, addressing supply risks and ensuring continued access to a large-scale resource for Auckland.

2.2.3 Auckland Unitary Plan

The Auckland Unitary Plan (AUP) designates a Special Purpose – Quarry Zone (SPQZ) for significant mineral extraction sites[15]. The zone provides for significant mineral extraction activities to ensure that quarrying and other activities can continue in a manner that minimises adverse effects, and helps to meet demand for aggregate locally where possible. Hunua Quarry is within the SPQZ. The Quarry is therefore entirely consistent with the purpose the AUP assigns to the SPQZ.

The expanded extraction footprint will, however, extend beyond the SPQZ into the Rural – Mixed Rural Zone. The quarry development area is also subject to several AUP overlays: the Quarry Buffer Area (Chapter D27), an Outstanding Natural Landscape overlay (ONL, Area 60 Ponga Road), Significant Ecological Areas (SEA_T_5323 and SEA_T_7032), a High Use Stream Management Area (HUSMA) and a Natural Stream Management Area (NSMA). The site is further subject to Council's Proposed Plan Change 120 – Housing Intensification and Resilience (PC 120), which includes provisions to better manage development for natural hazards. In the case of Hunua Quarry, the site and wider area is identified as a flood plain.

These overlays and plan change provisions signal that the AUP recognises environmental, ecological and amenity values (as well as constraints) on the affected land. The environmental and planning implications of this are addressed by other technical experts in this application. From an economic perspective, the relevant consideration is the opportunity cost of the land and resources affected relative to the economic benefits of extraction. In this context, the economic value of securing 80 years of proximate aggregate supply for Auckland substantially exceeds the foregone economic value of this land. This point is tested quantitatively and qualitatively in the subsequent sections.

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[13] Stats NZ Subnational population projections (25/09/2025) and groupings based on Auckland Council Spatial Definitions

[14] A Minerals Strategy for New Zealand to 2040 – MBIE (2025)

[1515] Special Purpose – Quarry Zone; AUP

3 Market Context

3.1 Economic fundamentals of the aggregate market

Aggregate is a foundational input to nearly all forms of construction activity. Roads, utilities, housing and commercial/industrial development all require large quantities of aggregate, delivered at scale, on time and to specification. Its availability and delivered cost directly influence project feasibility, construction timelines and the broader competitiveness of regional economies.

Three characteristics define the economics of aggregate supply:

1. **Non-substitutability.** Aggregate performs specific functions that cannot be replicated by alternative materials. Specifications are typically determined by engineering standards rather than market preferences.
2. **Low value-to-weight ratio.** Aggregate is a bulk commodity. Because it is required in large volumes, delivered prices are determined by distance, travel time, the availability of proximate sources (competition) and rock types. There is an acute sensitivity to transport costs.
3. **Supply inelasticity.** Aggregate production requires substantial up-front capital investment (e.g., extraction equipment, processing plants, resource consents and land acquisition), long-term resource security and operational infrastructure. New commercial quarries can take around 10 years to operationalise and around $300m[16]. Equally, established quarries cannot usually scale output quickly. When demand surges, supply cannot respond immediately. The result is price escalation, project delays or, in some markets, rationing of available aggregate to priority clients. An example commonly cited in New Zealand is the construction of the Transmission Gully in Wellington, where some of the aggregate needed to be sourced from Waikato due to local scarcity.

3.1.1 The importance of distance

For construction viability, the key metric is delivered costs. This is the sum of the gate price, transport cost and, where applicable, other costs such as waiting time, inventory holding costs or risk contingencies. Direct haulage costs usually range from $0.38 - $0.55 per kilometre tonne, depending on the distance travelled. Beyond these costs, longer travel distances:

- increase truck cycle times, reducing daily deliveries and constraining the ability to meet just-in-time construction schedules;
- require larger vehicle fleets to maintain equivalent delivery rates, increasing capital and operational expenditure across the supply chain;
- increase exposure to disruption risk from traffic incidents, road maintenance or weather events; and
- generate externalities (emissions, road wear, crash risk, noise).

[16] Discussions with major quarry operators in New Zealand (personal communication).

3.2 Auckland's aggregate market structure

Auckland's aggregate market exhibits several defining characteristics. A small number of producers account for the bulk of supply in Auckland; entry barriers are high; and demand often exceeds available capacity. The market is shaped by:

- The geographic location of rock. Not all locations possess deposits of suitable material that can be extracted economically.
- Zoning and consenting constraints. The Auckland Unitary Plan contains the SPQZ, which I understand is intended to be broadly enabling of quarrying. However, even within those identified zones, consenting processes can be lengthy and uncertain. Part of this Project extends beyond the SPQZ, meaning additional considerations are required for land use and foregone value.
- Auckland's urban development. A growing population increases demand for aggregate. It also causes the urban footprint to expand such that existing quarries are now closer to residential development. Residents tend to oppose proximate quarries because of noise, dust and vehicle movements, which can complicate consent renewals and expansions.
- Finite resources. Over time, extractable resources are exhausted. Without new sources or expansions to existing sites, the production capacity falls.

The resulting Auckland market is characterised by demand exceeding supply, requiring aggregate to be imported from out-of-region. The shortfall is met through quarries in Northland and Waikato. These imports impose higher delivered costs and distance-related externalities.

In a 2020 online survey by New Zealand Transport Agency Waka Kotahi, of 13 industry participants from Auckland, nearly all agreed that aggregate supply issues existed. Results were not disaggregated by region, but overall sentiment reflected difficulties in sourcing the right type of aggregate near demand centres, a challenging consenting process, limited forward planning and competition for available material. These messages have been echoed by many known operators in the Auckland region, too.

3.3 Hunua Quarry's role in the Auckland market

Hunua Quarry is a strategic source for Auckland due to its scale, established processing capacity and proximity to major demand nodes in South and Central Auckland. It supplies a broad suite of graded products used across concrete, asphalt and roading applications. Located approximately 5 km east of Papakura and 35 km southeast of Auckland's CBD, it can supply large volumes within short haul distances.

Rock has been extracted from Hunua for almost 100 years. Hunua Quarry is recognised as one of Auckland's three most strategically important aggregate sources[17]. In addition to the established aggregate supply operation, it has comprehensive environmental management systems; established relationships and contracts with major construction firms, council and infrastructure agencies; and operates a managed fill,

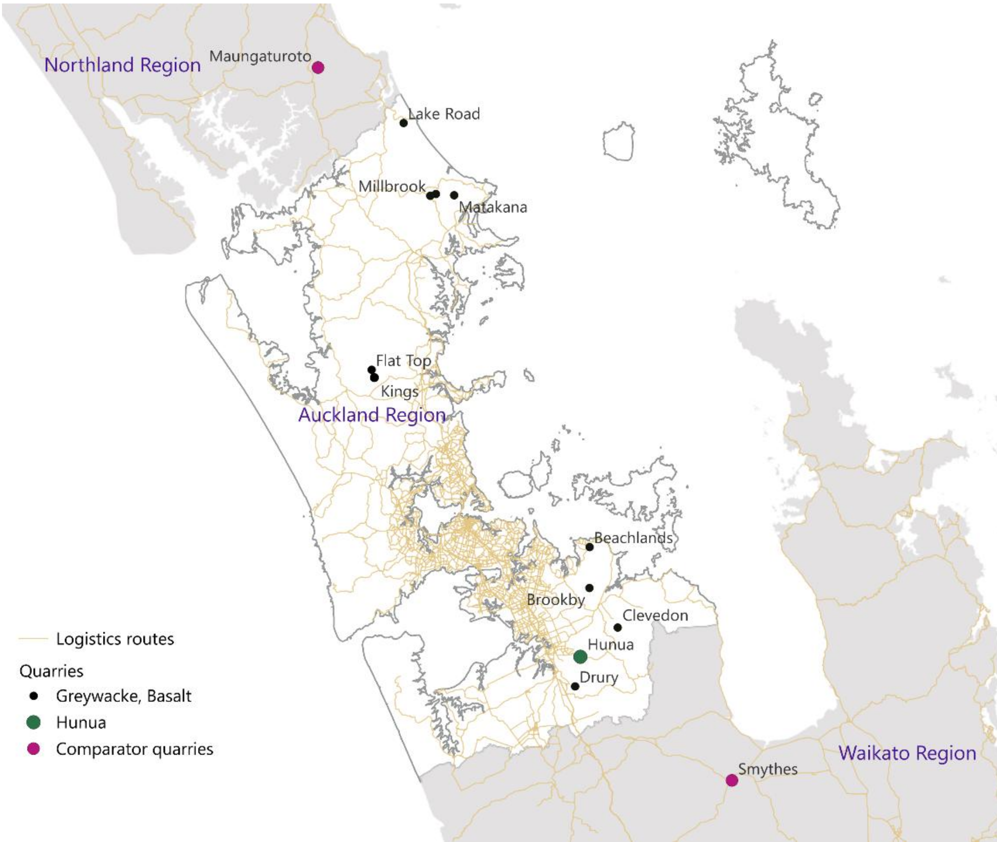
[17] The others being Stevenson's Drury Quarry and Brookby Quarry – all located within the Hunua Ranges.

which supports Auckland's waste disposal system. This operational maturity reduces supply risk and demonstrates its ability to deliver consistent volumes over extended periods with high levels of environmental compliance.

Figure 4 shows Hunua and the other main quarries in Auckland region. Maungaturoto and Smythes are also shown due to their role servicing Auckland's supply shortfall and inclusion in the subsequent counterfactual modelling. Hunua Quarry's location gives it excellent access to South Auckland, which is projected to accommodate a substantial share of Auckland's population growth over the next 30 years. This growth will generate sustained demand for residential construction, local infrastructure (roads, utilities, community facilities) and commercial development. Hunua Quarry's location minimises transport costs for these projects.

Hunua Quarry is also connected to Auckland's motorway network easily via SH1 and other key freight routes. These enable efficient transport to Central and Eastern Auckland demand nodes, as well as proximate South Auckland areas. Hunua's locational advantage translates directly into lower delivered costs for a substantial portion of Auckland's construction activity compared with out-of-region alternatives.

Figure 4 - Key Greywacke and Basalt Quarries serving the Auckland Region



3.4 Structural deficits and recent consents

The Project secures continued access to Hunua Quarry's greywacke resource and, critically, enables production to increase to the proposed peak capacity of 5.4m tonnes per year. This is significantly higher than recent average output of 2.72m. Because the market is in structural deficit, the additional capacity helps to service some of the demand. In a scenario without Hunua, the supply gap would widen, requiring additional imports or alternative quarry development(s). A number of recent consents have been granted (Brookby, Sutton Block Expansion, and Kings Quarry Stage 2) under various fast-track regimes, which strengthen Auckland's supply position. However, they still leave a shortfall that grows as Auckland grows, and therefore do not affect the rationale for sustaining Hunua Quarry as a key strategic component of the aggregate supply system.

4 Aggregate Demand and Supply

4.1 Data landscape

No definitive source exists for estimating aggregate production levels in New Zealand. A 2022 report for NZTA recommended developing *"an aggregate data integration framework to standardise, collate and improve aggregate data information at both the national and regional levels where possible"*[18]. Unfortunately, that recommendation has not been implemented. The available data landscape is summarised below.

National and regional production is most consistently tracked through the NZP&M annual aggregate production survey, administered by MBIE. The survey is voluntary. Response rates have fluctuated between 38% and 63% over the past 4 years, compared with an average of 76% between 2012 and 2020. The survey is a useful indicator but cannot be treated as a census-type source of output. Both coverage and the set of non-responders vary between years, meaning that fluctuations might reflect reporting changes rather than production shifts.

In addition to NZP&M, Inside Resources collects data on individual quarries and their annual production. Submissions are voluntary and some data are known to be outdated or not representative. However, it is a helpful quarry-level source and Market Economics have scraped the database annually to cross-validate NZP&M totals.

The magnitude of NZP&M undercounting has been estimated on several occasions. In 2017, Fulton Hogan conducted a comprehensive assessment of aggregate production in Auckland, finding NZP&M reporting for that year to be 28% below true levels. A 2021 report for the New Zealand Infrastructure Commission also estimated the 2017 quantum with data from the Aggregate and Quarry Association (AQA), which suggested that the NZP&M tonnage for New Zealand was 29% below the true figure[19], being remarkably similar to Fulton Hogan's findings.

The coverage issues are significant but are not the most fundamental problem for decision making. The nature of the data as backward looking when the market operates on planning horizons of decades causes a misalignment between the perceived market conditions when a decision is made and those when it becomes reality. Consenting times for quarries in Auckland render historical production figures in isolation effectively obsolete for forecasting. Equally, supply constraints visible in recent production data may be partially addressed by projects not yet reflected in output statistics. If Auckland is planning for growth, it must also plan for quarries as part of planned infrastructure delivery.

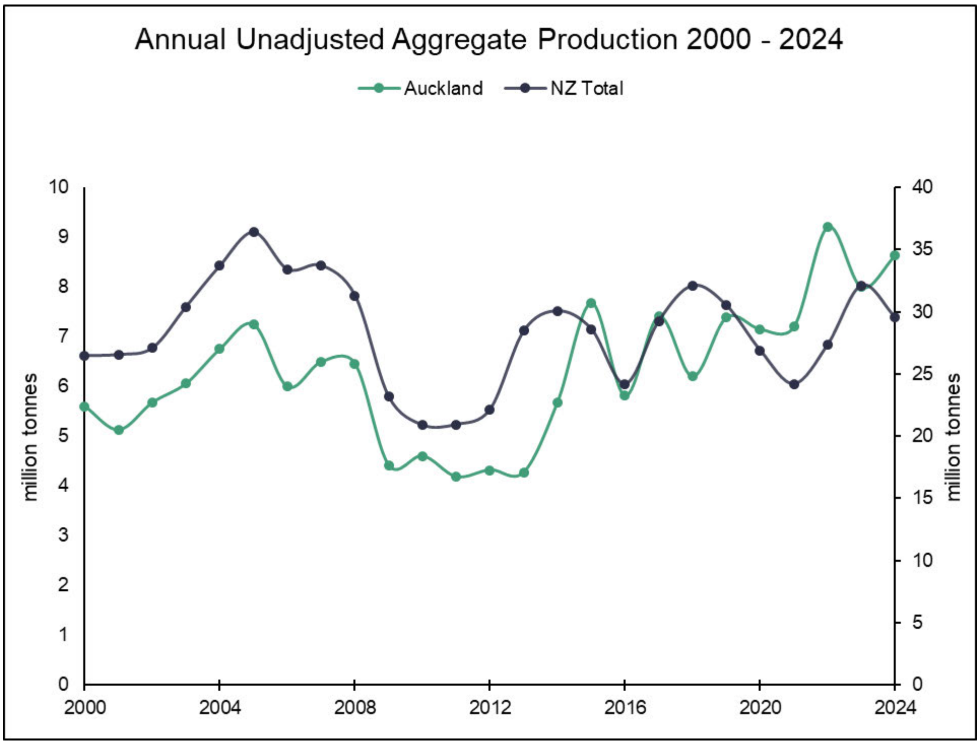
[18] Aggregate supply and demand in New Zealand – Wilson et al. (2022). Report for Waka Kotahi

[19] Aggregate opportunity modelling for New Zealand – Infrastructure Commission. This report also estimated that average production per capita was 8.4 tonnes in 2017.

4.2 Aggregate Supply

Figure 5 shows the aggregate production figures reported by NZP&M for 2000 – 2024. The broad trends appear to show that production increased between 2000 and 2007, declined sharply around the Global Financial Crisis, then recovered through the mid-2010s, driven by the Christchurch earthquake reconstruction and broader macroeconomic conditions. The survey systematically undercounts production – with the degree of undercounting varying between years – which means year-on-year fluctuations cannot be confidently attributed to actual demand shifts versus changes in survey coverage. However, the reported trends do align with known sectoral cycles, providing a broadly credible indicator of overall aggregate market dynamics over the period.

Figure 5 - Aggregate Production in Auckland and New Zealand



Reported production in Auckland was 8.6 million tonnes in 2024. However, this is a known undercount: several major quarries have confirmed output levels which, taken together, exceed what NZP&M records. Table 1 applies the 2017 adjustment factor from the AQA and Fulton Hogan to derive adjusted population estimates for regions within New Zealand. This is presented alongside per capita ratios. Auckland's adjusted per capita production of 6.6 tonnes is considerably lower than both Northland and Waikato (10.9). The true difference might be greater than the data suggests because a sharp decline in Waikato's reported 2024 figure relative to 2023 narrows the gap. In the absence of known closures or production changes, this is indicative of reporting changes rather than a reduction in total output.

Table 1 - Adjusted Aggregate Production Estimates

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Adjusted Aggregate Production										
Auckland	10.7	8.1	10.3	8.7	10.3	10.0	10.1	12.9	11.2	12.1
Waikato	7.5	5.7	7.9	11.5	7.2	8.8	8.6	8.4	10.0	5.8
Northland	2.3	1.0	2.0	1.2	1.1	1.5	1.3	1.1	2.0	2.2
Total New Zealand	39.7	33.4	40.5	44.5	42.2	36.5	31.3	36.7	44.2	41.3
Per Capita										
Auckland	6.9	5.1	6.4	5.2	6.1	5.8	5.9	7.6	6.4	6.6
Waikato	17.0	12.7	17.1	24.2	14.7	17.6	17.0	16.3	19.0	10.9
Northland	13.3	5.7	11.0	6.6	6.0	7.9	6.7	5.7	9.7	10.9
Total New Zealand	8.6	7.1	8.4	9.1	8.5	7.2	6.1	7.2	8.4	7.8

The per capita differences reflect structural imbalances whereby Auckland imports significant quantities of aggregate from adjacent regions (Northland and Waikato). This has the effect of adjusting Auckland per capita demand up towards the island average (9.1 tonnes), and Northland and Waikato's demand down towards the average.

4.3 Aggregate Demand

The overall demand baseline used in this assessment is taken from a methodology first set out in *Futureproofing Access to Aggregate* (Market Economics, 2024), prepared for Kaipara Ltd and the Aggregate and Quarry Association of New Zealand. That work integrated NZP&M data with Inside Resources data at a quarry level. Where data was absent, it was imputed from locational quarry employment levels or output data from representative equivalent quarries. The resulting estimates suggested that aggregate demand was approximately 9.1 tonnes per capita in the North Island and 10.1 tonnes per capita in the South Island. More detail on that estimation approach is contained in the Appendix.

4.4 Demand drivers in Auckland

Auckland's aggregate demand is a function of three primary components.

- **Housing delivery and urban growth**. New dwellings require aggregate directly (concrete, drainage, pavements) and indirectly through enabling works (local roads, stormwater infrastructure and site preparation). To build an average house, approximately 250 tonnes of aggregate is required[20]. High population growth, particularly where it is accommodated through greenfield expansion, therefore lifts aggregate demand, and can even increase demand per capita.
- **Infrastructure investment and renewals.** The construction and maintenance of roads and pavements require large quantities of aggregate. To build a 1km two-lane motorway requires roughly 14,000 tonnes of aggregate. Water, wastewater and stormwater networks also require ongoing capital works and renewals.
- **Commercial and industrial development**. Industrial land supply and commercial projects often require aggregate, in addition to requiring road upgrades.

[20] AQA Factsheet. Accessed 12/02/2026

The Drury-Opāheke structure plan area is very near to Hunua Quarry and is expected to add 25,000 dwellings over the coming years, in addition to retail, businesses, roading infrastructure and a large medical facility[21]. This will stimulate local demand over the period, with the housing programme alone implying demand of 6.25 million tonnes.

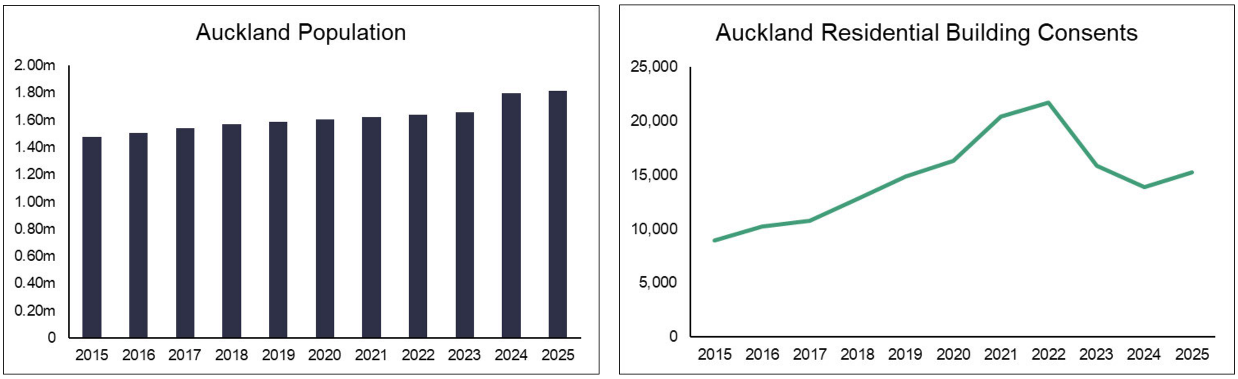
Similarly, the Drury Metropolitan Centre Consolidated Stages 1 and 2 received FTAA approval in November 2025[22]. This will add to the demand for aggregate, which will materialise progressively over the coming years.

4.4.1 Key indicators

Population levels and housing consents offer the two clear metrics for understanding the trajectory of aggregate demand. Population growth is associated with demand for housing, commercial space and associated infrastructure. Meanwhile, housing consents are a forward indicator of construction intensity and potential aggregate requirements.

Figure 6 shows Auckland's population and annual building consents since 2015.[23] Consents peaked at 13.3 per 1,000 residents in 2022 before falling back down to 8.4 in the year to November 2025, which is roughly the same level as 2018-2019. This is attributed in large part to rising construction costs, with other influences being tightening fiscal conditions and cautious business and developer sentiment. Auckland's population has been steadily increasing for the last decade, with a particular increase in the last two years. Stats NZ medium population projections expect this trend to continue at 1.1% per annum for the next 25 years, adding more than half a million people[24]. Between 2026 and 2036, the medium projections forecast an increase of 240,000 people, potentially adding 2.2 million tonnes to regional aggregate demand.

Figure 6 - Population and Building Consents in Auckland 2015 - 2025



[21] Drury: connecting Auckland – Auckland Council (accessed 18/03/2026)

[22] Drury Metropolitan Centre – Consolidated Stages 1 and 2 – Fast-track Projects

[23] Stats NZ Subnational Population Estimates and building consents for each year to November.

[24] Stats NZ Subnational population projections: 2023 (base) – 2053

4.4.2 The infrastructure and investment pipeline

New Zealand faces a significant infrastructure deficit. A 2021 Infrastructure Commission report estimated an existing $125 billion (2026 prices) shortfall, with this on track to increase to $253 bn in 30 years. This message is echoed repeatedly, including in a 2022 NZ Transport Agency Waka Kotahi report which asserted that a medium-term deficit in infrastructure re-investment, combined with strong population growth, has resulted in much of the country's public infrastructure reaching the end of its useful or economic life.

The Government Policy Statement on Land Transport 2024 – 2034 (GPS-LT) proposes a 30% increase in funding (revenue) for the National Land Transport Fund over the three years to 2027, signalling the scale of current underinvestment[25]. Similarly, the Government's Going for Growth agenda signals a drive to increase productivity and resilience. One of the five pillars, "infrastructure for growth" explicitly acknowledges and targets the role of infrastructure, but also the constraints to deliver, of which the supply of aggregate can be a critical factor.

4.5 Supply vs Demand

Applying the North Island figure for tonnes of aggregate demand per capita (9.1 tonnes/cap) to Auckland's current population implies a total demand of approximately 16.7 million tonnes annually. Even accounting for pending and approved consent applications, Auckland's future production of aggregate looks unlikely to reach that level in the near future.

Table 2 and Table 3 show an indicative outlook comparing supply with demand in Auckland. On the supply side, Auckland's adjusted production in 2024 is combined with the recently consented net additional supply estimates from Brookby (2.55m tonnes), Drury Sutton Block (1.3m tonnes) and Kings Quarry Stage 2 (0.5m tonnes)[26]. On the demand side, Auckland's 2026 population (1.83m) is increased by the Stats NZ population projections. Table 2 uses the medium forecasts and Table 3 uses the high scenario. The outcome is a widening of the shortfall from around 2m tonnes in 2026 to 6m or 9m depending on the scenario selected.

Table 2 - Supply vs Demand (Medium Population Growth)

Medium Growth	2026	2030	2035	2040	2045	2050	2055
Aggregate Demand	16.7	17.6	18.6	19.7	20.7	21.7	22.6
Auckland Agg. Supply	14.6	16.4	16.4	16.4	16.4	16.4	16.4
Shortfall	**-2.1**	**-1.2**	**-2.2**	**-3.3**	**-4.3**	**-5.3**	**-6.2**

[25] Government Policy Statement on land transport – Ministry of Transport Te Manatū Waka

[26] Brookby is assumed to come online soon with Kings and Drury at some point before 2030.

Table 3 - Supply vs Demand (High Population Growth)

High Growth	2026	2030	2035	2040	2045	2050	2055
Aggregate Demand	16.9	18.1	19.6	21.1	22.5	23.9	25.4
Auckland Agg. Supply	14.6	16.4	16.4	16.4	16.4	16.4	16.4
Shortfall	**-2.3**	**-1.7**	**-3.2**	**-4.6**	**-6.1**	**-7.5**	**-9.0**

Without the Project, this gap will be significantly wider, with the difference being met through imports from neighbouring regions, principally Waikato.

A crucial caveat is that this figure is derived from observed consumption – i.e., what New Zealand uses under current supply conditions, including the raised prices caused by import dependence. It is not a measure of unconstrained demand. Therefore, if local supply increased, consumption could be higher. This suggests that the supply shortfall might be at the lower end of the realistic supply gap.

4.6 Sufficiency and links to growth

There is insufficient aggregate produced in Auckland to service demand. According to the New Zealand Infrastructure Commission, Te Waihanga (2021), no new quarries had been established in Auckland between 2014 and 2021, and only three existing sites had been expanded[27]. This has further intensified the regional shortage. The report estimated Auckland's aggregate deficit at around 4.5 million tonnes per annum[28], requiring higher-cost imports to meet demand. The Infrastructure Commission estimates Auckland produced around 10.5 million tonnes[29] of aggregate in 2019. This is similar to adjusted supply levels derived from our modelling, averaging 10 million tonnes over the past decade.

Without a buffer of consented capacity, the market remains permanently vulnerable to supply chain shocks and price spikes. In a market characterised by high entry barriers and supply inelasticity, "too much" aggregate is an objective economic good. It forces producers to compete on gate price and service levels. At the other end of the spectrum, shortages allow incumbent producers to charge excessive prices because customers have no superior alternatives.

The growing population, coupled with structural challenges for the construction sector reinforce the importance of aggregate production capacity. Aggregate supply is one of the few cost components where regional and district plan provisions can materially influence delivered prices through capacity planning and consenting decisions. Maintaining local aggregate supply levels does not eliminate construction cost inflation, but it prevents aggregate scarcity from being a critical constraint for project viability.

[27] https://tewaihanga.govt.nz/our-work/research-insights/infrastructure-resources-study

[28] This is higher than the M.E estimates that are described later in the report and does not include increased production from the recently consented Brookby Stage 3 and other pipeline consents.

[29] Similar adjustments are made to AQA survey data.

The Project will help establish a competitive, resilient market for construction inputs in Auckland over the next 80 years. This will have the effect of putting downward pressure on prices, directly supporting housing delivery and affordability, and the broader commercial viability of Auckland's development pipeline.

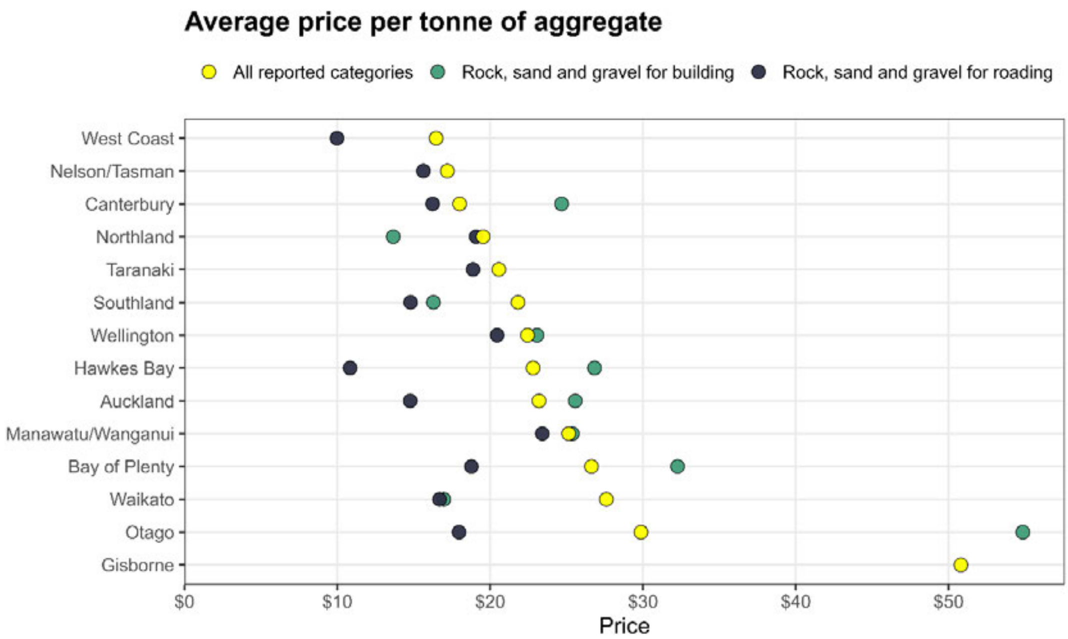
4.7 Market Signals

Some of the clearest evidence of market need comes from the revealed preference of quarry operators who bear the financial consequences of being wrong. There are four Auckland quarries listed under the FTAA (Hunua, Flat Top, Kings, Drury), as well as multiple non-Fast Track applications. Operators only invest years and significant capital in feasibility assessments and the consenting process when they are confident that demand will sustain the extraction over multiple decades. This is evidence of a strong structural deficit and latent demand for the product they want to sell.

Auckland's import reliance is another signal of structural constraints and inefficient market outcomes. It imports significant volumes from both Waikato and Northland, which involves considerably higher delivered costs compared with local alternatives. Beyond the immediate cost premium, longer haul distances increase truck cycle times, constrain the ability to meet just-in-time construction schedules, expose supply chains to greater disruption risk and generate additional externalities in the form of emissions, road wear and crash risk.

In addition to output, NZP&M also publishes the average gate price of purchased aggregate by region. Regional discrepancies offer some insights into potential market dynamics. Figure 7 plots the data for each region, with additional breakdowns for specific categories where these are available. The average prices of the sample that reported should be a good proxy for the true average in the region. Auckland's average gate prices are above the national median. This might reflect higher production costs, constrained supply or intense competition from consumers. This moderate premium is consistent with the narrative that the market is under pressure. The price differentials between products highlight the importance of supply diversity. The regional price differentials further evidence the market segmentation: that supply does not flow freely to eliminate price gaps.

Figure 7 - Average Tonnage Prices (NZP&M, 2024)



4.8 Concluding remarks

The analysis above demonstrates the need for increased capacity. Production data confirms Auckland's reliance on imports to overcome local supply shortages; the consent pipeline and business sentiment signals a broad consensus that the gap is expected to persist and potentially deepen; and the gate price data reinforces the supply tightness. **Collectively, these data suggest that local capacity is insufficient, and the costs are already being borne by the construction sector**. Enabling local capacity continuation will reduce potential cost increases and reduce exposure to supply disruptions.

5 Economic Effects of the Project

5.1 Overview and Analytical Approach

The Project secures the long-term viability of an established quarry operation in a market where demand exceeds local supply. We consider the economic effects of the Project through three overarching channels. These broadly align with the stages 2, 3 and 4 of the analysis as described in Section 1.3, building on the context established in previous sections.

1. The gross economic effects of Hunua's operations and the capital expenditure, which is estimated through an Input-Output (IO) framework (Section 5.3).
2. The economic effects of the quarry's operations relative to alternative, out-of-region supply alternatives, modelled using Maungaturoto in Northland and Smythes in Waikato. These avoided costs represent marginal benefits to the Auckland economy (Section 5.4).
3. Other economic effects such as the value of the resource, efficiency gains from the haul road, continuity value, supply chain resilience value and opportunity costs (Section 5.5 – 5.7).

We analyse each of these channels in turn. Where effects are quantifiable with defensible assumptions, they are presented in monetary terms. Where this is not possible, we discuss them qualitatively with reference to the evidence base, describing the scale and direction of impact.

5.2 The Project and counterfactuals

The Hunua Quarry already operates, already employs staff, and already supplies aggregate to existing customers under existing contracts and long-term supply relationships. The Project extends the quarry's productive life by up to 80 years and provides for annual production of up to 5.4 million tonnes. Hunua is one of the three largest suppliers in Auckland, meaning that if it were to cease production, it would not redirect demand to capacity elsewhere in the market. In the absence of the Project, the existing shortfall would be enlarged.

Table 4 summarises the Quarry's existing and potential future production levels. Recent production levels have averaged 2.72 million tonnes per year, exceeding 3 million tonnes in 2025 and 2024. Winstone estimates that the Quarry will be able to achieve up to 5.4 million tonnes annually (at peak production), depending on a range of commercial and market factors. At the lower end, this increase is broadly within the historic annual volatility ranges. The high scenario represents a modest step increase on historic levels.

It will take time to increase annual production to these levels, hence associated assumptions about when this production level could be achieved. It is estimated that there is in excess of [redacted] of resource at the site, therefore production levels will be adversely affected when the resource expires. For the purpose of this assessment, effects are appraised over the full 80-year operational life of the site to align with the numbers in the application, noting that stronger demand for aggregate would see the resource quarried at a greater rate.

All values in the assessment are presented in real 2026 prices, discounted at 5% to yield present values (PV). The analytical outputs discounted at 8% and 2% are all contained in Appendix 8.3. The New Zealand Treasury guidance recommends 8% for commercial proposals and 2% for non-commercial proposals. 8% therefore reflects the opportunity cost of capital in the commercial sector. However, many of the benefits from the project are inherently social in nature (avoided transport costs, reduced crash risk and lower emissions). For that reason, and for alignment with the analysis completed for the application for listing, a mid-way point is used, with sensitivity tests included for completeness.

[redacted]

The counterfactual we adopt is that the annual production level under each scenario is the amount lost from the Auckland supply base. Equivalent volumes must therefore be sourced from the next available alternatives at higher delivered costs. The economic benefits of the Project are the costs that this counterfactual imposes on the market and broader economy (avoided costs). This framing is conservative. It does not rely on the precision of demand projections, only on the recognition of acute market need.

There is an alternative scenario in which the quarry exhausts its resources within 50 years. In the event of higher demand, the extraction profile could be higher than in even the high scenario. We have not modelled this outcome but note the potential for net benefits to be even higher if the higher demand profile eventuates.

This approach to selecting alternatives has several caveats. The exact mechanisms by which supply displacement would occur are not as simplistic as the modelling suggests. In practice, the response to Hunua Quarry's closure would be some form of cascading redistribution across multiple sources. Both Smythes and Maungaturoto already supply the Auckland market to some extent. Under the counterfactual, they might need to supply volumes above their current output levels, which may not be viable. To the extent to which those sources could not fully absorb the shortfall, additional volumes would be required from even further afield, at an even higher delivered cost. The use of Smythes and Maungaturoto in the modelling therefore represent a best-case comparator. The avoided cost estimates from this modelling are therefore a floor, not a ceiling.

5.3 Direct economic effects: capital and operational expenditure

Hunua Quarry is a significant economic entity. In the two most recent financial years (FY23, FY24), annual revenue from the Quarry has been [redacted] the generation of which demonstrates the value of the resource produced. It also provides a sense of scale for considering the associated outlay on plant and labour.

The Project comprises several categories of economic expenditure. Not all of these are net additional economically because some spending at Hunua would happen in the absence of the Project. The Quarry has approximately 12 years of extraction potential under the current consents. During this time, the Project involves several areas of spend to prepare the site and operations for continued extraction, which includes the construction of the haul road, realignment of the Mangapū Tributary, investment in plant and stripping work on the new site as well as the ecological restoration required to mitigate the impacts on indigenous biodiversity. Conversely, labour and fuel costs are considered implicit – i.e., they would continue in the absence of the Project – so are excluded from the analysis until 2039 (when the existing regional consents needed to extract rock expire). In this way, the analysis only includes expenditure that is genuinely additional to the counterfactual, that would not otherwise occur in the absence of the Project.

Table 14 in the Appendix contains a detailed breakdown of all the modelled costs associated with the Project.

To assess the economic impacts of this spending, each element is analysed through an Input-Output (IO) framework. This method traces how direct spending spreads through the economy and generates successive rounds of purchasing activity, generating output and employment beyond the initial stimulus. These patterns are described in the supply-use tables from Stats NZ.

IO frameworks are a well-established tool in economic assessments. However, they are subject to known limitations, which have been scrutinised in recent FTAA decisions, and which this analysis addresses directly. IO models measure gross economic activity; they do not represent net welfare gains. There are opportunity costs of the labour, capital and materials used by the Project – in a fully employed economy, resources are drawn from one project or sector into another. Therefore, the IO results are included to show the scale and nature of the Project's economic footprint.

The Waihi North panel noted that significance under the FTAA is an indication of scale, rather than determined solely by whether regional or national GDP will change appreciably – in other words, that an IO framework is an appropriate tool for assessing the scale of effects. Recent decisions and Draft decisions, such as The Pound Road Industrial Development (FTAA – 2505-1057) draft decision, which states (at para 677), that:

> ***We have not accepted that the FTAA requires a full monetised cost-benefit analysis****. Consistent with the reasoning of the Waihi North Project Panel, economic disbenefits should be recognised where material and capable of monetary assessment, but environmental and other non-market effects need not be monetised. Rather, we consider that we should consider the economic benefits of the Proposal and then move on to the disbenefits that we have been alerted to and weight the same, as part of our assessment of the extent of the regional benefits and our proportionality assessment.*

On that standard, IO analysis retains informational value even without the welfare interpretation provided by a cost-benefit analysis: it establishes the order of magnitude of economic activity and can identify the breadth of sectors affected. For example, in our analysis, plant expenditure is allocated to the rental and hiring services sector[30]. 46% of the industry's gross inputs are comprised of imports and fixed capital consumption (depreciation), which demonstrates the extent of leakages that do not re-circulate through

[30] This excludes real estate. It captures things like heavy machinery hiring.

the economy. The IO model captures this, yielding relatively low multipliers, hence reduced value added and employment outputs relative to stimuli in other sectors.

Table 5 shows the value-added impact estimates from project expenditure. The figures are presented in 2026 prices and discounted back to 2026 using a 5% discount rate.[31] There has been significant producer inputs cost inflation in the years since 2020, the year of the most recent supply-use tables, which also suppresses value added due to lower dollar purchasing powers.

[redacted]

[redacted]

All direct value added is concentrated entirely in Auckland because it is assumed the spending all occurs in that region. This totals an estimated $116m between 2026 and 2106 (adopting the $PV_{5\%}$ metric). Indirect value added (derived from the money spent with suppliers and their suppliers) is estimated at $71.8m, with the majority (79%) of this occurring in Auckland. Induced value added (based on worker spending from directly and indirectly impacted sectors) is estimated as [redacted] with 76% expected to be in Auckland.

Table 6 shows the employment impact estimates from the Project expenditure. These are unaffected by discounting and are presented in Modified Employment Count (MEC) years. Total direct employment is estimated to be 2,432 job years, which averages to 30 jobs per year. This is lower than current employment

[31] It is noted that both the PV figures, and the assessment of avoided costs discussed further below, differ from the assessment provided by Market Economics to support the application for listing within Schedule 2 in May 2024. These differences are a result of methodological improvements and some changing project parameters including: a more refined approach to maximum pit extent and/or depth to manage environmental effects and respond to the existing constraints of the site; associated extraction profiles and spending assumptions; and updated assumptions regarding when excavation reaches 'new rock' (i.e. rock beyond existing consented levels). Notwithstanding the above, we maintain our view that the project has significant economic benefits, for the reasons identified in this report.

on the site, which is partly explained by the delay in allocating labour costs, but also the capital-intensive nature of the industries in which spending is modelled.

Table 6 - Employment Estimates from Project Spending (MEC Years)

Activity	Region	Direct	Indirect	Induced
Stripping	Auckland	334	409	347
	Rest of North Island	0	64	88
	Rest of NZ	0	34	42
Plant	Auckland	1,755	1,285	1,015
	Rest of North Island	0	189	253
	Rest of NZ	0	112	123
Labour	Auckland	308	378	320
	Rest of North Island	0	60	81
	Rest of NZ	0	31	39
Haul Road	Auckland	6	7	5
	Rest of North Island	0	1	1
	Rest of NZ	0	0	1
Ecological Resoration	Auckland	30	12	8
	Rest of North Island	0	2	2
	Rest of NZ	0	1	1
Total	**Auckland**	**2,432**	**2,091**	**1,694**
	Rest of North Island	**0**	**316**	**426**
	Rest of NZ	**0**	**178**	**205**

5.4 Avoided costs

5.4.1 Avoided Transport Costs

This section translates the transport distances that would be travelled by alternative sources of aggregate at Smythes and Maungaturoto Quarries into quantified avoided costs. To ensure the analysis represents the additionality of the new consent, forecast production figures are subtracted from the recent average annual site production level of 2.72 million tonnes. After 2039, all production is assumed to be net additional. Table 7 shows the gross production and the net figures (which we model).

[redacted]

We assume that Hunua Quarry's product is delivered to four locations, shown in Table 8. Note that these are estimates based on recent history and are used as a proxy for the actual destinations of the aggregate. The weighted average haul distance is 17km for Hunua, 53km for Smythes and 136km for Maungaturoto.

Table 8 – Distance to Aggregate Destinations (km) and Share of Routes

Destination	Hunua	Smythes	Maungaturoto	Share of product
East Tamaki	26	68	124	10%
Penrose	31	72	117	10%
Papakura	5	53	137	20%
Drury	18	47	141	60%

In order to calculate transport costs, we assume that the costs per kilometre tonne are $0.55 for the first 20kms, $0.43 for the next 20kms and $0.38 for distances above 40km. This aligns with average price schedules for delivered material. Table 9 shows estimates for the total transport costs between Hunua, Smythes and Maungaturoto for the net additional production in Table 7. In the central (mid) scenarios, relative to Smythes, transport costs would be $478m lower over the 80-year appraisal period; relative to Maungaturoto these are $1.47bn.

Table 9 - Transport Costs Across Destinations ($m)

Scenario	Low	Mid	High
Transport costs (PV @ 5%)			
Hunua	$285	$292	$367
Smythes	$752	$770	$967
Maungaturoto	$1,722	$1,762	$2,213
Avoided Costs (Net Benefits)			
Difference to Smythes	$467	$478	$600
Difference to Maungaturoto	$1,437	$1,470	$1,846

We note that due to the effects of discounting at 5%, these values differ very little from the impacts generated by the first 35 years of production – which aligns with the initial term of the regional resource consents required. In that timeline, the Avoided Costs (Net Benefits) compared with Smythes are $329m for Low, $341m for the medium and $447m for the high.

5.4.2 Avoided Social Costs

The social cost of crashes is calculated from Ministry of Transport Te Manatū Waka data on fleet statistics and the social cost of road crashes and injuries. These social costs are due to changes in distance travelled. With every additional kilometre travelled by trucks, the likelihood of an injury, serious injury, or death marginally increases. Between 2021 and 2023, vehicles in New Zealand travelled 47.5 billion kilometres on average each year.[32] Based on the average cost of crashes[33], converted to 2026 prices using CPI, we derive a per kilometre costs. Truck loads are all assumed to be 30 tonnes. In reality, some half loads or smaller loads are likely and so a greater number of kilometres must be travelled to deliver the same quantity of produced aggregate — in turn this means that these estimates probably undercount the true distance travelled and therefore total costs.

[32] Annual Fleet Statistics – Ministry of Transport Te Manatū Waka

[33] Social cost of road crashes and injuries – Ministry of Transport Te Manatū Waka

Table 10 - New Zealand Crash Statistics

Crash Type	Average Count (2021 - 2023)	Average Cost Per Crash (2026 prices)	Average Cost Per Year	Cost per Km
Fatal	307	$17.43m	$5.97bn	$0.13
Serious	3,905	$0.96m	$3.74bn	$0.08
Minor	26,816	$0.11m	$3.03bn	$0.06

Table 11 shows the social costs associated with the truck kilometres for delivering the net additional production to the aggregate destinations out to the 80-year horizon. The central scenario estimates costs to be $20m higher if the product came from Smythes and $57m higher if it came from Maungaturoto.

Table 11 - Social Costs of Crashes from Truck Kilometres ($million)

Scenario	Low	Mid	High
Social costs (PV @ 5%)			
Hunua	$9	$10	$12
Smythes	$29	$30	$37
Maungaturoto	$65	$67	$84
Avoided Costs (Net Benefits)			
Difference to Smythes	$20	$20	$25
Difference to Maungaturoto	$56	$57	$72

For 35 years, the benefits relative to Smythes are $14m for low, $14m for medium and $19m for high.

5.4.3 Avoided Emissions costs

Two types of emission cost are calculated for the analysis:

- First, the health costs from particulate matter (PM2.5), nitrogen oxides (Nox), carbon monoxide (CO) and volatile organic compounds. Using the emissions factors from the New Zealand Transport Waka Kotahi Vehicle Emissions Prediction Model (VEPM), we calculate the emissions per km travelled.[34] Again, the vehicle fleet is assumed to average 30 tonne loads from the quarries, but emissions costs are calculated on both outward and return journeys. Damage costs are taken from the Monetised Benefits and Costs Manual (v1.7.4, August 2015), updated to 2026 prices using the RBNZ CPI inflation index[35]. The costs are differentiated for urban and rural environments, reflecting the substantially higher health impact of emissions in urban areas. To account for this, each origin-destination route is allocated a weighted urban/rural split based on the route, with Drury representing the Southern boundary and Albany the North.

[34] New Zealand Transport Waka Kotahi Vehicle Emissions Prediction Model (VEPM). Accessed 20/02/2026. Fleet settings: input year = 2026; 20 – 28t articulated; 50% load.

[35] Monetised benefits and costs manual – NZTA (v1.7.4, August 2015, accessed 20/02/2026)

- The second category is greenhouse gas emissions, which are monetised using the Treasury's shadow price of carbon. This reflects the cost of mitigation rather than direct environmental damage. The central price path is used, which is $145 per tonne in 2026 at 2026 prices, but increases to $585 per tonne by 2070. For years beyond 2070, we increase the price by 3% per year, in line with the change from 2069 to 2070.

Table 12 shows the PV of environmental costs over the 80-year appraisal period. Compared with Smythes and Maungaturoto under the medium scenario, total environmental costs are estimated to be between $99m and $144m lower if the Project proceeds. These avoided costs are the benefits.

Table 12 - Environmental Costs Summary ($NZ million, 2026 prices)

Scenario	Low	Mid	High
Environmental costs (PV @ 5%)			
Hunua	$82	$83	$104
Smythes	$288	$294	$368
Maungaturoto	$390	$398	$496
Avoided Costs (Net Benefits)			
Difference to Smythes	$206	$211	$264
Difference to Maungaturoto	$308	$315	$392

Over a 35-year appraisal period, the benefit values are $141m for Low, $146m for Medium and $191m under the high production scenario.

5.4.4 Total Quantified Impacts

Table 13 shows the total avoided costs, summing the preceding tables. The costs of getting the aggregate from Smythes are nearly three times higher, and nearly six times higher from Maungaturoto. This reinforces the inefficiencies of sourcing the aggregate from out-of-region. If The Project did not proceed, it is likely that aggregate would have to come from further away – i.e., quarries not included in this modelling – where costs will be an order of magnitude higher than even these alternatives. Under the central scenario, the avoided costs of the Project compared with sourcing from Smythes are $709m over the 80-year duration of the Project and $1.84bn from Maungaturoto.

Table 13 - Transport, Social and Emissions Costs ($NZ million, 2026 prices)

Scenario	Low	Mid	High
Total Qujantified Costs (PV @ 5%)			
Hunua	$377	$385	$483
Smythes	$1,069	$1,094	$1,372
Maungaturoto	$2,177	$2,227	$2,793
Avoided Costs (Net Benefits)			
Difference to Smythes	$693	$709	$889
Difference to Maungaturoto	$1,801	$1,842	$2,310

Combining the 35-year benefit estimates, under the central scenario sees benefits of $501m compared with sourcing from Smythes and $1.30bn if sourced from Maungaturoto.

5.5 Value of the aggregate resource

The average price of aggregate in Auckland is $24.12 (2026 prices)[36]. At Hunua's recent average production level (2.72m tonnes), this implies [redacted] in annual sales revenue. Under the high production forecast of 3.30m tonnes per year, this would rise to [redacted] The Project is anticipated to yield over [redacted] of aggregate in total on the high production forecast, which represents a total resource value of [redacted] This illustrates the scale of the resource's gross value. If the aggregate is not extracted, it would represent a significant underutilisation of resources.

Furthermore, local extraction also retains the value chain within the Auckland economy. The product does not have value while it is in the ground – it acquires value when it is processed and delivered to construction sites. [redacted] represents an estimate of latent demand for this input, and the Project enables the realisation of this value.

5.6 Operational Efficiency: the Western Haul Road

The construction of the Western Haul Road is a significant component of the Project's capital expenditure. It represents investment in the site's productivity and operational efficiency. It will reduce adverse effects of quarrying such as emissions, vehicle usage and tyre wear.

Winstone has provided information that the new proposed haul road nearly halves the average circuit distance from pit to crusher from 2.3km to 1.2km, and lowers the elevation gain from 142m to 80m. In turn, this will reduce the calculated circuit time by 33%, from 16.6 minutes to 11.2 minutes per truck. This translates into a 32% increase in tonnes delivered to the crusher per scheduled hour per truck.

Taken together, the reduced distance, elevation gain and associated moving time will bring major efficiency gains. Firstly, it should enable the number of trucks in the fleet to decrease from 6 to 4. It will also lower fuel burned per truck and per hour, and the associated costs. Preliminary estimates put the annual fuel savings at $1.8m (**PV of $31m** over an 80-year appraisal period), with tyre costs also expected to fall by more than half. I note that as diesel has significantly increased in price recently – these estimates are likely to be overly conservative.

These efficiencies feed into the delivered price of aggregate, improving outcomes for the construction industry and eventual consumers.

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[36] Figure adjusted for inflation from Auckland average for 2024 ($23.20)

5.7 Qualitative Effects

The quantitative effects above do not capture all of the economic impacts likely to arise from the Project. This section identifies and describes effects that are directionally clear and economically significant but cannot be expressed quantitatively or monetised. A number of qualitative effects have been discussed throughout the report, where relevant, the rationale is developed further here.

- **Supply chain resilience.** The existing constraints in Auckland's market mean it is very exposed to supply shocks. The temporary disruption or closure of a major aggregate source could result in project delays, price escalation and potential resource rationing. Hunua Quarry's continuation preserves one of Auckland's three most significant sources of aggregate, protecting a large share of the region's production capacity.
- **Competitive market effects.** The aggregate market would benefit from more competition. Entry barriers are high and consenting timelines are long. In this market, the removal of a major supplier does not lead to a smooth redistribution of demand, it strengthens the price-setting power of remaining incumbents. Hunua's continuation exerts downward pressure on gate prices. This benefit will accrue primarily to construction firms, infrastructure providers and, ultimately, households and businesses that bear the costs of construction.
- **Business continuity and operational maturity.** Hunua has a century of operational history, established relationships with major construction firms, council and infrastructure agencies. These relationships lower friction and thus decrease project risk for consumers of aggregate.
- **Housing and infrastructure delivery.** As discussed in Section 4.4, each new dwelling in Auckland requires approximately 250 tonnes of aggregate, and the construction of a single kilometre of two-lane motorway requires approximately 14,000 tonnes. Auckland's housing consent outlook and the Government's infrastructure investment commitments signal a sustained forward demand profile that local supply must be positioned to service. The Project is aligned with Government policy and will ensure a reliable, proximate source exists to meet a share of this demand without imposing the cost premiums associated with inter-regional and long-haul supply.
- **Enabling effects on the broader economy.** Aggregate is a foundational input. Its economic impact is therefore not confined to the construction sector – it is captured through the infrastructure that construction delivers. Reliable, cost-efficient infrastructure supports the movement of goods, people and information, and is a determinant of investment decisions, regional competitiveness and long-run productivity. Addressing Auckland's infrastructure deficit ($125bn in 2026 prices) requires significant construction activity. Equally, exposure to natural hazards, such as that illustrated by the January 2023 flooding, demands resilient infrastructure to mitigate damage and access to construction materials for post-event recovery. A constrained aggregate environment undermines capacity on both fronts. The Project supports the construction supply chain and therefore the broader economy through a range of channels.
- **Adverse economic effects.** No significant material adverse economic effects have been identified. There are approximately 38 dwellings that may be impacted by the extension of the quarry. Noise, dust and other externalities associated with the Project have been identified in technical reports that accompany this application. Mitigation measures will be implemented to minimise any effects

on these properties[37] and the environment overall. And, as they are discussed as environmental costs elsewhere, they should not also be captured here. This could lead to double counting.

The Project currently operates on freehold land within the Special Purpose – Quarry Zone. However, it is expanding into the Rural – Mixed Rural Zone, and will also affect land subject to the Outstanding Natural Landscape and Natural Stream Management Area overlays. It does not displace productive land uses of equivalent value. Nor does it suppress the viability of competing local supply. It adds to this supply in a market where consented capacity remains below estimated demand. Ecological restoration will offset the negative impacts on the natural environment, in addition to generating modest GDP and employment benefits.

[37] The effects may be reflected in changes in property values. RMA 1991 case law suggests that changes in property values should not be considered as an economic effect, given the assessment of impacts on the environment are also considered as it would lead to double counting.

6 Statutory assessment

On the basis of our assessment, the Project delivers significant economic benefits to Auckland, that fall within the meaning of significant under the FTAA 2024. The benefits are most directly expressed through avoided costs: the transport, emissions and social costs that would otherwise be incurred supplying equivalent volumes from the next best alternatives in Waikato and Northland. Using Smythes (Waikato) and Maungaturoto (Northland), we model a conservative counterfactual, demonstrating the scale of potential impacts. In reality, in the absence of Hunua, it is likely that building and infrastructure costs would be higher because aggregate would need to be sourced from further afield.

In addition to the absolute quantum of costs being material in the regional context,

- there will be extensive spillover effects throughout the supply chain;
- the resilience contribution is important given the nature of Auckland's aggregate supply deficit; and
- the Project will have major enabling effects, ensuring aggregate scarcity is less of a binding constraint on construction viability.

The Project aligns with the Government's Going for Growth agenda by supporting infrastructure investment and the construction sector. It is also positive for climate change mitigation, as demonstrated by the emissions cost savings attributable to shorter haul distances relative to counterfactual sources. Every tonne of aggregate that Auckland sources from Hunua rather than Waikato or Northland involves fewer heavy vehicle kilometres, lower fuel consumption and lower carbon emissions. Over the lifetime of the consent, this sums to a significant emissions saving.

7 Conclusion

The Project is supported by a compelling economic case under the Fast-Track Approvals Act. The Project will deliver significant and sustained benefits to the Auckland region, both throughout the preparation period and after 2039 (the year in which many of the consents related to current extraction and processing expire) to 2106. The resource continues from the current pit, and there is likely up to 80 years of resource at projected extraction rates. Hunua Quarry's primary function is not to create new productive capacity but to prevent the loss of existing supply and the associated market consequences. By allowing this, Auckland avoids the need to establish replacement production capacity, which would involve significant lead in time, high capital outlay and would fail to leverage the existing advantages that Hunua Quarry benefits from, such as established relationships and operational expertise.

The construction of the western haul road as part of this project nearly halves the pit-to-crusher circuit distance, reduces circuit time by 33% and yields estimated fuel savings with a PV of $31m, while enabling the fleet to reduce from six trucks to four.

The effects are analysed in three ways. First, the gross effects of project expenditure are analysed using an Input-Output model. While the shortfalls of this method are discussed in the report, the outputs demonstrate significant value added and employment impacts associated with the spend level that the Project will require. Second, and in addition to this analysis, avoided costs associated with shorter haul distances are monetised as lower transport costs, lower social costs related to fewer crashes and lower emissions. Third, qualitative effects and the gross resource value are analysed and discussed.

The quantified costs are conservative. The demand figures modelled are significantly below the proposed capacity under the consent application of 5.4 million tonnes per annum. If Hunua's production increases above the modelled scenarios, and, given Auckland's aggregate deficit is also expected to widen over this period due to population growth, the analysis understates the impacts by at least the margin of forecast undercount. Additional production is likely to displace the most distant alternative supply in the first instance. This therefore has the highest marginal benefit. Similarly, the counterfactual used is generous. Replacing over 3 million tonnes per year would likely require sources even further away than the selected alternatives. The analysis assumes that Hunua's production could be sourced from those alternatives without delay or a price premium beyond the transport cost differential. In a market where new entrants must recoup significant costs borne to establish a site, their gate prices might need to be higher, raising those costs and therefore the gap between Hunua Quarry and the alternatives. We do not model gate price differentials, however.

The indicative Input-Output modelling estimates that development and operation of the Project will generate approximately;

- [redacted] in direct value added,
- [redacted] in indirect value added, and
- [redacted] in induced value added.

This is concentrated predominately in Auckland. Direct employment associated with the spending is estimated at 2,432 job years, averaging approximately 30 roles per year. These figures are dampened by the capital-intensive nature of plant expenditure and exclusion of certain costs, notably labour, prior to 2039.

Against the Smythes counterfactual, the Project avoids;

- $467m - $600m in discounted transport costs over the period to 2106,
- $20m - $25m in social costs from additional crash risk over the period to 2106, and,
- $206m - $264m in environmental costs from increased heavy vehicle emissions over the period to 2106.

The equivalent costs for the Maungaturoto counterfactual are significantly higher.

The Project unlocks access to a maximum of [redacted] tonnes of aggregate, representing a gross resource value of [redacted] at current market prices. Without this consent, there would be a significant underutilisation of this resource in a region where consented capacity already falls short of demand.

Beyond the quantified effects, several other impacts are economically significant. For example, the Project preserves supply chain resilience and exerts downward pressure on gate prices, which will flow through into lower construction costs and, ultimately, to households and businesses.

Assessed against the FTAA economic benefits framework, the Project satisfies the Act's criteria and does so across multiple dimensions. The avoided cost analysis alone estimates regional economic benefits of at least $693 million under the most conservative counterfactual. The IO results confirm the economic scale, with qualitative effects being unambiguously positive. The economic case for the Project is therefore strong and will provide significant regional economic benefits.

8 Appendices

8.1 Deriving aggregate demand estimates

This method comes from *Futureproofing Access to Aggregate* (2024), McIlrath & Harris.

Data from NZP&M, adjusted with the Fulton Hogan 2017 differential, is compared to the quarry-level data from Inside Resources. Similar to NZP&M, the Inside Resources data has limitations. Submission of information is voluntary, meaning production figures are not available for each quarry. In some cases, a range is given for production, from which we take the lower bound value. The tonnage data does not delineate production by material, meaning where quarries report producing aggregate (rock) as well as materials that would not be used for aggregate, the total tonnage includes each element. This combination is rare, however. In nearly all cases, all the materials listed could be used for aggregate. Production values tend to be given in tonnes, but for some quarries the value is cubic metres, which necessitates conversion. Depending on the material, square meters are converted to tonnages based on standardised weights of loose material, ranging from 1.04 – 1.65m^3. Where multiple materials are listed, an average factor is applied. Production data are available for the largest quarries in New Zealand. Working with spatial analysts at AQA, we created a dataset of all operational commercial quarries to identify gaps in the Inside Resources database.

Where data are unavailable, an estimate of production is derived using employment data[38]. Across the industry, each full-time employee classified as working in quarrying and construction material mining, as defined by 6-digit ANZSIC06 codes[39], is associated with around 27,000 tonnes of aggregate production. Quarries employ many more people than reported in the employment data but under classifications that group them with other activities, so we cannot identify them. For example, drivers of trucks or site managers are likely to have different codes. This is evident in that some quarries do not have any employee counts in their SA1 or SA2. Production per employee is therefore expected to be higher than it would be with a complete employment record. We calculate the tonnes per employee for SA1s with only one quarry, and in which we have a reported production quantum. This ignores SA1s where we cannot isolate the share of employment attributed to the known production figures. We impute remaining quarries' tonnages based on the MECs and count of quarries in the SA1. Where there is more than one quarry in a given SA1 and no production data are known, the assumed tonnage associated with that employment count is divided evenly. Where tonnages are known for the other quarries, the known quantum is subtracted from the estimate for that employment level, with the remaining tonnes split between the quarries without data. Based on an assessment of the sizes of quarries without data, an upper limit of 150,000 tonnes is assigned to any single quarry. For the remaining quarries – those with no employment data in their SA1 – a conservative posture is assumed by assuming that these produce at the 10th percentile level: 14,100 tonnes. These quarries tend to be smaller operations.

[38] Statistical Area 1 – the finest spatial area defined by Stats NZ.

[39] ANZSIC06 codes used in the definition: gravel and sand quarrying (B091100), other construction material mining (B091900), other non-metallic material mining B099000.

Average per capita production is around 9.3 tonnes. Regionally, the spread varies between 9.1 tonnes per capita in the North Island and 10.1 tonnes per capita in the South Island. We assume there are no flows between the islands and therefore the markets clear with those production and demand values.

8.2 Project Costs

Table 14 shows the costs in real terms, 2026 prices, included in the Input-Output modelling. Fuel and labour expenditure are excluded until 2039, the first year in which the quarry's continued operations are contingent on the new consent.

[redacted]

8.3 Sensitivity test outputs

The outputs in this section replicate those in the main body of the report, using 2% and 8% discount rates. Because of the long appraisal horizon, the impacts are heavily influenced by the selection of the discount rate. In year 80, the PV of $1 is 0.002 (1/472) with an 8% discount rate, compared with 0.21 (1/4.8) with a 2% rate. Furthermore, only production additional to the historic average is considered a net impact of the project, so net extraction is low until the expiry of the current consent in 2039. In 2039, a PV of $1 is 0.37 using 8% and0.78 using 2%.

Table 15 - Sensitivity Tests of Value Added Estimates of Project Spending ($PV_{2\%, 8\%}$)

Activity	Region	8% discount rate			2% discount rate		
		Direct	Indirect	Induced	Direct	Indirect	Induced
Stripping	Auckland	24.6	11.2	11	64	29.2	28.5
	Rest of North Island	0	2.4	2.5	0	6.3	6.5
	Rest of NZ	0	1.1	1	0	2.8	2.7
Plant	Auckland	36.1	17.6	14.7	138.6	73.5	62
	Rest of North Island	0	2.5	3.2	0	11.6	13.7
	Rest of NZ	0	1.6	1.4	0	6.5	5.9
Labour	Auckland	6.8	3.1	3	40.1	18.3	17.9
	Rest of North Island	0	0.7	0.7	0	4	4.1
	Rest of NZ	0	0.3	0.3	0	1.8	1.7
Haul Road	Auckland	0.5	0.5	0.5	0.6	0.7	0.6
	Rest of North Island	0	0.1	0.1	0	0.1	0.1
	Rest of NZ	0	0	0	0	0	0.1
Ecological Resoration	Auckland	0.9	0.6	0.6	1.2	0.8	0.8
	Rest of North Island	0	0.1	0.1	0	0.2	0.2
	Rest of NZ	0	0.1	0.1	0	0.1	0.1
Total	**Auckland**	**68.9**	**33**	**29.8**	**244.5**	**122.5**	**109.8**
	Rest of North Island	**0**	**5.8**	**6.6**	**0**	**22.2**	**24.6**
	Rest of NZ	**0**	**3.1**	**2.8**	**0**	**11.2**	**10.5**

Table 16 - Sensitivity Tests of Transport, Social and Environmental Costs ($PV_{8\%}$)

Scenario	Low	Mid	High
Total Qujantified Costs (PV @ 8%)			
Hunua	$175	$184	$237
Smythes	$497	$524	$673
Maungaturoto	$1,011	$1,064	$1,368
Avoided Costs (Net Benefits)			
Difference to Smythes	$322	$339	$436
Difference to Maungaturoto	$836	$880	$1,131

Table 17 - Sensitivity Tests of Transport, Social and Environmental Costs ($PV_{2\%}$)

Scenario	Low	Mid	High
Total Qujantified Costs (PV @ 2%)			
Hunua	$1,022	$1,035	$1,250
Smythes	$2,904	$2,941	$3,552
Maungaturoto	$5,929	$6,005	$7,251
Avoided Costs (Net Benefits)			
Difference to Smythes	$1,882	$1,906	$2,302
Difference to Maungaturoto	$4,907	$4,970	$6,001

9 C.V.

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Professional Experience

- 2001 – 2025: Director, Market Economics Ltd
- 1996 – 2001: Senior Analyst, McDermott Fairgray Ltd.

Greg is a founding Director of Market Economics and has 30 years' experience consulting to a wide range of sectors in both the New Zealand and Australian markets. His experience covers assessment of market structure, size and change for development clients, economic impact assessment for commercial and government clients, as well as strategic policy, social infrastructure and amenity studies carried out for local councils. He has developed models to assess community needs and assess allocation networks set up to meet those needs. Greg leads 20-30 projects annually and has given expert witness evidence in local government hearings, before the EPA, the Environment Court and provided affidavits as an expert for the High Court.

Greg headed the team investigating the Canterbury Earthquake Rebuilds, labour force, materials and temporary housing requirements for government. In recent years he has led studies into infrastructure projects, Air Quality Impact modelling, as well as sector studies (in particular the Marine Industry, Quarrying and the aggregate sector and Construction). These studies draw together all aspects of inputs, to present central and local government with comprehensive assessments on economies' growth and change. Greg has also specialised in assessing Council funding mechanisms – in particular Development Contributions and Financial Contributions for both Councils and the development sector.

Greg authored the Guidebook for Growth Councils that needed to carry out non-residential land capacity and demand assessments to meet their obligations under the National Policy Statement on Urban Development Capacity (NPS-UDC). He was Auckland Council's chief economic witness with respect to Business Land in the Unitary Plan Hearings and led a number of projects around the country investigating business land requirements under the NPS for high growth Councils (Auckland, Future Proof, Queenstown). Greg has also carried out numerous economic studies in support of Fast Track applications under the COVID-19 FT Bill and the Fast Track Approvals Act 2024. Greg is currently the independent expert on the Development Agreements Committee for Waikato District Council.

Relevant Areas of Expertise

Spatial and Economic Analysis and Modelling | Input-Output Modelling | Urban and Regional Economics | Skills and Labour Force Modelling | Economic Growth Modelling | Supply and Demand Analysis | Sectoral and Specialist Market Analysis | Demand Analysis and Forecasting | Economic Impact Assessment | Policy Analysis and Advice | Infrastructure Funding and Investment | Local Government Funding | Resource Management | Strategic Advice | Peer Review

Greg has successfully completed a range of economic assessments with the following recent projects showing the breadth of relevant experience.

- Pakiri consent renewals – economic effects assessment (consent assessment, council hearings)
- Brookby Quarry Stage 1. Economic assessment to support Expansion, Environment Court
- Drury Quarry. Economic assessment and Council hearing, FTAA 2024 application
- Hunua Quarry Consent application. Economic assessment and Council hearing , FTAA 2024 application
- Waingaro Quarry Consent application. Economic assessment, FTAA 2024 application
- Kings Quarry FT application – Economic Assessment
- Drury Metropolitan Centre – Economic Impact Assessment and Council Hearing
- Drury Metropolitan Centre – Development Contributions Assessment
- Ryman Healthcare Pukekohe – Development Contributions Assessment, Council Hearing
- Retirement Village Association – DC Assessment nationwide for 20+ Councils
- Wetland Provisions of NES for Freshwater – Economic Assessment of Aggregate loss for regions
- West Coast Coal – Peer review of Economic Assessment
- Waihi North Gold Mine – Peer Review of Economic Impact Assessment for Fast Track
- Martha Mine expansion – Economic peer review assessment
- Industrial Land Demand – Matamata Industrial land demand, private sector client
- NPS-UDC – Guidebook author for Business Land Assessment approach
- NPS – UDC – HBDA for Future Proof, Tauranga, Queenstown Lakes, Dunedin City
- NPS-UD HBDA assessment for Future Proof, oversee others.
- Marine Industry Assessment – Cracker Bay development, Wynyard Quarter
- Selwyn District – PC 73, assessment and critique of HBA prepared for SDC in support of development
- Lincoln Residential Development – Residential Demand modelling, Council evidence
- Ohoka PC 31 – Demand modelling, HBA critique, Council evidence for developer
- Auckland Prison EIA – Fast track economic assessment for Auckland Prison, Department of Corrections
- Dunedin Heritage Protections – Assess economic impacts of adding 146 properties to heritage protection list
- Waimanawa Estate Warkworth – Retail Demand assessment and economic impact assessment incl. council evidence
- Waerenga and Rangiriri Solar FT – Peer review of economic impacts for EPA
- Hamilton City Development Contributions Growth Model
- Peacocke Structure Plan – Economic Review and evidence for HCC
- Development Contributions High Court Affidavit – in support of Hamilton City DC Policy CIV-2020-419-202
- Ravenswood Economic Impact Peer Review – Infinity Holdings, overturned Hearing Panel Verdict.
- Other Fast Track Assessments: Drury Metropolitan Centre
    - Haldon Solar

- Karori Metlife Care Village
- Mill Road Stage 1
- Opunake Solar Farm
- Summerset Rotorua Village
- Summerset Half Moon Bay
- Waihi North Mine

- Tauranga Crossing PC 33 – Demand assessment and centre assessment, Council Evidence
- NZTA Silverdale PPC 103 – Financial Contributions potential, Council evidence
- NZTA Cambridge to Piarere Economic Impact Assessment – Council evidence
- Development Contributions – High Court Affidavit, Developers vs North Shore City Council.

Tom Harris – Economic Modeller and Review

Senior Consultant

MSc (Economics); BSc (Economics)

- [redacted]
- Location: Wānaka

Professional Experience

2023 to date	*Senior Consultant – Market Economics*
2021 – 2023	Economist – Department of Education (UK)
2019 – 2021	Fast Stream Assistant Economist – Department of Education (UK)
2018 – 2019	Economic Scholar – University of Exeter

Tom joined Market Economics from the UK Civil Service in 2023 where he worked as an economist across a challenging portfolio of projects and sectors. During the Covid-19 pandemic he was the principal analyst in the Department for Education modelling the pandemic's impacts on Children's Social Care. His other roles included leading on graduate outcomes analysis, supporting high-profile national policy implementation, being embedded in the permanent secretary's office, and working closely with external academics and stakeholders.

Tom taught undergraduate macroeconomics at The University of Exeter, then completed his Master's part-time alongside his work in the UK Civil Service. Using his access to novel administrative governmental datasets, he authored research into topics which included comparing the scarring effect on early-career earnings of graduating during the Covid-19 years with the Global Financial Crisis, and assessing whether prospective university students could be nudged into making better application choices. Tom has extensive experience working with senior officials and politicians to guide policy- and decision-making with analysis. As a proficient and interested coder, Tom has written a book on the R programming language and published open-source software packages to aid data analysis.

Tom has founded and runs Good with Data, a charity that connects analytical professionals to third sector organisations, enabling charities to benefit from pro bono expertise and for analysts to contribute their time towards meaningful causes productively.

Areas of Expertise

Econometrics| Game Theory | Empirical Industrial Organisation | Mathematical and Algorithmic Modelling | Machine (Statistical) Learning Models | Quantitative and Qualitative Research Methods | Public Economics | Economic Appraisal | Sectoral Analysis | Cost Benefit Analysis | Demand Analysis and Forecasting | Policy Analysis and Advice | Business Cases | Project Management

Tom has successfully completed a range of economic assessments with the following recent projects showing the breadth of relevant experience.

- Fergursson and Bledisloe Wharfs Extensions. Fast-Track Economic Impact Assessment for the Ports of Auckland.
- Brookby Quarry Stage 3. Economic assessment to support Fast-Track Application.
- Southern Screenworks fill site application. Fast-Track Economic Impact Analysis.
- Auckland Prison. Fast-Track Economic Impact Assessment for the Department of Corrections.
- Dirtworks consent application. Fast-Track Economic Analysis.
- Lochaburn Quarry. Fast-Track Eligibility Assessment.
- National Aggregate Sufficiency. Research for Aggregate Quarry Association into inter-regional dependence for aggregate and national supply sufficiency.
- Haldon Solar Farm. Economic Impact Assessment.
- Waerenga and Rangiriri Solar Farms. Peer reviews of economic assessments.
- Opunake and Carterton Solar Farms – Economic Impact Assessments.
- Dunedin Heritage Protections. Economic Impact Assessment for Dunedin City Council focussing on development feasibility and regression analysis of property price impacts.
- Hamilton WISE model to developer contributions modelling.
- Waihi Gold Mine extension. Economic Assessment and Peer Review of Applicant's assessments for Hauraki District Council.
- Forecasting the price path of Greenshell Mussels. VAR and ARIMA forecasting methods for NZTE.
- Taylorville Resource Park. Resource Consent Economic Impact Assessment.
- Timaru Showgrounds retail park configuration and liquor store, economic effects analysis.
- Auckland Developer Contributions, assessment of economic equity impacts.
- Queenstown Lakes District impact of Airbnb and short-term rental accommodation on property prices and rents.
- Queenstown Lakes District economic impact of Queenstown Cable Car proposal.
- Auckland Council policy analysis for Plan Change 78; Plan Change 79.
- Nelson Housing and Business Development Capacity Assessment (HBA) Analysis.