Clevedon Quarry Expansion

Economic Assessment

13 April 2026

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Prepared for

Stevenson Aggregates

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Executive Summary

This report presents an economic assessment of the proposed expansion of the Clevedon Quarry, operated by Stevenson Aggregates Limited, under the Fast-track Approvals Act 2024. The assessment considers the role of aggregate in supporting regional growth, Auckland's current and future aggregate supply position, and the economic costs and benefits associated with expanding the quarry relative to a 'do-nothing' scenario.

Aggregate is a critical input into housing, infrastructure and economic development. It is a low-value, high-volume commodity for which transport costs are a key determinant of overall cost. As Auckland continues to grow, demand for aggregate is expected to increase significantly, driven by population growth, infrastructure investment, and the need to address historic infrastructure backlogs. Maintaining reliable, locally sourced aggregate supply is therefore essential to supporting Auckland's long-term growth and economic resilience.

The assessment demonstrates that Auckland currently faces a structural shortfall in locally produced aggregate and relies on imports from neighbouring regions, particularly Waikato and Northland. Under both medium- and high-growth population scenarios, this supply gap is projected to widen over time unless additional local supply capacity is enabled. Even when recently consented quarry expansions are included, Auckland is expected to remain in deficit over the medium to long term. This reliance on imported aggregate increases direct transport costs and gives rise to additional environmental and social costs associated with longer haul distances.

The current (2018) resource consent expires in 2053 and enables Clevedon Quarry to extract up to 60 million tonnes of aggregate. Under that consent the Quarry is authorised to extract up to 3 million tonnes of aggregate per annum.

The proposed expansion of the Clevedon Quarry would extend the life of the quarry by approximately 23 years (assuming consent is granted in 2026) and make available an additional estimated 90 million tonnes of aggregate (i.e., more than doubling the total volume of resource from the quarry). Clevedon is not seeking consent for increasing annual extraction limits or operating hours beyond the current consent.

The quarry is strategically located in rural south-east Auckland, close to areas expected to account for a significant share of future population growth and infrastructure investment. This proximity allows aggregate to be supplied more efficiently than from out-of-region sources, reducing transport distances and associated costs. In addition to these locational advantages, the proposed expansion is expected to deliver a range of further economic benefits associated with improved operational efficiency, production certainty and economies of scale.

Information provided by the quarry operator indicates that the revised pit design, informed by improved geological and geotechnical understanding, will improve the efficiency of resource extraction. Better access to high-quality rock and a more favourable overburden-to-useable material ratio will increase the proportion of saleable material, reduce waste and lower production costs over time. From an economic perspective, this represents a more efficient use of the resource and an increase in its overall value.

The operator's memorandum[1] (Proposed Clevedon Quarry Expansion, 24 March 2026) further suggests that the expanded quarry design will generate operational efficiencies. A larger quarry floor will enable improved on-site storage of different aggregate grades and volumes, reduce repeated handling and internal movement of material and allow for a more responsive supply to the market. Revised staging is expected to support more continuous operations by maintaining workable extraction areas and access for plant and infrastructure, thereby reducing the risk of operational disruption and supporting stable production levels. Collectively, these changes will, in the operator's opinion, improve supply reliability and reduce operating costs, delivering economic benefits.

The expansion will also enable access to a substantial volume of aggregate over an extended period, providing a high degree of long-term supply certainty for the Auckland market. In economic terms, this reduces reliance on more distant suppliers and reinforces the transport-related cost advantages identified in the quantitative analysis. The increased scale and duration of the operation will also support economies of scale, allowing capital and operational investments to be spread over a larger production base, thereby lowering average costs per tonne. While not quantified, the scale and longevity of the operation are also expected to support sustained employment and ongoing economic activity over a longer time period, thereby increasing the economic benefits generated by the resource.

The economic effects of the proposal are assessed by comparing the costs of supplying aggregate from Clevedon with sources outside the Auckland region. Smythes Quarry (Waikato) and Maungatoruto (Northland) were selected as the closest out-of-region alternatives, representing an 'at least' position. The analysis focuses on avoided costs, including transport costs, emissions costs, social costs and opportunity costs. These avoided costs represent economic benefits attributable to the proposed expansion.

When assessed over the additional 23-year operating period (2054-2076) and discounted to present values in line with Treasury guidance, the total cost of supplying aggregate from Clevedon is estimated at approximately $879.9 million (2% discount rate), compared with $1.4 billion (2% discount rate) if sourced from Waikato (Smythes Quarry) and $2.4 billion (2% discount rate) if sourced from Northland (Maungaturoto Quarry). This suggests **the benefit (avoided costs) of sourcing the aggregate from Clevedon Quarry equates between $489.2 million to $1.5 billion (2% discount rate), reflecting avoided transport, emissions and social costs.** Even under a higher 8% discount rate, the net present value of avoided costs remains significant, ranging from $50.1 million to $155.5 million. These benefits (avoided costs) substantially outweigh the estimated **opportunity cost of alternative[2] land uses**, which has a present value of **around $431,700** (2% discount rate), confirming that the proposed expansion delivers a net economic benefit at a regional scale. Under the higher 8% discount rate, the estimated opportunity cost is $40,500.

Overall, the assessment concludes that the proposed expansion of the Clevedon Quarry would deliver net economic benefits of regional significance. By improving the security and efficiency of aggregate supply, the proposal would help reduce construction and infrastructure costs, support planned growth

[1] Prepared by Bryn Llewellyn - Resource Engineer, Stevenson Aggregates.

[2] Forestry is identified as the most likely alternative land use, and the opportunity cost is estimated accordingly.

in south and east Auckland, and contribute to Auckland's ability to deliver housing and infrastructure in a timely and cost-effective manner. In this context, the proposed expansion is consistent with the objectives of the Fast-track Approvals Act (2024) and represents an economically justified response to Auckland's long-term aggregate supply challenge.

1 Introduction

The New Zealand economy is reliant on the availability of natural mineral resources, particularly aggregate. Aggregate is an essential component of both urban and rural development. It is used across many construction applications, ranging from concrete production to foundations and as drainage medium. Its role is especially pronounced in urban development and construction, enabling the delivery of homes, infrastructure and amenities that support both communities and economic growth. It plays a critical role in Auckland's built environment, serving diverse needs across residential, commercial, infrastructure and road projects.

Aggregate is a core input that supports regional growth and economic vibrancy. An efficient aggregate supply chain is critical to:

- sustain the infrastructure investment pipeline and maintenance activity, and
- minimising risks and costs associated with sourcing aggregate.

Given its significance, Auckland's future development relies on maintaining sustainable aggregate supplies and as such, expanding the Clevedon Quarry pit to secure long-term supply for the region, is crucial.

Aggregate is a low-value, high-volume commodity and transport has a direct influence on costs. Transport also generates a range of other environmental and social costs that must be considered. Auckland is reported to have an aggregate deficit and currently imports aggregate to satisfy local needs. However, importing aggregate from other regions generates transport and other costs that can be avoided by increasing local production. Avoiding costs are seen as benefits.

Stevenson Aggregates Limited (SAL) is wanting to seek consent under the Fast Track Approvals Act 2024 (FTAA, 'the Act') to expand the Clevedon Quarry pit over the next 50 years. The first step of that process is to lodge a referral application, which is the application that this report supports. The Act is designed to streamline the delivery of infrastructure and development projects that can generate significant regional or national benefits. The Act is explicitly designed to speed up decision making, improve certainty for project proponents and help unlock economic growth by reducing regulatory delays for major projects. In this context, the proposed expansion of Clevedon Quarry represents a project with the capacity to deliver benefits of regional significance. Market Economics (M.E) has been engaged to assess the economic impacts of the expansion as part of the required effects assessment.

1.1 The Proposal

Stevenson Aggregates Ltd (SAL) operates the Clevedon Quarry, located at 546 McNicol Road, Clevedon. Clevedon Quarry is a greywacke hard rock quarry supplying aggregate to the Auckland market. The Quarry has been operating in the area since 1960s/1970s (initially operated by Warren Shaw Limited) and has twice (2000 and 2018) been granted consent to expand and increase annual production. More recently in 2024, Plan Change 89 (PC89) was approved resulting in a rezoning to alter the extent of the Special Purpose - Quarry Zone (SP-QZ). SAL is proposing to expand the Quarry by extending the current

consented pit to the south and east, into the SP-QZ, and partly into adjoining Rural Production Zone (RPZ) and Significant Ecological Area (SEA). Resource consent is required to enable the expansion. SAL is not seeking to extend its operating hours or annual production volumes beyond those authorised by the 2018 consent. The aim of the expansion is to futureproof the quarry and ensure a stable, reliable long-term source of aggregate which can respond to demand as it arises.

The existing quarry pit has a finite lifespan and to provide security of aggregate supply going forward, SAL is proposing to extend extraction to the south and east of the existing pit. The proposed extension of the Clevedon Quarry is estimated to provide a total aggregate resource of around 150 million tonnes cumulatively, over 50 years. The existing consent enables extraction of up to 60 million tonnes of aggregate cumulatively, at an extraction rate of 3 million tonnes per annum. This suggests the proposed expansion could add approximately 90 million tonnes of aggregate to the market and extend the life of the Quarry by around 23 years[3]. This would provide greater certainty of supply for South and East Auckland and improve planning certainty for the quarry operator. It is expected that this certainty will support business growth, ongoing investment in plant, equipment and supporting infrastructure, and as such contribute to local employment and economic activity.

Figure 1-1 shows the proposed expansion of the pit over five stages. For the modelling, it is assumed consent is granted in 2026 and staging is as follows:

- Stage 1 2026-2036
- Stage 2 2036-2046
- Stage 3 2046-2056
- Stage 4 2056-2066
- Stage 5 2066-2076

We acknowledge the map shows the indicative staging and extraction will occur in response to demand.

SAL is not seeking an increase to the annual extraction rate or operational activities, such as truck movements, hours of operation, and so on. Clevedon Quarry currently holds a consent to extract up to 3 million tonnes of aggregate[4] per annum. Over the past three years[5], the quarry has produced between 200,000 and 330,000 tonnes of aggregate, annually, generating between 17,600 and 28,800 truck movements[6] a year, or on average 5 to 9 an hour[7]. The consent allows up to 45 quarry truck movements per hour until the sealing of the unsealed section and all of the road widening works (described in consent condition 60(a)-(f))[8]) have been completed on McNicol Road. Once the road upgrades have

[3] This assumes consent is granted in 2026. This could increase if the consent is granted later.

[4] Including overburden.

[5] August to July.

[6] Assuming 23-ton trucks and accounting for trucks arriving empty.

[7] Assuming year-round operation and accounting for empty truck movements.

[8] *Clevedon Protection Society Inc v Auckland Council* [ENV-2018-AKL-000044]; *Fulton Hogan Ltd v Auckland Council* [ENV-2018-AKL-000046] (Appeals under the Resource Management Act 1991).

been completed, Clevedon Quarry would be allowed up to 90 truck movements per hour and an average of 900 per day, with limits to the time[9] of the day truck movements are allowed.

Figure 1-1: Indicative staging of Clevedon Quarry Pit Expansion over 50 years

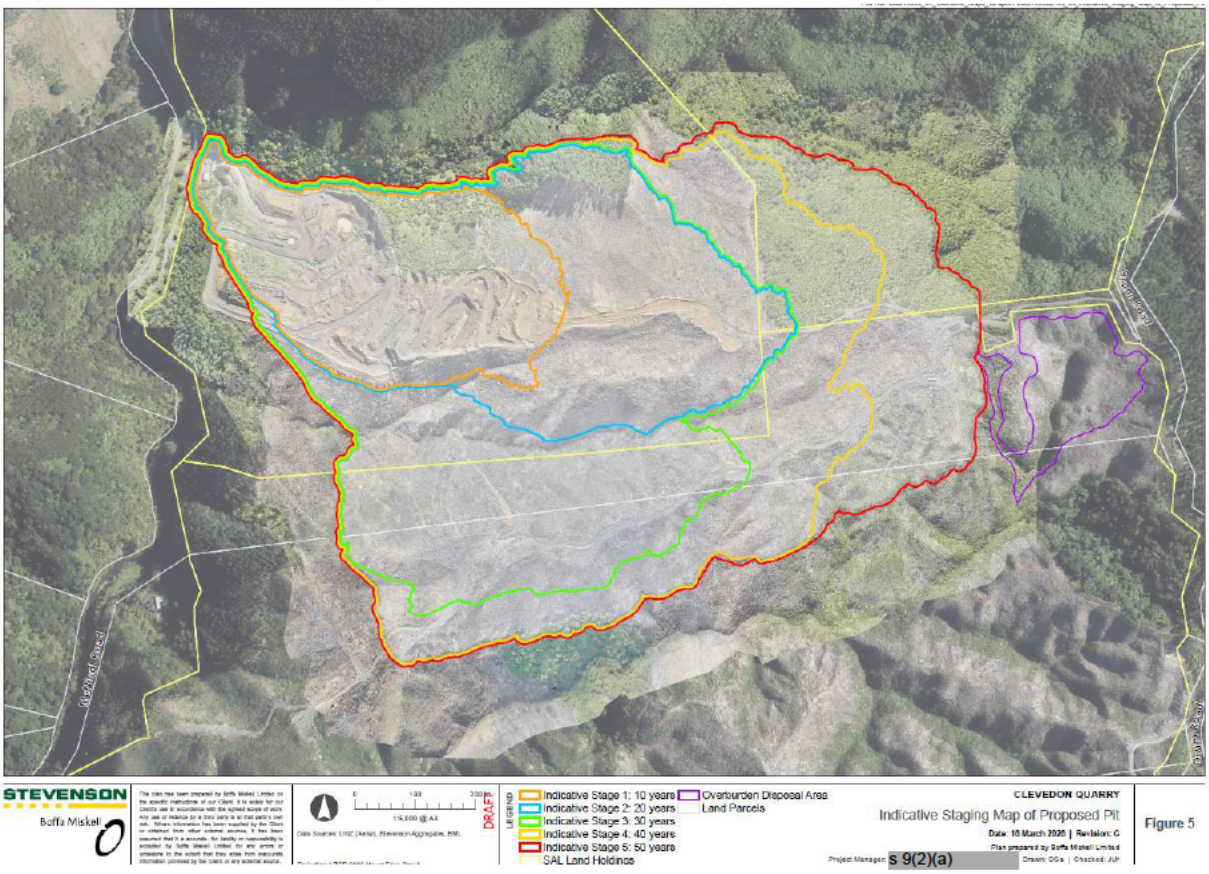


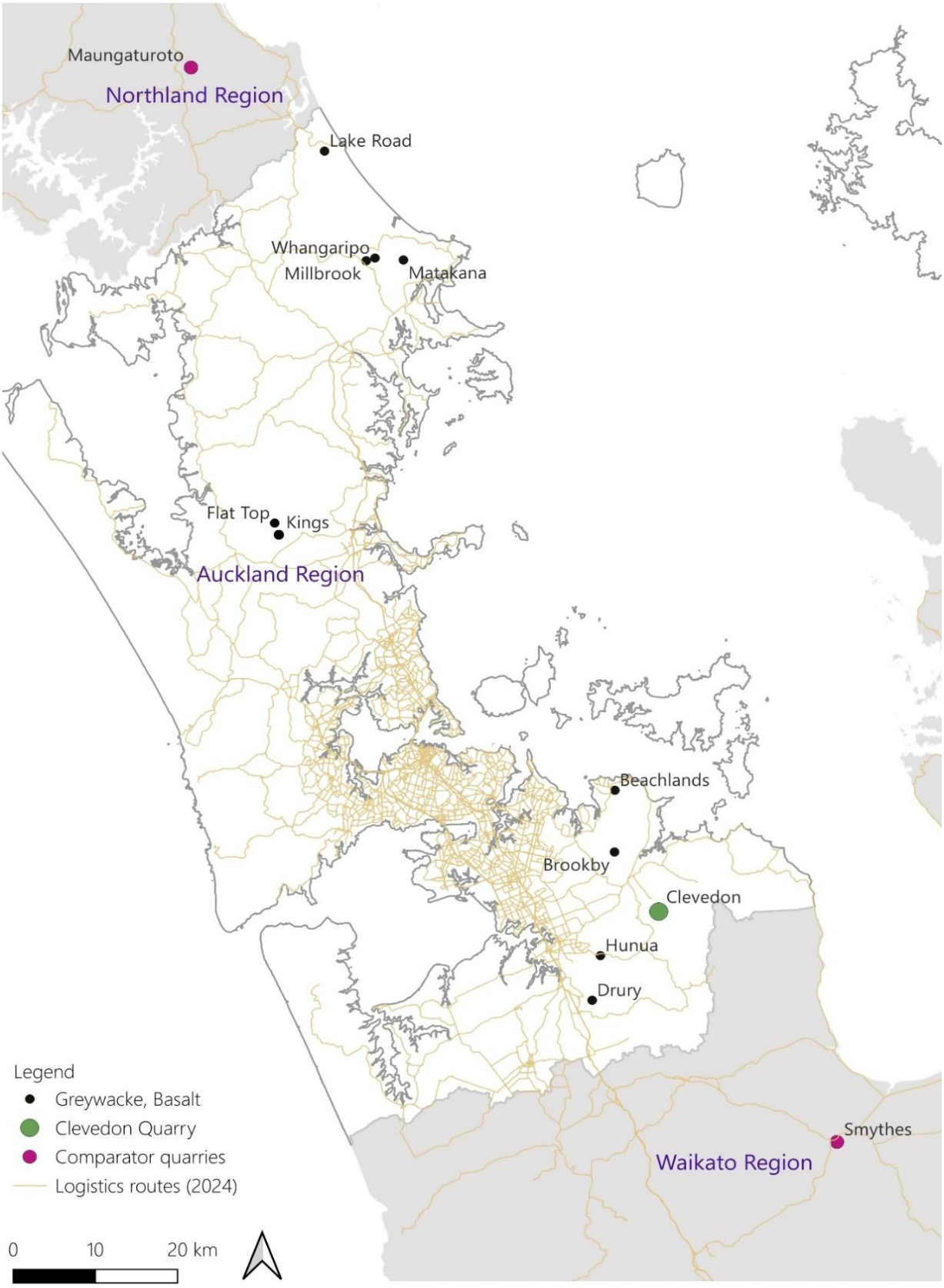
Figure 1-2 shows the location of Clevedon Quarry in relation to other existing quarries within the Auckland region supplying similar types of aggregate to the market. The map also shows the quarries outside of the region which are considered the alternative sources[10] of aggregate for the assessment in section 4. Appendix 1 contains a more comprehensive list[11] of quarries within the Auckland region, with detail about the product they supply and the owners.

[9] Truck movements are generally limited to between 6:30am and 6:00pm Monday to Friday, and between 6:30am and 1:00pm Saturday. Up to 60 days per year, movements may extend to 9:00pm Monday to Thursday. Outside these times, truck movements are only permitted for emergency works.

[10] It is not known whether the comparator quarries have sufficient operational capacity to supply the modelled level of aggregate.

[11] Quarries on Great Barrier and Waiheke islands were omitted.

Figure 1-2: Competitor and Comparator Quarries for Clevedon Quarry



The next section outlines the approach which was followed to assess the potential benefits of the proposed expansion, from an economic perspective.

1.2 Approach

This assessment examines the potential impacts of the proposed quarry extension at both the local level and within the wider Auckland setting. To understand the contribution of SAL's aggregate extraction to Auckland's economy, it is first necessary to consider the role aggregate plays within the regional economy as a whole. Historic and projected demand trends will be analysed under both business-as-usual (medium growth) and high-growth scenarios to provide a range of possible futures. This approach ensures the effects of the expansion at Clevedon are viewed in context.

The assessment is set within the context of Auckland's aggregate market, which operates with a supply shortfall and relies on material imported from Waikato and Northland. Because of this deficit, any increase in transport distance raises aggregate costs and, in turn, contributes to higher construction expenses. The proposal's effects stem primarily from avoided economic and environmental costs - specifically, reduced transport distances and the avoided need to establish an additional quarry elsewhere in Auckland to meet growing aggregate demand.

The economic assessment was completed through a staged process with two main steps undertaken. First, the Auckland aggregate market was examined and second, the potential benefits and opportunity costs were evaluated. These steps are summarised below.

Step 1: Aggregate market and outlook: This step involves situating the Quarry within the broader regional supply environment to understand how the proposed expansion fits within Auckland's aggregate needs. The analysis draws on historic trends linking aggregate production with key economic drivers such as population growth, development patterns and overall economic activity. This provides context for the essential role of aggregate and its relationship to infrastructure delivery.

Step 2: Potential economic effects (benefits and costs): Aggregate is a high-bulk, low-value product for which transport-related costs are the primary driver of economic effects. In this step, the potential economic effects are assessed against a 'do-nothing' scenario (i.e., a 'no expansion' situation in which aggregate is sourced from outside the region). This identifies additional costs from sourcing aggregate outside the region, relative to Clevedon. The net change is interpreted in terms of direct transport costs, environmental[12], social costs[13] and opportunity cost.

1.3 Data Sources

Several sources were consulted as part of preparing this economic assessment, including:

- Information provided by Stevenson Aggregates Limited.
- Market Economics' in-house regional economic dataset.
- Auckland Council information and data.
- Data from industry bodies, such as Aggregate and Quarry Association and Inside Resources.

[12] Air emissions associated with transport (health effects).

[13] Cost of road crashes.

- Infometrics Regional Gross Domestic Product.
- Central government guidance and datasets:
    - New Zealand Petroleum & Minerals (MBIE)
    - Ministry of Transport
    - New Zealand Transport Agency Waka Kotahi
    - Ministry for the Environment
- Statistics New Zealand
    - Population estimates and projections
    - Business Demography Survey
    - Linked Employer Employee Data

1.4 Caveats and Limitations

- The ratio used to estimate future aggregate demand is held constant and based on the number of jobs in the mining and construction sector relative to aggregate production. This implies that the projected demand does not account for productivity gains. It is possible that quarries could become more efficient, producing the same outputs (level of aggregate) with fewer inputs (workers/labour), lowering the per MEC ratio. This would suggest the demand in this assessment could be overstated.
- We did not endeavour to establish whether the comparator quarries (Maungaturoto and Smythes) have sufficient operational capacity to supply the modelled level of aggregate. The assessment uses these two quarries as illustrative examples of the next best alternatives to Clevedon, outside of the Auckland region.
- The assessment uses 330,000 tonnes as the annual volume of aggregate with which to assess costs and benefits of the expansion. The cost of extracting the annual consented volume (3 million tonnes) is also explored. It is assumed that the Quarry would gradually lift the annual extraction rate from the current level to the consented 3.0 million tonnes per annum in line with demand.
- Supply from the two recently approved fast track consents - Sutton Block and Kings Quarry Stage 2 - are included in the assessment, but timing and likely outcomes of outstanding applications are uncertain. Assumptions have been made about the volume and timing of additional aggregate from these quarries, to show the potential impact on the aggregate market.
- There remains a degree of uncertainty regarding the land uses that could reasonably occur on land currently zoned RPZ, if the Quarry does not receive consent to expand. It is our understanding that the area has recently been replanted in pine trees and forestry will be the most likely land use going forward.
- It is assumed that McNicol Road will be upgraded as required under the current consent, as truck movements increase in line with increased extraction (up to the annual consented limit).
- We are aware that the latest production survey covering 2024 was released by New Zealand Petroleum & Minerals (MBIE) in the latter part of 2025. It was not incorporated in this report but does not materially change any of the conclusions.
- The quantitative assessment does not account for recent volatility in fuel prices associated with ongoing conflict in the Middle East. Fuel is a key input cost in the extraction and transport of

aggregate, and changes in fuel prices can have a direct impact on the cost differentials identified in this analysis. The results in this assessment can be interpreted as a conservative position since increased fuel cost would mean the transport cost advantages associated with sourcing aggregate from a closer location, such as Clevedon Quarry, would be even more pronounced. However, we are not suggesting that fuel costs would remain elevated and have therefore attempted to look through short-term volatility.

1.5 Report Structure

The rest of this report is structured as follows:

- Section 2 provides the context for the assessment by outlining Auckland's potential growth trajectory, drawing on population projections to estimate future aggregate requirements.
- Section 3 outlines the role aggregate plays in enabling growth, noting that while growth is not driven by aggregate, it is facilitated by its availability, cost and quality. It also outlines the key metrics used when estimating aggregate supply and demand in the local context.
- Section 4 outlines the costs and benefits associated with the proposed development when compared against a 'do nothing scenario', i.e., using alternative aggregate sources.
- Section 5 provides concluding remarks.

2 Context

Auckland is New Zealand's largest and fastest growing region in terms of population, and it will remain the centre of much of the country's economic growth. Building and construction are key parts of the Auckland's growth story, supported by a diverse and dynamic economy that consistently leads national economic performance. As a major population hub, Auckland faces ongoing and emerging pressures that require significant investment in infrastructure and development.

This section provides context showing Auckland's growth performance in terms of population and the economy. Aggregate is an essential material used in many everyday applications, and as Auckland expands, the demand for aggregate will increase accordingly. To demonstrate this link, the section includes examples of current and planned development projects. It also draws on research that highlights the strong connection between aggregate demand, population growth and economic activity[14]. These relationships form the basis of the analysis presented here. The discussion begins by placing Auckland within the national context, presenting its population and economic growth performance.

2.1 Auckland's Population

Auckland remains New Zealand's largest population centre, home to around 1.8 million[15] people, which represents roughly one-third of the country's total population. Historically, Auckland's share of the national population has steadily increased, although this trend briefly reversed during the COVID period. Regardless, more than 33% of New Zealand's population resides in Auckland based on StatsNZ population estimates[16].

Table 2.1 presents population projections for Auckland and New Zealand, including both historical trends and looking forward, based on Stats NZ data.

Over the past decade (2014-2024), Auckland's population grew on average around 1.7% per annum, matching the national growth rate. During this period, Auckland contributed 34% of the total national population increase. Looking ahead, under a medium-growth scenario, Auckland's population is projected to increase at a rate of 1.2% between 2025 and 2035 (medium-growth scenario), compared to 0.8% per annum, nationally. Beyond that, Auckland's population is expected to grow at an annual rate of 1.1% on average (medium-growth scenario), compared with New Zealand population, growing 0.9% on average, annually.

[14] Wilson, D., Sharp, B., Sheng, M. S., Sreenivasan, A., Kieu, M., & Ivory, V. (2022). Aggregate supply and demand in New Zealand (Waka Kotahi NZ Transport Agency research report 693).

[15] Estimated Resident Population June 2024.

[16] Estimated Resident Population June 2024.

Table 2-1: Estimated and Projected Population Change

	Estimated Change 2014-2024 (n)	Projected Change 2025-2035 (n)	Projected Change 2036-2053 (n)	Estimated Change 2014-2024 (CAGR)	Projected Change 2025-2035 (CAGR)	Projected Change 2036-2053 (CAGR)
Auckland						
Low	277,900	136,400	201,800	1.7%	0.7%	0.7%
Medium	277,900	229,400	372,500	1.7%	1.2%	1.1%
High	277,900	322,800	538,400	1.7%	1.6%	1.5%
New Zealand						
Low	822,000	238,700	525,000	1.7%	0.4%	0.6%
Medium	822,000	473,000	839,500	1.7%	0.8%	0.9%
High	822,000	715,500	1,133,300	1.7%	1.2%	1.1%
Share of National Population change (%)						
Low	34%	57%	38%			
Medium	34%	48%	44%			
High	34%	45%	48%			

Source: StatsNZ population estimates and population projections.

Across all growth scenarios, Auckland's future expansion is forecast to outpace the national average, reinforcing its position as the country's primary hub for people and activity. This sustained growth ensures Auckland will continue to serve as New Zealand's premier destination for population and investment, driving economic development and infrastructure demand.

Using Stats NZ's population projections[17] and grouping the Local Boards into six broad areas[18] shows that spatially, the growth is expected to be distributed around Auckland. The largest increases are anticipated in the southern and central areas, followed by the west between 2023 and 2053. The shares of growth by broad area are:

- North 23%
- West 16%
- Central 20%
- East 6%
- South 35%
- Gulf Islands 0.1%

Combined, south and east Auckland account for 41% of total growth. However, when excluding the Franklin Local Board area, the combined growth for south and east Auckland is approximately 30% of Auckland's total growth. These spatial patterns are relevant because it influences where aggregate will be required. Clevedon Quarry, located in Auckland's south-east, is strategically positioned to serve these growth areas. Its proximity to south and east Auckland, along with good access to central Auckland, makes it a key source of aggregate for future infrastructure and construction demand.

[17] StatsNZ. Subnational population projections released 25 September 2025.

[18] Groupings are based on Auckland Council spatial definitions. https://voteauckland.co.nz/en/understanding-auckland-council-local-government/local-board-ward-maps.html

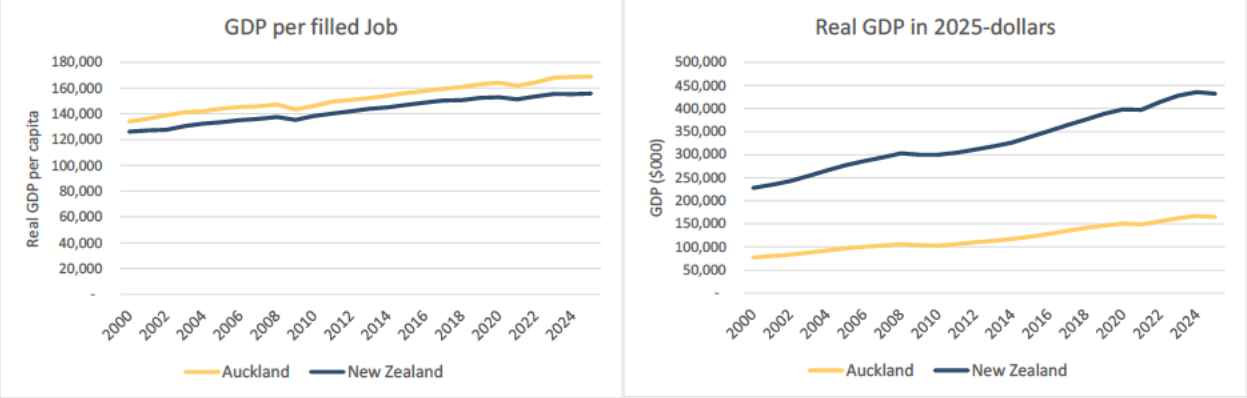
2.2 Economic Performance

Auckland remains the engine of the New Zealand's economy, contributing 38% of national GDP, up from 34% in 2010. Auckland's GDP was $165 billion in the year to March 2025, which represents a 1.2% drop in real terms. This decline was slightly larger than the national fall of 0.9% over the same period. This marks the first contraction since the Global Financial Crisis (excluding the initial pandemic year) and is linked to high interest rates, subdued consumer spending and global uncertainty. Despite this short-term dip, Auckland's economy remains 13% larger than in 2019 (pre-COVID) and 56% larger than in 2008 (pre-GFC).

Over the past two decades, Auckland's economy has expanded significantly. From $77 billion in 2000 to nearly $165 billion in 2025, the region's GDP has more than doubled, reflecting a compound annual growth rate of around 3.1%, slightly above the national rate of 2.6%. While both Auckland and New Zealand experienced downturns during the GFC and the COVID-19 pandemic, Auckland consistently outperformed most regions, particularly during recovery periods. This sustained growth underscores Auckland's role as the country's leading centre for population, investment, and economic activity.

Auckland also consistently outperforms the rest of New Zealand in terms of GDP per filled job[19], reflecting its economic structure and concentration of higher-value activities (Figure 2-1). The region's economy includes a significant share of knowledge-intensive industries and advanced manufacturing, which drive per employee productivity above the national average. GDP per filled job in 2025 was approximately $169,000, compared to $155,700 nationally - around 8% higher. Since 2000, Auckland's GDP per job has risen from $134,000 to $169,000, an increase of 26%. Even during economic shocks, Auckland's productivity remained resilient.

Figure 2-1: Gross Domestic Product – Auckland vs New Zealand



Looking ahead, the outlook for 2026 is cautiously optimistic, although risks such as potential trade tensions, unrest in the Middle East and the ongoing Ukraine war, may temper growth expectations. However, Auckland's scale, diversity and strategic role ensure it will continue to drive national economic

[19] Measure reported by Infometrics.

Source: Infometrics Regional Economic Monitor

performance over the long term. The region's economic resilience and sustained expansion underscore its importance as the country's leading centre for population investment and economic activity.

2.3 Infrastructure Investment

Depending on the source consulted, estimates of the infrastructure gap vary. However, all assessments point to the same conclusion: New Zealand faces a significant infrastructure deficit. Infrastructure New Zealand Chief Executive Nick Leggett is quoted as saying, "New Zealand faces a massive infrastructure deficit, estimated to be at least $200 billion." A report[20] for the Infrastructure Commission in 2021, estimates there is a shortfall of $104b at present, and on current investment trends, there will be an additional future shortfall of $106b in 30 years (in today's prices). Auckland is no exception, and the January 2023 flooding events highlighted infrastructure deficiencies.

Population and economic growth will require ongoing investment. Beyond this, further investment is required to address historic infrastructure backlogs and existing shortfalls. A report[21] by NZ Transport Agency Waka Kotahi highlighted 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. Together, these legacy issues and growth pressures mean that demand for infrastructure investment is expected to intensify over the short to medium term.

These pressures are acknowledged in central government policy, such as the Government Policy Statement on Land Transport (GPS-LT), which proposes a 30% increase in funding (revenue) for the National Land Transport Fund. Although the GPS-LT primarily focuses on new national projects, it clearly signals the scale of the investment challenge and highlights an increasing demand for aggregate driven by road maintenance needs. While recent changes in central government have introduced some uncertainty around the future investment pathway, there is a clear and growing push from Wellington to accelerate infrastructure delivery.

The Government's Going for Growth agenda and Budget 2025 commitments signal a strong intent to lift productivity and economic resilience through infrastructure investment. Over $6.8 billion in capital spending has been allocated for critical projects, including hospital upgrades, new classrooms, rail maintenance and regional flood protection schemes. This is complemented by the $1.2 billion Regional Infrastructure Fund, which prioritises climate resilience and regional economic development. Reforms to the Resource Management Act are currently underway.

The Resource Management (Consenting and Other System Changes) Amendment Act 2025 was passed into law in August 2025 and introduced a package of targeted reforms to the Resource Management Act 1991. These changes are intended as short- to medium-term improvements while the Government progresses its full replacement of the RMA. Its main aims are to speed up consenting, reduce regulatory barriers, encourage infrastructure and energy development and support housing growth. The introduction of the Fast Track Approvals Act (2024) is also part of the reform programme and

[20] Sense Partners. (2021). New Zealand's infrastructure challenge: Quantifying the gap and path to close it | Te Waihanga

[21] https://www.nzta.govt.nz/assets/resources/research/reports/693/693-aggregate-supply-and-demand-in-new-zealand.pdf

specifically aimed at streamlining consenting processes for infrastructure and development projects with significant regional and national benefits.

At the same time, Government is working on a 30-year National Infrastructure Plan through the Infrastructure Commission Te Waihanga, to provide long-term certainty for investors and councils. The draft plan has been released and sets out how infrastructure challenges can be addressed. One of the key components is developing the National Infrastructure Pipeline. Government has also indicated a shift from a three-year to a ten-year National Land Transport Programme (NLTP) to provide greater certainty for local authorities and to better plan for short- medium-, and long-term infrastructure pressures.

In Auckland specifically, several large-scale infrastructure projects will generate considerable demand for aggregate. The National Construction Pipeline report[22] (Ministry of Business, Innovation and Employment, 2024) shows, Auckland remains New Zealand's largest construction market, accounting for 38% of total national construction value and over 41% of new dwelling consents in 2023. By 2029, 42.6% of the building consents in the forecast period[23] are expected to be in Auckland. Total construction activity grew 2.3% to $23.1 billion in 2023, with a short-term decline expected through 2024-2025 before gradually rising to $24.2 billion by 2029 (a 4.2% increase from 2023). Infrastructure and non-residential building activity are expected to remain steady, with infrastructure investment strengthening toward the end of the forecast period.

Much of the infrastructure spending is dependent on aggregate. While roading takes up more than half of total aggregate (65%), its uses span an array of sectors, such as improving and maintaining water systems or park infrastructure. According to the Infrastructure Commission's Infrastructure Pipeline[24], there are several large[25] projects planned[26] across Auckland. Examples of funded (or funding sources confirmed) projects include:

- NZ Transport Agency Waka Kotahi
    - Te Ara Hauauru - Northwest Busway Stage 1 and 2
    - RoRS SH22 (Drury) Corridor Upgrade
    - RoRS Waihoehoe Road (Drury) Upgrade
    - RoNS NW Alternative State Highway (SH16)27
    - RoNS East West Link – linking SH20 and SH1 north of the Mangere inlet
    - RoNS Mill Road, South Auckland
- Watercare
    - Upgrade of Hingaia Wastewater Pump Station – Southern Auckland
    - Whenuapai & Redhill Wastewater Scheme – Package 2

[22] National Construction Pipeline Report 2024

[23] 2024-2029

[24] The Pipeline | Te Waihanga

[25] Expected cost range of $100 million+

[26] In early planning, planning or procurement stage.

[27] Four lane State highway between Brigham Creek and Fosters Road Huapai, Interchanges at Brigham Creek and Tawa Road and separated cycleway facilities.

- Upgrades of Separation and Wastewater Pipes to Reduce Wet Weather Overflows - Herne Bay
- New North Harbour Number Two Watermain
- Rosedale Sludge Conditioning

- Health New Zealand
  - New Specialised Rehabilitation Centre, Manukau Health Park
  - Facilities infrastructure remediation programme – Tranche 1 and 2
- Ministry of Education
  - 24 projects ranging from new schools and expansion work in response to roll growth, valued around $120 million.
- Auckland Transport
  - Northwestern Busway, including new bus interchanges at Te Atatu Road, Lincoln Road and Westgate.
  - Carrington Road corridor.
  - Decarbonisation of the Ferry Fleet Stage 1.
  - Low emission ferry programme – landside infrastructure.

Other high-profile projects which are underway include:

- RORS O Mahurangi Penlink: construction of the 7km transport connection between the Whangaparāoa Peninsula and SH1 at Redvale is underway. It includes new local road connections, a separated shared path between Whangaparāoa Road and East Coast Road, on- and off-ramps connecting with SH1 and a bridge crossing the Wēiti River. These works are estimated to be completed in 2028 and will cost around $830 million.
- Auckland Airport: The airport is a crucial component of New Zealand's domestic and international economy. Pre-COVID, 62% of domestic passengers and 75% of international arrivals passed through it. Numerous projects are underway to improve the facilities, amounting to a $3.9bn redevelopment programme over six years. The project includes replacing the 57-year-old domestic terminal at an estimated cost of $2.2 billion, and includes airfield renovations, integrated baggage systems and enhanced connections between domestic and international services.

  Further, preliminary work is already well underway in preparation for pavement upgrades to take place on the runway. By about 2030 Auckland Airport needs to replace concrete slabs across the main areas of the runway and nearby taxiways. A suite of projects is underway across the airfield to prepare for the runway closure, with the airport team progressively upgrading an alternative runway and widening a nearby taxiway.
- Eastern Busway: Work continues through to 2027 including construction of busway from Pakuranga to Botany, new intersections and lanes on Ti Rakau Drive, new road connections and bridges. The total cost is reported to be in the order of $1.6 billion over nine years. Some of the initial stages have been completed.
- Papakura ki Pukekura (SH1 Papakura to Bombay): The project is part of a longer-term strategic transport network being investigated and delivered to support growth in South Auckland. Stage 1 (Papakura to Drury) comprises of 1A which was completed in August 2024 and 1B currently under construction. According to NZTA Waka Kotahi, the estimated cost of Stage 1B is around

$495 million over six years (2024-2030). Stage 1 will deliver 4.5km of new motorway lanes in each direction, 4km of pathways for walking and cycling and interchange improvements at Papakura and Drury.

- Precinct Properties:
    - 22 Stanley Street, Parnell: $290m, 960 units student accommodation, under construction, due to open 2028.
    - 256 Queen Street: $201m, 680 units student accommodation, construction starts November 2025.

  According to their Annual Report (2025), the value of committed projects is currently $1 billion
  and Precinct has a pipeline of over $3.7 billion including Downtown Car Park in various stages of planning, procurement and construction.

Auckland Council plans to spend $295 billion[28] on infrastructure over the next 30 years, upgrading, replacing and building new infrastructure across the region, according to its infrastructure strategy. This implies an average of $9.83 billion being spent per year, on infrastructure.

Appendix 2 shows key infrastructure growth projects planned for over the next 10 years. With respect to Clevedon Quarry, the most important are those in East, South and Rural South Auckland, because of its proximity to these significant works. Projects span various categories such as transport, 3 waters, community facilities and so on.

As previously mentioned, south and east Auckland is expected to account for 41% of Auckland's population growth over the next 30 years. StatsNZ has not yet released updated household projections, but according to Auckland Council's Housing and Business Capacity Assessment (HBA), approximately 197,120 dwellings are required over the long term (next 30 years)[29] under a medium growth scenario. Considering the strong link to population, this would suggest nearly 81,000 of these would be required in the southern and eastern parts of Auckland. On average, each dwelling requires around 250 tonnes of aggregate[30] along with local roads and other infrastructure, suggesting demand for aggregate will remain high.

2.4 Auckland's Aggregate Market

Aggregate supply has limited ability to expand in response to sudden increases in demand. Auckland faces a well-documented shortfall in local aggregate supply, meaning demand often exceeds what can be produced locally. As a result, aggregate must be imported from other regions, increasing costs for both purchasers and society more broadly. 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 expansions of regional significance[31]. This has further intensified the regional shortage. The

[28] Some of these projects are included in the Infrastructure Pipeline's list of projects.

[29] https://www.knowledgeauckland.org.nz/publications/housing-and-business-development-capacity-assessment-for-the-auckland-region-national-policy-statement-on-urban-development-2020/

[30] The Aggregate & Quarry Association of NZ, Fact Files | Aggregate & Quarry Association.

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

report estimated Auckland's aggregate deficit at around 4.5 million tonnes per annum[32], requiring higher-cost imports to meet demand. The Infrastructure Commission estimates Auckland produced around 10.5 million tonnes[33] of aggregate in 2019. This is similar to adjusted supply levels derived from our modelling, averaging 10 million tonnes over the past decade.

We note that Brookby Quarry was recently granted resource consent under the COVID-19 Recovery (Fast-track Consenting) Act 2020, to expand its operation, doubling its annual production to 5.7 million tonnes[34]. However, part of this output is allocated to manufactured sand, with the company's marketing material stating that 300,000 tonnes is currently available, and that production could increase to 600,000 tonnes if sufficient demand emerges and the market supports the expansion.[35] The 300,000 tonnes value is removed from the aggregate supply, assuming there is no wastage and a 1:1 conversion ratio from input to available manufactured sand. This suggests Brookby can contribute an additional 2.55m tonnes of aggregate to the market annually.

The Government named eight quarry projects on its Fast-track list, four[36] of which are in Auckland, and all of them are expansions of existing quarries. Two of the applications have been approved (Sutton Block and Kings Quarry - Stage 2) but the specifics about status and timing of the remaining applications are uncertain. Table 2-2 presents an overview of the FTAA quarrying projects.

Table 2-2: Listed quarrying projects in Auckland under Fast Track Approvals Act (2024)

Project Name	Description	Status
Drury Quarry Expansion – Sutton Block	In stages, develop a quarry with a maximum pit depth of 60 metres over a 50-year period, to be serviced using existing infrastructure and facilities.	Approved
Flat Top Quarry Development	Expand the existing quarry to enable the extraction of approximately 9.2 million cubic metres of rock resource.	Listed
Hunua Quarry Development	Expand the existing quarry to increase annual quarry production to approximately 5.4 million tonnes of aggregate, and to enable the extraction of aggregate for a further 80 years.	Listed
Kings Quarry Expansion – Stages 2 and 3	Expand existing quarrying activities to enable the extraction and processing of up to approximately 500,000 tonnes per annum for up to 100 years (combined).	Stage 2: Approved Stage 3: Listed

Source: fasttrack.govt.nz

A 2020 online survey[37] conducted by NZTA Waka Kotahi, involving 89 industry participants nationally (including 13 from Auckland), sought to understand the views of key and representative groups within the industry. Nearly all Auckland respondents agreed that supply issues existed, with over half

[32] 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.

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

[34] Appendix-21-Assessment-of-Economic-Effects.pdf

[35] Based on information published by Brookby Quarries.

[36] Kings Quarry although listed as one project, has two stages which are assessed separately.

[37] https://www.nzta.govt.nz/assets/resources/research/reports/693/693-aggregate-supply-and-demand-in-new-zealand.pdf

identifying them as major. Although regional results were not reported separately, the national responses reflected widely reported industry concerns. These included:

- difficulties in sourcing the right type of aggregate near demand centres,
- a challenging consenting process,
- limited forward planning, and
- competition for available material.

The responses underscore the need to increase supply as well as futureproof current supply, particularly close to areas of demand.

Expanding aggregate supply is further constrained by several challenges within the current operating environment:

- Significant lead times are required to procure equipment, either to replace existing or obtain new ones, with delays of 12 to 24 months for some machinery.
- A tight labour market and shortage of appropriately skilled workers make recruiting new staff or replacing staff challenging.
- Energy grid constraints can make it difficult or infeasible to secure sufficient energy supply for operations.

These factors add complexity to production and limit the ability of suppliers to respond to changing demand, thereby deepening Auckland's supply shortfall. Furthermore, evolving policy settings - particularly the increasing emphasis on environmental protection - pose additional barriers to growth and long-term supply security. These changes to the policy landscape contribute to uncertainty for operators (quarry owners) making it more difficult to plan for the future.

2.5 Concluding Remarks

Aggregate supply has a key role in the economy. Continued investment in infrastructure, which is driven by housing demand, the need to address damage from severe weather events and broader economic growth, relies on sustainable access to quality aggregate that is located near where it is needed. Supply constraints and resulting price effects can significantly influence the viability of infrastructure projects.

Auckland's future growth pattern is expected to align with its existing urban structure, with intensified housing and economic activity concentrated around established centres and business areas. This growth will require well-planned infrastructure to ensure the city continues to function efficiently. In this context, enabling the Clevedon Quarry to continue operating will play an important role in supporting Auckland's growth in the eastern and southern areas, reducing cost associated with imported (out of region) aggregate.

3 Aggregate Use

Beyond its physical uses, aggregate contributes to the New Zealand's wider economy by enabling development. Roads, bridges, buildings and utilities all rely on a steady supply of aggregate, and these assets in turn support business activity, housing growth and regional connectivity. New Zealand's terrain and extensive infrastructure network mean demand for aggregate is high, making it a strategic resource for the country's long-term development.

Roughly two thirds of New Zealand's aggregate is used in roading, where it forms the foundation of pavements and road surfaces through basecourse layers, sealing chips and stabilisation materials that influence pavement strength, durability and long-term performance. The remainder supports construction and civil works, including concrete manufacturing, where specific aggregate types and gradings are essential for strength and workability, as well as site preparation, foundations, drainage layers and engineered fill for land development. Aggregate also plays an important role in specialised applications such as coastal protection, rockfill in large civil projects and stone products used in landscaping and urban design. This section provides an overview of historical aggregate production and consumption patterns, focussing on Northland, Auckland and Waikato. The latter half of the section then assesses future demand under two alternative growth scenarios.

3.1 New Zealand Aggregate Production

New Zealand Petroleum and Minerals (NZP&M) is the government regulator responsible for managing the Crown minerals estate, administering the Crown Minerals Act (CMA) 1991. It operates as part of the Ministry of Business, Innovation and Employment (MBIE).

The annual aggregate production survey by NZP&M collects data on the output of aggregates and industrial minerals to support infrastructure planning and resource management. Covering production trends from 1993 to the present[38] (2023), it faces challenges such as variable response rates, especially from privately owned quarries, which can affect data completeness. In 2023, the response rate for the complete survey was 63%, up from 38% in 2022 and 54% in 2021. However, responses have been down from an average of about 76% between 2012 and 2020. Despite these hurdles, the survey provides valuable insights into regional supply, economic contributions and long-term trends, helping government and industry make informed decisions for sustainable development.

The survey also reports on aggregate production by usage and region, enabling a spatial overview of relevant mineral commodities. A review of detailed data for the areas of interest indicates relatively little year-to-year variation at the regional level. This consistency suggests that the 2023 dataset captures the key patterns needed for analysis and provides a sufficiently robust basis for this assessment, particularly in relation to distribution.

For this report, we focus on aggregate as encompassing:

[38] This was the most up to date information at the time of writing. The 2024 survey results were released at the end of 2025 but does not change the conclusions reached in this report.

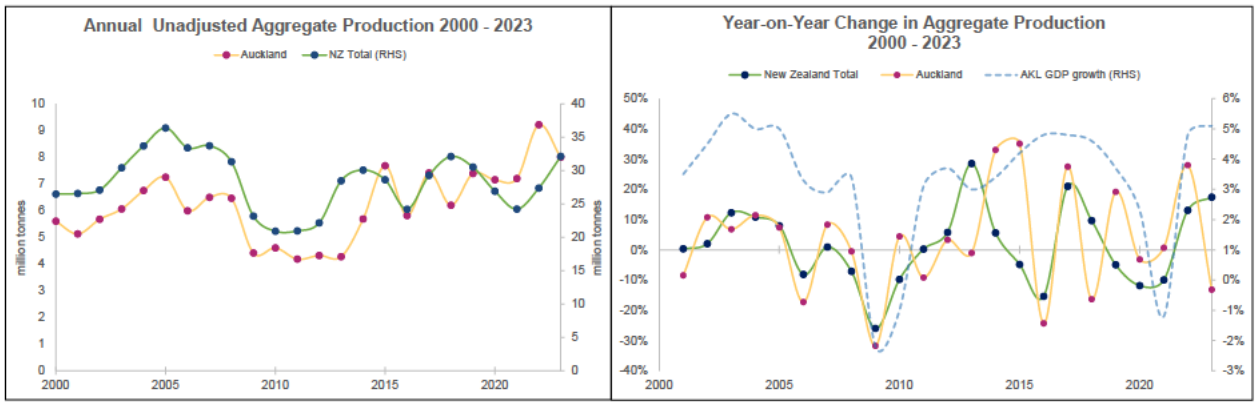
a. rock for reclamation and protection,
b. rock, sand and gravel for building, and
c. rock, sand and gravel for roading.

These categories are established at a 'purpose' level and are not reported in a more finely disaggregated manner, such as at the commodity level. Nonetheless, the data generally aligns well with the aggregate products of Clevedon Quarry. Certain categories have been omitted from our analysis due to their limited compatibility with Clevedon Quarry's aggregate utilisation.

Importantly, this is a voluntary survey, meaning the accuracy of the findings depends on the responses submitted to NZP&M. Further, the extent to which statistics are accurate is subject to how representative the responses are of the entire industry. We note that other industry sources suggest that the NZP&M survey may be underestimating total production. For example, comprehensive data collected by Fulton Hogan on Auckland's aggregate market, in 2019 suggests production figures could be understated by up to 28%. A review of NZP&M data shows that non-responders are fairly evenly spread across regions, so we've applied Auckland's adjustment index to other regions to scale the data. While the response rate dropped sharply in 2022, it's worth noting that most regions still showed volume changes within normal year-on-year patterns.

Figure 3-1 shows aggregate production across New Zealand and Auckland for the past two decades based on the NZP&M data. Importantly, Auckland data represents production volumes, not the volumes used locally. This means that imported aggregate volumes are not reflected in the figure.

Figure 3-1: Aggregate Production (2000-2023)



Aggregate production in both Auckland and across New Zealand has fluctuated notably over the past two decades, broadly following economic cycles. Between 2000 and 2007, production increased steadily, peaking before the Global Financial Crisis. Output dropped sharply between 2008 and 2010, before recovering in 2014 and 2015. This period coincided with a strong economy, referred to at the time as the 'rockstar economy', growing at an approximate annual rate of 4%. Key initiatives and infrastructure projects that contributed to the growth include:

- Christchurch rebuild in the aftermath of earthquakes
- Transmission Gully,
- Puhoi to Warkworth motorway,
- City Rail Link, and
- International Convention Centre in Auckland.

A period of moderate growth interspersed with short downturns followed, likely reflecting shifts in construction demand and infrastructure activity. The sharp increase in 2021 and 2022 reflects the post-COVID recovery in construction and infrastructure projects, and the housing market upturn. This has since slowed somewhat.

Aggregate production trends in Auckland largely mirror the national production profile. Based on unadjusted NZP&M survey data, Auckland has historically accounted for around 22% of national aggregate production and therefore has a noticeable influence on the national data.

Year-on-year change data highlight these cycles more clearly. Both Auckland and national production show periods of strong expansion - often exceeding 10% annual growth - followed by rapid contractions. When compared with Auckland's GDP growth, aggregate production shows a much higher degree of variability, indicating that aggregate demand is more sensitive to changes in construction activity than to broader economic trends.

While Auckland is New Zealand's largest centre, accounting for on average 38% of national GDP, it only accounts for around a quarter of total aggregate production in most years. In 2023, Auckland produced 8.0 million tonnes of aggregate, while total New Zealand production was reported at 32.1 million tonnes.[39] Table 3-1 presents the unadjusted aggregate production volumes across Auckland, Waikato, and Northland between 2013 and 2023.

Table 3-1: Unadjusted New Zealand Aggregate Production (million tonnes) 2013-2023

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Auckland	4.3	5.7	7.7	5.8	7.4	6.2	7.4	7.2	7.2	9.2	8.0
Waikato	5.6	4.5	5.4	4.1	5.7	8.2	5.1	6.3	6.2	6.0	7.1
Northland	1.8	1.7	1.6	0.7	1.4	0.9	0.8	1.1	1.0	0.8	1.4
Total New Zealand	28.5	30.1	28.6	24.2	29.3	32.1	30.5	26.9	24.2	27.4	32.1

As previously pointed out, Auckland's production has fluctuated over the past decade, rising sharply in 2015 and again in 2022 before coming back slightly in 2023. The spike in 2022 is likely due to pent-up demand and the strong post-COVID construction activity. Waikato's output shows a similar cyclical pattern, at times exceeding Auckland's (notably 2013 and 2018). Northland's production remains relatively low and stable throughout the period, contributing a small share to the upper North Island total. The figures confirm Auckland's reliance on imported aggregate from nearby regions, reflecting the region's high demand and limited local supply capacity.

Importantly, the NZP&M survey is voluntary and relatively low response rates suggest that production volumes being reported understate the true level of aggregate production. Table 3.2 presents the adjusted production estimates designed to more accurately reflect actual output.

[39] Note that supplying production information to MBIE (NZ Petroleum and Minerals) by quarries is voluntary. This means there is an amount of under reporting and fluctuations in the production numbers.

Table 3-2: Adjusted New Zealand Aggregate Production (million tonnes) 2013-2023

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Auckland	6.0	7.9	10.7	8.1	10.3	8.7	10.3	10.0	10.1	12.9	11.2
Waikato	7.8	6.3	7.5	5.7	7.9	11.5	7.2	8.8	8.6	8.4	10.0
Northland	2.4	2.4	2.3	1.0	2.0	1.2	1.1	1.5	1.3	1.1	2.0
Total New Zealand	39.8	41.1	39.7	33.4	40.5	44.5	42.2	36.5	31.3	36.7	44.2

The adjustment is based on a full and comprehensive survey carried out by Fulton Hogan on Auckland's aggregate production volumes and verified by other major operators. These adjusted figures show Auckland's 2023 production increasing from 8.0 to 11.2 million tonnes.

Applying similar adjustment factors to other regions increases total New Zealand aggregate production to 44.2 million tonnes in 2023 - considerably higher than the unadjusted 32.1 million tonnes. Auckland remains the leading regional producer, aligning with its economic scale, construction activity and infrastructure demand.

More recently (2019-2023), Auckland's adjusted production has averaged 10.9 million tonnes annually, with relatively limited variation from year to year. This stability reflects an equilibrium between new quarry consents and the gradual depletion of existing ones. Over the past 10 years Auckland has produced on average, 10.0 million tonnes of aggregate, annually. The future supply of aggregate in Auckland is assumed to remain constant at current levels observed during the past five years (2019-2023).

Crucially, aggregate production is dependent on the consents and consent conditions, and these can expire. The gap between the consented volumes, current production levels and expiry dates are unknown. Therefore, recent production levels are used to illustrate the quantum of the shift, relative to current volumes.

3.2 Historic Ratios

This section draws on the latest population estimates from Stats NZ and combines them with aggregate production data from the previous section, to derive a per-capita use ratio. Establishing this ratio provides a useful basis for modelling future demand scenarios and can help assess the extent to which regions are self-sufficient in meeting their aggregate needs or rely on imports from neighbouring areas.

Table 3-3 presents the estimated resident population for Auckland, Waikato, Northland and New Zealand between 2013 and 2023, according to StatsNZ.

Table 3-3: Annual Population Estimates, 2013-2023

	2013	2015	2017	2019	2021	2023
Auckland	1,493,200	1,552,800	1,625,100	1,681,300	1,704,100	1,753,700
Waikato	424,600	442,100	465,000	485,700	508,400	524,800
Northland	164,700	172,100	181,200	189,100	198,900	202,200
Total New Zealand	4,442,100	4,609,400	4,813,600	4,979,200	5,111,400	5,245,000

Over this ten-year period, Auckland's population increased steadily from 1.49 million to 1.75 million, reflecting its role as the country's principal centre for population and employment growth (in absolute terms). Waikato and Northland also recorded consistent gains, rising by approximately 100,000 and 40,000 people, respectively over this period. Nationally, New Zealand's population grew from 4.44 million in 2013 to 5.25 million in 2023. The 2023 data show Auckland's population rebounding strongly after the COVID-related dip in 2021 and 2022, increasing by around 3.5% compared with 2.4% nationally. This sharp recovery was driven largely by record levels of net migration, which have since moderated. Whether this elevated growth rate will continue remains uncertain. Various factors including migration patterns and economic conditions will influence population growth in Auckland going forward.

Table 3-4 shows the average aggregate production levels per capita for the upper north island over the past decade (2013-2023).

Table 3-4: Average Aggregate Production per capita, 2013-2023

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Auckland	4.0	5.2	6.9	5.1	6.4	5.2	6.1	5.8	5.9	7.6	6.4
Waikato	18.4	14.7	17.0	12.7	17.1	24.2	14.7	17.6	17.0	16.3	19.0
Northland	14.9	14.3	13.3	5.7	11.0	6.6	6.0	7.9	6.7	5.7	9.7
Total New Zealand	9.0	9.1	8.6	7.1	8.4	9.1	8.5	7.2	6.1	7.2	8.4

Over the past decade, Auckland's aggregate production per capita has fluctuated, ranging from 4.0 tonnes per capita in 2013 to a high of 7.6 tonnes in 2022. Despite some year-to-year variation, the long-term[40] average of 5.9 tonnes per capita remains well below the national average of 8.8 tonnes and significantly below the Waikato's average of 17.7 tonnes per capita.

The Waikato has consistently demonstrated a high level of production relative to its population, reflecting its role as a key source of aggregate supply for neighbouring regions. This excess capacity allows the region to export aggregate to areas with limited internal supply, particularly Auckland and the Bay of Plenty. In contrast, Auckland's lower per-capita production indicates a reliance on imports to meet construction and infrastructure demand. Northland's production ratios have varied more markedly, decreasing over time, with noticeable dips in 2016 and 2022. This likely aligns with the timing of major infrastructure projects and production adjustments across the region.

It is important to interpret these ratios within a broader economic and temporal context. Annual figures can be influenced by localised infrastructure projects, resource availability and one-off events such as

[40] 2000 to 2023.

COVID-19 lockdowns or Christchurch earthquakes, which temporarily affected production and demand cycles. Consequently, forward-looking assessments should not rely solely on data from a single year but rather consider a longer timeframe.

The comparison across regions underscores a structural pattern: Auckland remains a net importer of aggregate due to high construction demand and limited local quarry capacity, while the Waikato acts as a regional supplier. Given that aggregate is a high-volume, low-value commodity with high transport costs, maintaining proximity between production and consumption is critical for efficiency and sustainability.

Table 3-5 presents the median and average ratios over the past decade and long-term (2000-2023) for these three regions.

Table 3-5: Aggregate Production per capita (tonnes per capita)

	2000-2023		2013-2023	
	Average	Median	Average	Median
Auckland	5.9	6.1	4.2	2.9
Waikato	17.7	17.2	12.6	9.7
Northland	15.5	14.6	11.1	4.1
Total New Zealand	8.8	8.8	6.4	4.8

Over the longer term, Waikato and Northland both show substantially higher average and median ratios than Auckland as well as New Zealand as a whole. Although all regions show lower ratios over the most recent decade (2013-2023), the same pattern remains. This indicates that while aggregate production per capita has generally reduced over time, Auckland continues to operate at a lower per capita level than the other regions and New Zealand overall.

3.3 Demand Outlook

To understand the potential future role that an expansion of the Quarry will play in the region, it is important to understand the range within which future aggregate demand will sit. To this end, we have developed two scenarios to reflect different population growth expectations and therefore different futures for aggregate demand.

The link between population and economic growth is well documented, and similarly, the link between economic growth and aggregate demand is acknowledged. Population growth is therefore used as the main driver of aggregate demand when designing the scenarios. The assessment presents a medium and high growth scenario which reflect StatsNZ medium and high population projections[41]. Several other scenarios were also modelled and appraised to understand the wider spread, but these are not reported.

[41] Subnational population projections, by age and sex, 2023(base)-2053. Released 25 September 2025. Statistics New Zealand.

Table 3-6 shows the total aggregate demand estimates for the Auckland region under the different scenarios. Demand under scenario 1 is underpinned by medium population growth projections and scenario 2, by high growth projections.

Table 3-6: Auckland Aggregate Demand Forecasts by scenario (million tonnes)

Auckland	2025	2030	2035	2040	2045	2055	% change 2025 -2055	CAGR
Scenario 1	16.2	17.2	18.3	19.3	20.3	22.2	37%	1.0%
Scenario 2	16.3	17.8	19.2	20.6	22.1	24.9	52%	1.4%

Based on the modelling results, aggregate demand is projected to grow from its estimated current (2025) level of 16.2 million tonnes to 22.2 million tonnes by 2055 under Scenario 1, equal to a 37% increase, or a 1.0% annual compound growth rate. For scenario 2, the higher growth assumptions mean that the future demand is estimated to increase to around 24.9 million tonnes by 2055. This equates to a 38% lift over the period, and compound annual growth rate of 1.4% per annum. These figures represent the anticipated demand range going forward. While there could be short periods where growth is above or below these estimates it would be inappropriate to base medium- or long-term decision making on such short-term fluctuations. Therefore, the above range is seen as appropriate for the purpose of this assessment.

3.4 Regional Self-sufficiency

This section identifies the output gap in Auckland's aggregate market. The output gap is estimated by subtracting Auckland's supply capacity from projected demand. A negative result indicates that demand exceeds production capacity within the region. This provides a net surplus or deficit position over time. Auckland already relies on importing aggregate from other regions, with sources often located some distance from the destination. Increasing the proportion of supply sourced from outside of the region would therefore be expected to increase associated costs.

The output gap highlights how the difference between demand and supply widens over time if supply remains fixed (i.e. no new quarries or additional extraction capacity are consented). This section presents the expected output gap across time over the next 30 years.

Table 3-7 presents the indicative outlook by comparing demand in Auckland under a medium population growth track, with potential supply outcomes based on two supply scenarios. Appendix 3 contains further detail about the output gap under a high growth demand scenario. The two supply scenarios reflect a 'best case' and 'worst case' from a supply perspective and are based on the following assumptions:

1. 'Best case' scenario – annual supply is estimated be around 17.2 million tonnes, increasing to 21.3 million tonnes from 2030 onwards. The annual supply is made up of:
    - Historic maximum[42] 12.9MT
    - Recently consented capacity:
        - Brookby Quarry 2.55MT

[42] 2022 production level.

        - Sutton Block 1.3MT
        - Kings Quarry Stage 2 0.5MT
    - Listed projects[43]:
        - Hunua Quarry 2.6MT
        - Flat Rock Quarry 1.0MT
        - Kings Quarry Stage 3 0.5MT
2. Under the 'Worst case' scenario annual supply is estimated around 14.4 million tonnes. Supply is made up of:
    - Most recent 10-year[44] average 10.0MT
    - Recently consented capacity:
        - Brookby Quarry 2.55MT
        - Sutton Block 1.3MT
        - Kings Quarry Stage 2 0.5MT

Table 3-7: Auckland Projected Output Gap (2025-2055) – Medium Population Growth

	2025	2030	2035	2040	2045	2050	2055
	Medium Population Growth						
Aggregate Demand	16.2	17.2	18.3	19.3	20.3	21.2	22.2
Surplus/Deficit under **Best case supply**	1.0	4.1	3.0	2.0	1.0	0.1	-0.9
Surplus/Deficit under **Worst case supply**	-1.9	-2.9	-3.9	-4.9	-5.9	-6.9	-7.8

Across all supply and demand combinations (Appendix 3), locally sourced aggregate is insufficient to meet Auckland's requirements. Even the most optimistic supply case (based on recent high output, new and potential capacity) indicates a persistent and growing output gap. This demonstrates that Auckland's reliance on external sources of aggregate will increase over time unless substantial new supply capacity is enabled within the region.

Key observations:

- Under the best case supply scenario, Auckland experiences a surplus over the short and medium term, peaking at approximately 4.1 million tonnes per annum in 2030. However, this surplus declines thereafter, with the market returning to deficit by 2055 (around 0.9 million tonnes per annum). This suggests that even under favourable conditions, supply does not keep pace with long-term demand growth.
- Over time, the output gap widens, reflecting the impact of continued demand growth outstripping relatively fixed supply capacity. This highlights the importance of both maintaining existing operations and enabling new supply sources over time.

[43] Importantly, uncertainty remains about the contribution of the listed projects to annual supply, given the limited publicly available information.

[44] 2013 to 2023

- Under the worst case supply scenario, Auckland faces an immediate shortfall of approximately 1.9 million tonnes per annum. This deficit increases consistently over time, reaching around 7.8 million tonnes per annum by 2055.
- The widening gap under the worst case scenario reflects the risk that, if additional planned projects are not realised, the region will become increasingly reliant on external sources of aggregate.
- The comparison between scenarios demonstrates that while additional projects can delay the onset of supply constraints, they do not fully offset long-term demand pressures. As a result, the market remains structurally constrained over the longer term.

It must be noted that the best case scenario relies on quarries maintaining relatively high levels of production in the future. Since Clevedon accounts for a portion of the current supply, it is key that the quarry continues operating. The proposed expansion of the pit will enable the Quarry to do so.

As the economy expands and demand for aggregate lifts, additional product will need to be imported from other regions to satisfy business and infrastructure needs, if no additional local capacity is added. Aggregate is a low-value, high-volume (and weight) material with cost to the consumer strongly influenced by distance. For this reason, extraction is most economical when located close to where the material is required. Therefore, regardless of additions to production in the northern parts of Auckland (Flat Top, Kings and other), growth in and around south and east Auckland - including residential and infrastructure such as roads, railways and community facilities - points to the need for additional aggregate capacity to be available closer to those areas. Ensuring ongoing supply from Clevedon Quarry would therefore support a more efficient growth pathway and reduce wider economic costs.

3.5 Concluding Remarks

Aggregates play a key role in regional economic development. Rising demand reflects growth in construction, infrastructure and employment, but also requires sufficient accessible aggregate supply to support that growth. Retaining and expanding existing extraction capacity is therefore important to ensure there is sufficient supply to support growth. If supply does not increase in line with demand, Auckland will become increasingly reliant on aggregate from other regions, imported from overseas or from recycled materials. Without the ability to respond to increased demand, supply will be constrained, increasing competition for the resource, putting upward pressure on prices for consumers.

Based on available information, production levels in 2022 in Auckland reached near parity with demand. However, this relied on a significant uplift in 2022, where Auckland supply rose by 28% from the year before, which may not be sustained. Under the medium growth demand scenario, the output gap in 2055 would require supply to increase by up to 54%[45] to meet demand.

[45] Under the worst case supply scenario where listed projects are not granted consent.

It is clear, that maintaining current levels of production is important, but not sufficient to close the output gap. Expansion enabling additional aggregate supply will also be required, to accommodate growth going forward.

Alternative supply options involve higher transport costs and greater environmental impacts due to longer distances travelled. While identifying and developing new resources within the region remains important, extending existing quarries offers the most cost-effective and potentially lowest-impact pathway. The output the Quarry produces annually needs to be retained or replaced in order to maintain the current level of supply in the Auckland market and minimise future output gaps. Given its proximity to major future housing and infrastructure delivery areas to the east and south of Auckland, the Quarry is strategically placed to supply the aggregate market. While it is not proposed that the expansion will address the projected output gap in the short term, it is key to ensure ongoing supply over the medium to long term, minimising imports and therefore additional costs.

Locating aggregate supply close to where it is consumed is financially, socially and environmentally more efficient. Moreover, for a market to operate efficiently, the supply side must be able to adapt to shifts in demand. Maintaining adequate, reliable and accessible supply is therefore critical to enabling development to proceed at expected rates and supporting wider regional economic outcomes.

The next section explains the potential economic costs and benefits associated with the Clevedon pit expansion.

4 Costs and Benefits

Having outlined the scope and scale of Auckland's aggregate market and its potential future growth and change, it is important to consider the economic effects (costs and benefits) of the proposed expansion. This section examines the contribution of Clevedon's operations to Auckland's overall wellbeing and economic resilience.

The economic costs and benefits encompass both direct impacts, such as changes in aggregate pricing, and indirect impacts, including environmental emissions and social costs. These outcomes are largely shaped by transportation related to the location of aggregate production. In addition to assessing the potential savings, i.e., avoided costs and the broader implications of these effects, the opportunity cost of the expansion is also explored.

In assessing the benefits of sourcing aggregate from the Clevedon Quarry, this analysis compares the potential outcomes of this option against alternative supply sources. The primary alternatives considered are quarries located in Waikato and Northland. Other Auckland quarries are unlikely to meet market demand in the short term due to capacity constraints, expansion constraints or differences in material quality (or type). Consequently, Waikato and Northland serve as the main points of comparison.

Clevedon's proximity to Auckland offers a significant advantage, reducing transportation-related economic costs relative to more distant sources. The approval of the Clevedon consent would prolong the operational life of the site, increasing the total volume of aggregate available to the market over the next fifty years. Without this consent, Auckland's shortfall would become more acute, with Clevedon's current annual contribution coming to an end within the next 27 or so years. This suggests additional aggregate would need to be sourced from quarries located further away to fill the gap - unless new local sites can be established. Setting up new quarries and commencing production would involve substantial setup costs, which would likely be reflected in higher aggregate prices.

Granting the consent application would help Auckland mitigate the risk of a growing aggregate supply deficit and avoid these additional costs. In this assessment, such avoided costs are treated as benefits. It should be noted that equilibrium effects, e.g., how the market price of aggregate might be affected or how other quarries might respond to changes in competition, are not quantified. However, it is widely recognised that price increases driven by material shortages represent a suboptimal outcome.

4.1 Costs and Benefits – Assumptions

Transporting aggregate, like other freight activities, carries both the immediate costs of transport and the associated environmental and social costs that occur as a result. This section examines the costs and benefits associated with the expansion of the Clevedon Quarry, enabling its continued operation. These are assessed by comparing the situation with the expansion against the alternatives without the expansion. It is assumed that if the consent is not granted, that the quarry would cease to operate beyond 2053.

In our analysis, we rely on Clevedon Quarry's input about delivery destinations (current and future) to determine the spatial distribution of increased aggregate output. These patterns are, to a large extent, dictated by construction projects located around the southern parts of Auckland region.

It is important to note that these destinations represent broader market areas rather than single delivery points. For example, "East Tamaki" reflects demand across the wider eastern suburbs, including Beachlands, Maraetai, and Kawakawa Bay, rather than one specific location. Based on input from SAL, we estimate the share of aggregate ending up in each of the following locations are as follows:

- East Tamaki 10%
- Penrose 10%
- Papakura 40%
- Drury 40%

If consent is not granted for Clevedon to expand, Auckland would need to fill the gap by sourcing aggregate from further afield after 2053, when the current consent expires. This reflects a 'do nothing' scenario. To estimate the cost under this scenario, two out of region quarries have been selected as indicative alternative sources - Smythes Quarry in Waikato and Maungaturoto in Northland. Both produce greywacke similar to Clevedon. However, we have not attempted to establish whether these quarries would be able to individually or collectively increase production to replace Clevedon's potential supply. There are known limiting factors that might prevent these quarries from being able to meet the shortfall. This includes energy related constraints and the emergence of a preferred route for the Northland Corridor threatening the future of Maungaturoto quarry. Accordingly, Smythes and Maungaturoto are used solely as reference examples to illustrate scale and direction of effect. In the absence of Clevedon, it is probable that aggregate would need to be transported from even further afield. These Waikato (northern) and Northland (southern) examples therefore demonstrate the types of distances that may be required if supply shifted to neighbouring regions. Of the approximately 60 quarries in Northland, only one is marginally closer to Auckland than Maungaturoto, and it may not be a practicable or suitable alternative. In Waikato, of the 84 quarries, only six are closer to Auckland than Smythes, but these include sources such as Tuakau and Pukekawa, which are mainly sand suppliers. Greywacke quarries such as Mangatangi and Pokeno are already supplying the Auckland market currently. Therefore, the transport cost calculations using Smythes and Maungaturoto reflect a minimum-case ('at least') cost position, as sourcing from elsewhere would involve even longer transport distances.

Another possible option is to open a new greenfield quarry. However, expanding an existing quarry provides several advantages compared to establishing a new site. These advantages include both economic and environmental[46] factors, such as:

- Lower consenting complexity.
- Faster implementation timeframe.
- Reduced environmental disturbance footprint.
- Reduced community social impact, i.e., fewer new neighbours impacted.

[46] These are included here for completeness even though the environmental matters are normally addressed by the relevant experts. The environmental matters are not included in the assessment of costs and benefits.

- Better utilisation of existing infrastructure/sunk capital.
- More predictable supply continuity.

Based on Smythes and Maungaturoto as the indicative alternative sources, the extra transport distances for trucks carrying aggregate to the destinations being used as reference points, have been estimated. The weighted average distance incorporates the assumed share of aggregate ending up at each of the locations as previously presented. Table 4-1 sets out the distances being used in this assessment to model costs.

Table 4-1: Base values for transport distances (return journey)

	Distance (km)				
	East Tamaki	Penrose	Papakura	Drury	Weighted Ave
Clevedon Quarry	56	73	32	43	43
Smythes Quarry	137	145	105	94	108
Maungatoroto Quarry	248	234	274	282	271
	Distance relative to Clevedon Quarry				
	East Tamaki	Penrose	Papakura	Drury	Weighted Ave
Clevedon Quarry	0	0	0	0	0
Smythes Quarry	81	72	73	51	65
Maungatoroto Quarry	192	161	242	239	228

The distances shown in the table reflect a round trip to each location. The assessment assumes trucks deliver aggregate and then return to the quarry empty. This has implications for both transport costs and the emissions produced on each leg of the trip. The distance figures are then combined with truck movements to calculate the overall travel distance. The total travel distance is used to estimate costs, including transport-related costs, emissions costs and injury-related social costs. Table 4-2 outlines the key assumptions relating to vehicle movements.

Table 4-2: Core Transport Assumptions

	Core Input
Truck Size (t)	23
Volume assessed (t)	330,000
Truck loads	14,350

The truck size in this analysis is associated with the weight of aggregate carried in each load, and according to SAL, this is on average, 23 tonnes. The annual volume assessed was set at 330,000 tonnes, which is based on recent production levels. Based on these core assumptions, it is estimated that the annual production of 330,000 would result in around 14,350 loaded journeys. As part of the analysis, we have also assessed what the benefits (avoided costs) would be if the Quarry extracted its consented limit of 3 million tonnes per annum. This suggests a potential of 130,440 loaded truck movements per annum. The costs related to transport, social, and environmental factors are calculated based on the delivery of these loads to the specified reference locations.

Transport cost assumptions are based on information provided by SAL, noting that these costs are incorporated into the final price of aggregate paid by the end consumer. The relevant transport rates

are $12.50 per tonne plus $5 per km. On this basis, the indicative cost of transporting a full 23-tonne truckload of aggregate from the SAL Clevedon quarry to the selected destinations are:

- East Tamaki $430
- Penrose $470
- Papakura $370
- Drury $400

The weighted average distance travelled by aggregate from Clevedon is 22km which suggests travel cost of $395 per truck load. Using the same inputs, the weighted average distance from Smythes is 54km, equating to $560 per truck load, and from Maungaturoto is 135km, i.e., $965 per truck load.

Using these inputs and assumptions, transport, environmental and social costs of transporting aggregate, are estimated. The approach followed in each of these aspects is summarised below.

4.1.1 Transport Costs

The data underpinning this analysis was provided as end user aggregate prices per tonne and per kilometre. The assessment combines distance (to aggregate destinations) and weight (per truck load) with the relevant per unit rates to estimate the total costs. The difference between annual transport costs associated with sourcing aggregate from Clevedon Quarry, relative to the cost of sourcing aggregate from Smythes or Maungaturoto, shows the additional costs to the customer.

The extent to which the additional cost of sourcing aggregate from alternative locations (rather than Clevedon) is passed on to end users will depend on the fraction of the transport costs absorbed by the supplier and intermediaries. When demand materially exceeds available supply and demand is relatively inelastic, a larger share of the cost increase is expected to be passed on to consumers. In a market like Auckland, where supply constraints already exist, the level of cost pass-through is anticipated to be high.

4.1.2 Emissions Costs

Aggregate transport by road generates pollution (emissions) that have adverse environmental and health impacts. These impacts can be expressed in monetary terms using established government guidance. For this analysis, the following sources were consulted:

- Waka Kotahi NZTA Vehicle Emissions Prediction Model (VEPM v7.1)[47]
- Monetised Benefits and Costs Manual (v1.7.4, August 2025)[48]

[47] Accessed: 11/11/2025 from https://www.vepm.co.nz/

[48] Table 9 (p.62) source: Kuschel et al. (2022). Health and air pollution in New Zealand 2016 (HAPINZ 3.0): Volume 1 – Findings and implications. Report prepared for Ministry for the Environment, Ministry of Health, Te Manatū Waka Ministry of Transport and Waka Kotahi NZ Transport Agency, March 2022.

This section presents the cost parameters used in the modelling to estimate the emissions costs. Values were updated using inflators to reflect current[49] prices, but applied consistently for future years, reflecting a conservative position. The following dollar rates were used:

Emissions Costs per ton	2025	2025
Pollutant	Urban	Rural
$PM_{2.5}$	$1.02m	$58,400
NO_x	$1.03m	$28,600
CO	$5.80	$0.23
Volatile organic compounds	$1,840	$72.60

The underlying methodology captures the cost of emissions in terms of health impacts - respiratory illnesses, cardiovascular conditions, etc. imposing costs on the health care system and reducing overall productivity. The guidance documents differentiate between urban and rural environments, reflecting the health impacts of emissions on areas through which the aggregate is transported. Urban areas, with higher population density, experience greater exposure to pollutants, while rural areas have large sections with little or no population exposure. The analysis accounts for the proportion of travel occurring in each area, as well as differences between loaded and unloaded trips.

To account for the economic cost of greenhouse gas emissions, the shadow price of carbon[50] is incorporated in the analysis. This includes the cost of mitigation, for example implementing carbon offset programs or transitioning to low-emission vehicles. Emissions are estimated by using CO_2-equivalent (CO_2-e), a common metric that converts different greenhouse gases into an equivalent amount of CO_2 with the same climate impact. This approach enables consistent reporting and comparison across gases. The shadow price of carbon is based on New Zealand Treasury's central track estimates and in 2025 is $122 per tonne.

4.1.3 Social Costs

Beyond transport and emissions costs, there are also social costs arising from road injuries and fatalities, which increase as travel distances rise. Each additional kilometre travelled by heavy vehicles incrementally increases the risk of an injury, serious injury or fatal crash. Social cost estimates are derived from the Ministry of Transport's Social Cost of Road Crashes and Injuries[51] report, combined with vehicle distance travelled information and other relevant Ministry of Transport (MoT) datasets, and expressed in 2025 dollars (Table 4-3). The latest update (2024) of the MoT report differentiates between average cost per crash on urban roads and rural roads, as well as by region. The ratios presented here are for the Auckland region.

[49] 2025

[50] The shadow price of carbon does not reflect environmental damage arising from climate change.

[51] Tables 15-17. Average social costs per reported crash by region and road type (urban/rural).

Table 4-3: Social Costs Values

	Deaths	Serious Injury RURAL	Minor Injury	Deaths	Serious Injury URBAN	Minor Injury
Social cost ($m per instance, 2025 prices)	$16.38	$1.43	$0.37	$16.27	$1.33	$0.35
Deaths/Injuries per 100 million km truck movements	2.6	6.3	22.7	2.6	6.3	22.7
Cost per 100mil km ($)	$41.91	$9.00	$8.40	$41.62	$8.37	$7.82

Combining these rates with the distances travelled when aggregate is transported from the Clevedon Quarry to selected destinations, provides an estimate of the social cost that can be compared with aggregate sourced from alternative quarries. The difference represents the change in social costs due to the increased distances.

4.1.4 Opportunity Costs

Using land that is not zoned for quarrying will incur opportunity costs. Opportunity cost represents the value of the next-best alternative forgone when resources are committed to a particular activity. Opportunity cost can include a range of effects such as lost productivity, reduced flexibility or missed strategic advantages. Recognising opportunity costs helps ensure that decisions account for the full economic implications. The potential value of the foregone activity is a function of what could be undertaken on that land.

The proposed expansion will extend the quarry's operations onto land beyond the Special Purpose - Quarry Zone (SP-QZ) boundary (20.32 hectares including the overburden area). See Figure 4-1. For this report, the relevant areas are labelled 'Area A, B and C'. The land outside the SP-QZ comprises:

- Pit expansion onto **9.0 hectares** of Rural Production zoned (RPZ) land (Area A).
- Pit expansion onto **6.7 hectares** of RPZ land which is covered by the *Significant Ecological Area (SEA) – SEA_T_5588, Terrestrial* overlay (Area B).
- Overburden area which will be on **4.62 hectares** of RPZ land (Area C).

Estimating the scale of the opportunity cost is challenging because there is always uncertainty about the future and which alternative land use will eventuate. Nevertheless, it does not mean opportunity cost should be ignored. It is our understanding the area has recently been replanted in pine trees, and if the consent is not granted, forestry will remain the most likely land use, considering the topography and surrounding activity (i.e., forestry blocks). This section presents the assumptions applied to the land outside the SP-QZ to estimate the opportunity cost of the expansion.

Figure 4-1: Proposed Quarry Extent Outside Special Purpose - Quarry Zone

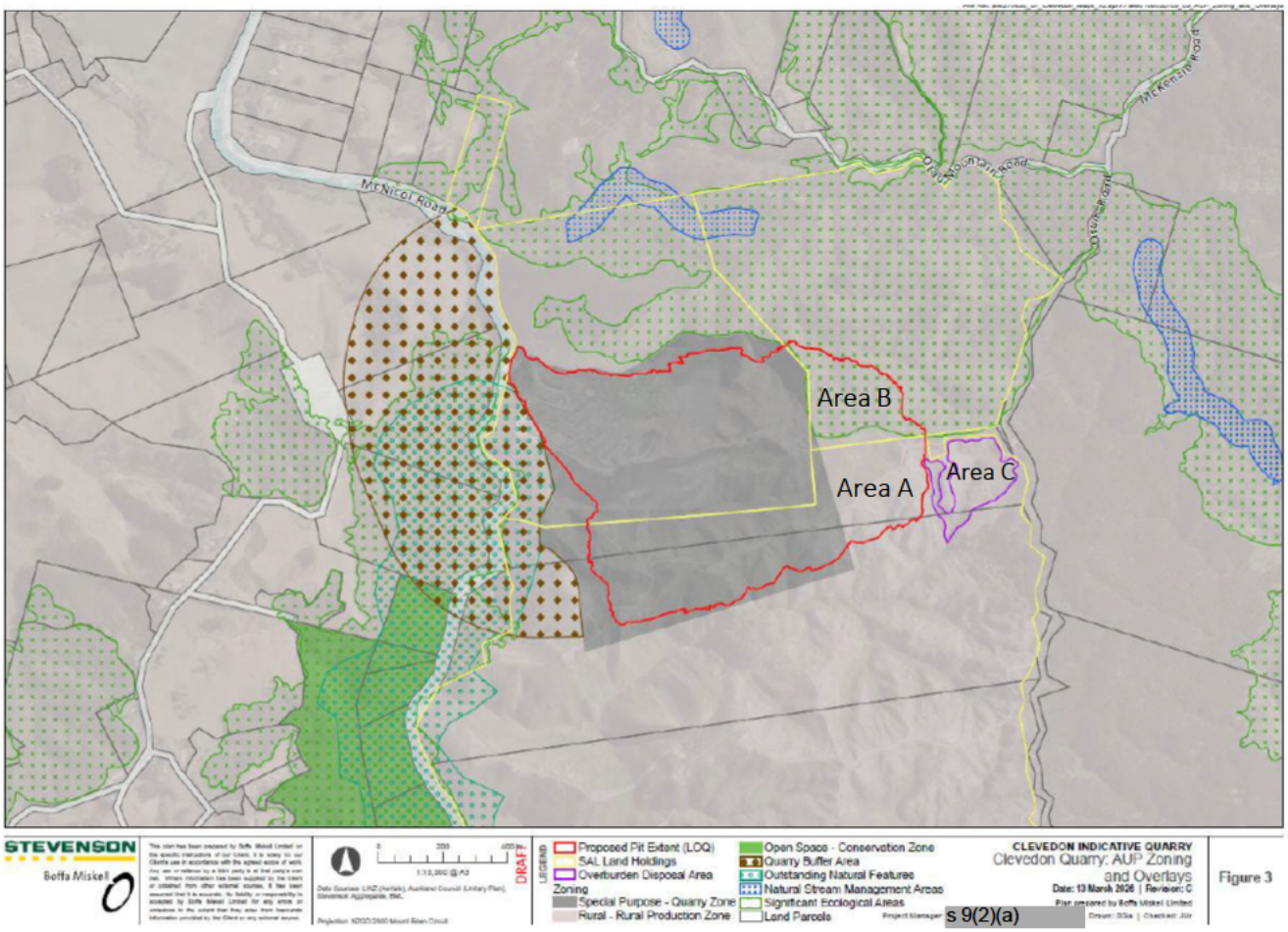


Figure 3

Rural Production Zone (Areas A and C)

Notwithstanding considerations such as the minimum area needed to undertake the alternative use (e.g., forestry), the potential foregone production revenue of forestry is used as a proxy for the potential opportunity cost of expanding the quarry onto land zoned as RPZ. It is estimated approximately 13.62 hectares of RPZ land will be taken up by the expansion. This excludes the area covered by the SEA which is considered separately. According to figures published by New Zealand Farm Forestry Association Inc, in 2018, the average annual net return per hectare, was around $1,150. Adjusting this to 2025-dollars, using the Producers Price Index[52], suggests the average annual return of forestry is approximately $1,135 per hectare. This was used to estimate the potential revenue that would be 'foregone' if the quarry is expanded into the RPZ.

The opportunity cost of the proposal is applied from 2054 onwards since the existing (2018) consent remains valid until 2053. If the proposed consent is granted, the net benefit arises from the additional extraction that would occur after 2053. Likewise, the cost of the proposal - the opportunity cost of committing the expansion area to quarrying rather than its most likely alternative use, forestry - only

[52] Published by StatsNZ. Outputs (ANZSIC06) - NZSIOC level 4, Base: Dec. 2010 quarter (=1000) (Qrtly-Mar/Jun/Sep/Dec). Forestry and Logging sector.

arises from 2054 onwards. Before that time, the RPZ land is available for alternative uses, and therefore no opportunity cost is incurred.

While we recognise there is a degree of uncertainty about the staging, the analysis aligns with assumptions used throughout the assessment. Importantly, we are not suggesting this land will definitely be used for forestry in future, but this is a way of showing the scale of opportunity cost that was considered.

Significant Ecological Area (Area B)

Ecosystems provide a range of benefits like clean water, fertile soil, pollination, climate regulation and the general amenity that comes from an undeveloped landscape. When land is used for quarrying, some of these services are reduced or no longer provided in the same way. The value of these foregone services represents part of the opportunity cost of choosing quarrying over an alternative land use. Although there is increasing consensus that these ecosystems perform valuable services, there is debate over how to assign specific economic values to them.

On the area covered by the SEA overlay (6. 7 hectares), the opportunity cost is equal to the passive value of the land. The estimated value is based on research by Patterson and Cole (2013)[53] in an attempt to evaluate the economic value of New Zealand's land-based ecosystems and their services. The report suggests a 'per hectare passive value' for land reserves of around $1,982 per hectare (2012 NZD). We used this value as a proxy to estimate the potential value of ecosystem services delivered by the area identified as SEA on the quarry site (Area B). The value was adjusted using the NZ Implicit Price Deflator to express it in 2025 terms. This lifts the value to $2,781 per hectare. As this is applied from 2054 onwards.

Other benefits

We recognise that the environmental (eco-system services) benefit of the SEA is only one aspect of the wider benefits if the quarry is prevented from expanding. Some households/individuals derive value from other aspects. For example, a person might derive pleasure (value) from living next to native bush, a stream or a body of water. It is difficult to put a firm 'price' on these values, and they are often very subjective. While it is acknowledged that these aspects add to the opportunity cost of expansion, the report has not attempted to value these.

4.2 Results

This section presents the modelling results using the parameters and values outlined in the previous section, together with annual aggregate movements (km travelled) to and from Clevedon Quarry and the comparator quarries.

[53] Patterson, M.G., & Cole, A.O. (2013). "Total economic value" of New Zealand's land-based ecosystems and their services. In J.R. Dymond (Ed.), Ecosystem services in New Zealand – conditions and trends (pp. 496–510). Manaaki Whenua Press, Lincoln, New Zealand.

4.2.1 Annual Costs

The assessment estimates the transport, emissions and social costs associated with Clevedon's average annual aggregate production over the past three years[54], and then also consented[55] levels. These are compared then against the cost of delivering the aggregate through the Smythes and Maungaturoto alternatives. Table 4-4 firstly compares costs for annual production of 330,000 tonnes. The results highlight the additional costs that would arise if aggregates were sourced from alternative locations and reflect an annual basis. Recall, Smythes and Maungaturoto quarries are used as comparator quarries, i.e., the next best option. In evaluating costs and benefits, avoided costs are considered benefits.

Table 4-4: Cost of Alternatives – 330,000 tonnes per annum

	Total driving distance (million km)	Transport costs	Emissions costs	Social costs	Total costs
Clevedon Quarry	0.6	$5.7m	$1.6m	$0.4m	$7.6m
Smythes Quarry	1.5	$8.0m	$3.0m	$0.9m	$11.9m
Maungatoroto Quarry	3.9	$13.8m	$4.7m	$2.3m	$20.8m
Additional from Smythes Quarry	0.9	$2.3m	$1.4m	$0.6m	$4.2m
Additional from Maungatoroto Quarry	3.3	$8.2m	$3.1m	$1.9m	$13.2m

Delivering 300,000 tonnes of aggregate from Clevedon Quarry results in total costs of $7.6 million per annum. However, if the same quantity of aggregate were delivered from the more distant sources, costs could be substantially higher due to the increased distance. The additional costs for the comparator quarries are as follows:

- Smythes: +$4.2 million
- Maungaturoto: +$13.2 million.

Therefore, enabling the quarry extension to deliver aggregate to the market and avoiding these additional transport costs will yield a cost-saving (benefit).

At a potential production level of 330,000 tonnes per annum, the **total net cost reduction ranges from $4.2 million to $13.2 million annually, compared with the Waikato and Northland alternatives.**

Transport makes up the largest share of the total cost of aggregate. It is highly likely that these costs are passed on to end-users through higher aggregate prices, affecting consumption costs for stakeholders, which include local councils, developers, households (homeowners/buyers) and businesses. The increased costs faced by intermediate or end users, for the same product, points to systemic inefficiencies.

Environmental costs relate specifically to emissions and are calculated by combining travel distances with emission factors and costs, as outlined previously. Based on the modelling, the estimated annual cost of emissions is $1.6 million for aggregate sourced from Clevedon Quarry, compared to $3.0 million

[54] 330,000 tonnes.

[55] 3 million tonnes.

from Smythes and $4.7 million from Maungaturoto. This suggests granting the consent would avoid emissions costs of between $1.4 million and $3.1 million, annually.

Social costs affect the wider community, even if only a small proportion of people are involved in road accidents. The annual social costs are estimated at $365,000 for aggregate sourced from Clevedon Quarry, compared to $915,000 from Smythes and $2.3 million from Maungaturoto. This suggests, enabling the extension to the Clevedon Quarry will avoid social costs ranging from $550,000 to $1.9 million per year, based on the Waikato and Northland alternatives, respectively.

Table 4-5 shows the same costs if the quarry were to produce its consented volumes, i.e., 3 million tonnes per annum. The modelling results suggest the **total cost savings** of sourcing aggregate from Clevedon (relative to comparator quarries) **could be between $38.6 million and $119.8 million per annum**.

Table 4-5: Cost of Alternatives – 3 million tonnes per annum

	Total driving distance (million km)	Transport costs	Emissions costs	Social costs	Total costs
Clevedon Quarry	5.6	$51.5m	$14.6m	$3.3m	$69.4m
Smythes Quarry	14.1	$72.7m	$27.0m	$8.3m	$108.0m
Maungatoroto Quarry	35.3	$125.7m	$42.7m	$20.8m	$189.2m
Additional from Smythes Quarry	8.5	$21.2m	$12.4m	$5.0m	$38.6m
Additional from Maungatoroto Quarry	29.7	$74.2m	$28.1m	$17.5m	$119.8m

4.2.2 Lifecycle Costs

While the annual cost savings are significant, when the total additional aggregate provided by the extension is considered over the life of the resource, the scale of the potential long-term cost savings becomes evident.

If the consent is granted, Clevedon Quarry could provide a total aggregate resource of approximately 150 million tonnes over 50 years. The current (2018) consent, enables extraction of up to 60 million tonnes. This indicates, an additional 90 million tonnes of aggregate would be made available to the market beyond the current consented limit. The current (2018) consent expires in 2053, implying the proposal would prolong the life of the Quarry by around 23 years[56].

It is acknowledged that extraction rates are demand-driven, and the volumes and timeframe will depend on actual market conditions. However, the benefits of securing a longer-term sustainable supply of aggregate to the construction sector (and the economy as a whole) are material.

This section assesses the total cost[57] of extracting 3.0 million tonnes of aggregate annually over a 23-year period (2054 to 2076). Costs are discounted to the present (2025), representing the 'lifecycle costs' of the proposal. The estimated lifecycle costs associated with supplying the additional aggregate

[56] This assumes consent is granted in 2026.

[57] Transport, environmental and social costs.

volume from Clevedon, are compared with the cost of sourcing the aggregate from alternative sources (Smythes and Maungaturoto). Costs were discounted in line with Treasury guidance[58] as follows:

- Years 1 to 30 2% discount rate
- Years 31 to 65 1.5% discount rate

Mandatory sensitivity testing was carried out using a discount rate of 8%. The lower discount rates give more weight to long-term benefits (avoided costs), compared with an 8% discount rate. The results are summarised in Table 4-6.

Table 4-6: Cost of alternatives over the life of the proposed consent (net additional resource)

	Total driving distance (million km)	Transport costs	Emissions costs	Social costs	Total costs
2% DISCOUNT RATE					
Clevedon Quarry	129.2	$653.2m	$184.8m	$41.8m	$879.9m
Smythes Quarry	324.0	$921.6m	$342.0m	$105.5m	$1,369.1m
Maungatoroto Quarry	811.8	$1,593.5m	$541.1m	$263.2m	$2,397.8m
Additional from Smythes	194.8	$268.4m	$157.1m	$63.7m	$489.2m
Additional from Maungatoroto	682.6	$940.3m	$356.3m	$221.4m	$1,518.0m
8% DISCOUNT RATE					
Clevedon Quarry	129.2	$66.9m	$18.9m	$4.3m	$90.1m
Smythes Quarry	324.0	$94.4m	$35.0m	$10.8m	$140.3m
Maungatoroto Quarry	811.8	$163.2m	$55.4m	$27.0m	$245.6m
Additional from Smythes	194.8	$27.5m	$16.1m	$6.5m	$50.1m
Additional from Maungatoroto	682.6	$96.3m	$36.5m	$22.7m	$155.5m

Key observations are:

- The total cost of supplying aggregate from Clevedon Quarry is estimated to cost around $879.9 million over a 23-year period[59], reflecting a 2% discount rates. Using an 8% discount rate reduces the cost to $90.1 million.
- Equivalent supply from Smythes Quarry is estimated to cost $1.4 billion (2% discount rate), suggesting cost-savings (benefit) of $489.2 million, if aggregate is sourced from Clevedon. Using a higher discount rate, reduces the value of the benefit to $140.3 million.
- Equivalent supply from Maungaturoto Quarry is estimated to cost $2.4 billion (2% discount rate), suggesting cost-savings (benefit) of around $1.5 billion, if aggregate is sourced from Clevedon Quarry. Using a discount rate of 8% would reduce the benefit to $155.5 million.

Enabling the Clevedon Quarry extension would generate **significant long-term cost savings** (benefits) relative to sourcing aggregate from more distant locations. The results suggest that the Clevedon Quarry extension would contribute to a more cost-effective supply of aggregate to the market, reducing

[58] https://www.treasury.govt.nz/information-and-services/public-sector-leadership/guidance/reporting-financial/discount-rates

[59] 2054 to 2076

overall transport-related expenditure and associated environmental and social impacts over the life of the consent.

4.2.3 Opportunity Costs

The proposal will expand the quarry onto circa 19 hectares of land beyond the SP-QZ. Using this land for quarrying will incur opportunity costs. Based on the assumptions presented in section 4.1.4, the annual value of opportunity costs will be in the order of $34,100. Over a 23-year[60] period, the present value of the opportunity cost associated with the foregone activity is comparatively modest (Table 4-7).

Table 4-7: Opportunity Cost (present value @ different discount rates)

	Size (hectares)	$ (million)	
		2%	8%
Proposed Pit – Rural Production Zone	9.0	0.13	0.01
Proposed Pit – Significant Ecological Area	6.7	0.27	0.02
Overburden Area 1 - Rural Production Zone	4.6	0.07	0.01
Total	**20.3**	**0.43**	**0.04**

The present value of opportunity costs ranges from $44,200 (8% discount rate) to $431,700 (2% discount rate). These values indicate that, while the proposed expansion will result in some opportunity costs from foregone alternative land uses, it is very small compared to the potential economic benefits.

4.3 Other Economic Considerations

In addition to the quantified benefits (cost savings) associated with Clevedon Quarry being a closer source of aggregate to the Auckland market (discussed in the next section), the proposed expansion gives rise to a range of further economic benefits. These benefits are more difficult to quantify with the information currently available but are nonetheless important in understanding the overall economic contribution of the proposal.

As outlined in the memorandum[61] (Proposed Clevedon Quarry Expansion, 24 March 2026) prepared by the quarry operator, the proposed expansion will improve the efficiency of resource extraction. The revised pit design, informed by improved geological and geotechnical understanding, is described as enabling better access to high-quality rock and a more favourable balance between overburden and usable material. On the basis of this information, it is reasonable to conclude that a greater proportion of extracted material would be saleable, reducing waste and lowering production costs over time. From an economic perspective, this represents a more efficient use of the resource and an increase in its overall value.

The memorandum also identifies a number of operational improvements associated with the expanded design. In particular, the larger quarry floor will allow for on-site storage of different grades and volumes

[60] 2054 to 2076.

[61] Prepared by Bryn Llewellyn - Resource Engineer, Stevenson Aggregates.

of aggregate, reducing the need for repeated handling and movement of materials and enable more responsive supply of products to the market. Taking these points as described by the operator, such improvements will reduce operating costs and improve supply reliability, both of which have clear economic benefits.

Further efficiencies are identified in relation to the revised staging of the quarry. The memorandum notes that the proposed staging would support continuous operations by maintaining workable extraction areas and access for plant and infrastructure. On this basis, it is reasonable to infer that the likelihood of operational disruptions would be reduced, supporting consistent production levels. From an economic perspective, this will contribute to more stable supply and helps to avoid cost increases associated with interruptions to production.

The memorandum also highlights the long-term nature of the resource enabled by the expansion, with access to a substantial volume of aggregate over an extended period. This provides a high degree of supply certainty for the Auckland market. In economic terms, a secure and reliable local source of aggregate reduces reliance on more distant suppliers, reinforcing the transport-related cost advantages identified in the quantitative analysis and contributing to lower overall supply costs.

In addition, the increased scale of the operation (i.e., the total volume enabled) will generate efficiencies associated with economies of scale. As described in the memorandum, the expanded footprint supports significant long-term investment in infrastructure and operations. Spreading these costs over a larger volume of production reduce average costs per tonne, eimproving the efficiency and competitiveness of the quarry.

Finally, the memorandum indicates that the scale and duration of the proposed expansion would support ongoing investment and sustained operations over a longer time horizon. While these effects have not been quantified, they are expected to result in continued economic activity, including employment and associated income generation.

Overall, while these benefits have not been quantified due to current data limitations, the information provided in the operator's memorandum indicates that the proposed expansion will in their opinion, improve production efficiency, support reliable long-term supply and reduce operational costs. These outcomes have clear economic value and reinforce the transport-related cost savings identified in the preceding quantitative analysis.

4.4 Summary of Costs and Benefits

Considering the transport, environmental, and social costs outlined above, extraction from the Clevedon Quarry site, based on average production volumes over the past three years (~330,000 tonnes), is estimated to deliver savings of approximately $4.2 million to $13.2 million per annum, compared with the Waikato and Northland alternatives. If production is lifted to the consented maximum, the annual cost-savings ranges from $38.6 million to $119.8 million.

The present value of the total cost reduction enabled by the proposal, from supplying aggregate from the Clevedon Quarry is estimated to range between **$489.2 million and $1.5 billion,** (2% discount rate; 23 years[62]) relative to Smythes and Maungaturoto, respectively.

The benefit (potential revenue and value of eco-system services) which is foregone if the expansion goes ahead is viewed as the 'cost' of the proposal, i.e., opportunity cost. The annual value of the opportunity cost is in the order of $34,100. The present value of the opportunity cost is estimated to be between **$44,200 and $431,700,** reflecting discount rates of 8% and 2%, respectively.

In addition to the quantified cost savings, the operator's memorandum identifies a range of economic benefits associated with the proposed expansion, which cannot currently be quantified with the available information. These include **improved efficiency** in resource extraction, **lower operating costs**, enhanced **operational continuity** and greater **long-term certainty** of aggregate supply. From an economic perspective, these factors are expected to increase productivity and reduce the average cost of supply, reinforcing the transport-related savings outlined above. While these benefits have not been quantified, they provide further support for the overall economic advantage of the proposal.

Overall, the results indicate that the cost savings associated with granting consent for the expansion of Clevedon Quarry represent a substantial economic benefit to the Auckland economy, while the associated opportunity cost is relatively small in comparison.

The estimates are viewed as conservative since it assumes that existing out-of-region quarries can fully compensate for Auckland's shortfall. In reality, as Auckland's demand for aggregate grows, the gap widens and the region's reliance on out-of-region supply grows. If additional in-region sources cannot be secured, transport costs are likely to increase substantially, as aggregate is sourced from progressively more distant locations. While Waikato is the most probable source region, future supply constraints could push sourcing even further afield.

It is important to note that these impacts are based on current market conditions and today's distribution of demand and growth patterns. As Auckland continues to expand and development shifts geographically, the associated transport profiles and impacts will change. Future greenfield supply sites will need to be assessed within the prevailing market context at the time to ensure accurate evaluation of costs and benefits.

[62] 2054 to 2076.

5 Conclusion

Auckland's growth depends on reliable, affordable access to aggregate. It is essential for housing, commercial development, transport infrastructure and ongoing renewals. Demand for aggregate is projected to rise steadily, and under almost all scenarios Auckland's local supply will fall short, creating a widening gap that will increasingly rely on imported (from other regions) aggregate.

Clevedon Quarry is well positioned to help close this gap. Its location near major growth areas means aggregate can be delivered more efficiently and with far lower transport, emissions and social costs than importing material from Waikato or Northland. The analysis shows that even under lower than consented extraction rates, the economic benefit of securing aggregate from Clevedon Quarry, is significant. Based on the modelling results, expanding the quarry could avoid around $4.2 to $13.2 million[63] in costs each year. If higher volumes are extracted, savings would be even greater. The long-term savings[64] is valued between $489.2 million and $1.5 billion[65] (2% discount rate, 23 years). In contrast, the opportunity cost of using the land for quarrying is very small by comparison.

In addition to these quantified benefits, the operator's memorandum identifies a range of further advantages associated with the proposed expansion, including improved efficiency in resource extraction, lower operating costs enhanced operational continuity and greater long-term certainty of supply. From an economic perspective, these factors are expected to increase productivity and reduce the average cost of aggregate over time, reinforcing the transport-related savings identified in the quantitative analysis.

Additional local supply will also support competition, helping to stabilise prices and reducing cost pressures on construction and infrastructure delivery. This is critical for keeping housing affordable, enabling timely infrastructure upgrades and maintaining Auckland's economic competitiveness. As the region continues to grow, the benefits of efficient, local supply will become even more important.

Overall, from an economic perspective, expanding Clevedon Quarry offers substantial benefits by avoiding transport-related costs while also improving the efficiency and reliability of aggregate supply. It provides a strategically located, cost-effective and sustainable source of aggregate that will help Auckland meet its future development needs while minimising wider impacts.

[63] Based on annual production of 330,000 tonnes.

[64] Avoided transport-related costs enabled by the proposal.

[65] Based on annual production of 3.0 million tonnes.

6 Appendices

Appendix 1 - Auckland Quarries

Quarry Name	Company	Material	Est. Volume (t)	Address	Other Info
Brookby	Kaipara	Greywacke	2,800,000	149 Kimptons Road, Whitford, Kaipara	The Brookby greywacke quarry is owned by Brookby Quarries, a subsidiary of Kaipara. Brookby is located in Whitford, Auckland and is one of the largest quarries in the region. It has been operating since 1940 and supplies its products, including premium basecourses, concrete aggregate and sealing chip, to customers throughout Auckland. The quarry is capable of producing and supplying 3.5 million tonnes per annum that largely contributes to Auckland's growing urbanisation and resulting infrastructure needs. In July 2016, the company forecast that if demand conditions develop in Auckland as expected, Brookby's market share is expected to reach between 22 and 28 per cent by 2025. In 2025 Brookby Quarries Ltd was granted resource consent under the Covid-19 Recovery (Fast-track Consenting) Act 2020, to expand its operation at Brookby quarry. The proposal (Stage 3) is to extract around 110 million tonnes of aggregate over a period of 60 years.
Clevedon	Stevenson Aggregates; Fulton Hogan; Warren Fowler Earthmovers	Greywacke	300,000	546 McNicol Road, Clevedon	The Clevedon quarry (formerly known as McNicol Road) is a greywacke quarry located in Clevedon and owned by Fulton Hogan subsidiary Stevenson Aggregates. Fulton Hogan had acquired the quarry in January 2016 from the Warren Fowler Group, which had owned the quarry since the 1990s. It is outfitted with mobile quarrying, crushing and screening capabilities and supplies a full range of roading and drainage aggregates. It is understood to produce up to 300,000 tonnes per year. The quarry comprises about 4.3 million cubic-metres of solid blue greywacke rock and a further 1 million cubic-metres of brown rock. Fulton Hogan acquired the quarry to both replace declining production at its nearby Whitford quarry and resource-up for ongoing Auckland construction growth. The company was granted resource consent for a quarry extension in February 2018 to extract up to 3 million tonnes per annum. Conditions on the quarry's expansion include restrictions on truck movements.
Coatesville	Coatesville Quarry	Aggregates		132 Robinson Road, Coatesville	Coatesville Quarry on Robinson Road in Coatesville, Auckland, is owned by Zambuca family interests. The rock is conglomerate and has not been quarried for well over a decade. The pit is full of water. In May 2022 the whole property was put on the market for sale, as a quarry and/or for potential development, but as at early July 2022, remains unsold.
Drury	Stevenson Aggregates	Greywacke	3,500,000	Corner Fitzgerald Road and Quarry Road, Drury	The Drury quarry is located in Auckland and owned by Fulton Hogan subsidiary Stevenson Aggregates. It produces up to three million tonnes of aggregates annually from a greywacke resource. The 56-hectare quarry sits across a vast 800-hectare land holding and has a 150-year-plus resource. It is one of the largest quarries in New Zealand. It is also one of the largest in Auckland, satisfying more than one-quarter of the region's annual demand. It provides some 40 per cent of Auckland's total concrete aggregate resource. Drury was previously owned and operated by Stevenson Group. In October 2018, Fulton Hogan acquired Stevenson's Construction Materials business, including the Drury quarry, and the company's concrete plants, transport and laboratory businesses. Processing plant: Drury has a tertiary stage fractionisation plant onsite, which blends products exactly to specification from weight-scaled bins providing a focus on grade control for customers. The company has an asphalt chip plant from which it supplies roading contractor Downer, which also recycles aggregates on site. There is a continuous mixing pug mill that consumes lots of by-products such as the soft mudstone rock papa, and minimises waste. A substantial onsite accredited laboratory provides aggregate testing services. There is also a managed fill facility onsite. Expansion: In 2016 the company took the main pit deeper. At the time the pit had 30 years of resources left at current extraction volumes. Stripping from this pit is placed in its Thorburn overburden area. The company also wanted to develop the Sutton pit, which they had land use consent for. Extraction was planned to occur in 10-15 year's time. Expansion of the quarry onto what is known as the Sutton Block has been granted consent under the Fast Track Approvals Act (2024). The expansion would supply at least 185 million tonnes over its life (reported to be around 50 years).

Quarry Name	Company	Material	Est. Volume (t)	Address	Other Info
Ellets	Ihumatao Quarries	Basalt, scoria	250,000	Ihumatao Road, Mangere	The Ihumatao quarry is owned by Ihumatao Quarries, which has Ellet family Trust interests. It is located near Auckland Airport, in Mangere. The rock resource is scoria and basalt rock. It also has a managed fill. Annual production is around 250,000 tonnes, which is within their consented volumes. The products include Scoria 20/7, 50/20, 150/50, PAP7. The basalt products are GAP7, GAP20, GAP40, GAP65.
Flat Top	Winstone Aggregates	Basaltic andesite	800,000	Haruru Road, RD 3, Kaukapakapa	Flat Top quarry is owned by Winstone Aggregates, an operating division of Fletcher Building. It is located in Kaukapakapa, north of Auckland. In July 2014, Winstones was granted approval to extend the quarry by 10 hectares. Considerable overburden removal and quarry development has taken place since that time. The basaltic andesite rock is used to make roading and construction products. Its core product list also includes bulk-fill, landscaping and farm maintenance products. Flat Top quarry expansion is one of the listed projects of the Fast Track Approvals Act (2024). Consent would enable the extraction of approximately 9.2 million cubic metres of rock resource.
Glorit	James Hardie	Silica		2774 State Highway 16, Glorit	The Glorit silica sand quarry is owned by James Hardie and located on the Kaipara Harbour, north of Auckland. The company extracts sand from the site and transports the raw materials to its manufacturing facilities in Penrose where it is used in the manufacture of fibre cement building materials. In 2018 the company received resource consent and Overseas Investment Office approval to start a new quarry - McLachlan Road - about 16 kilometres south of Glorit, as the life of the existing quarry was coming to an end.
Helensville Sand	Winstone Aggregates	Sand		20 Saleyard Street, Helensville	Helensville sand quarry is owned by Winstone Aggregates, an operating division of Fletcher Building. It is located on the Kaipara Harbour in Helensville. Sand extracted from the site is used primarily in concrete and civil construction products.
Henderson	The Urban Quarry	Aggregates		Selwood Road, Henderson	
Hill Top Lime	Hill Top Lime Works	Limestone		341 Kaipara Coast Highway, Wellsford	Hill Top Lime quarry is owned by Hill Top Lime Works and located in Wellsford.
Houghtons	Sandstone Developments	Sandstone		451 Muriwai Road, Waimauku	Houghtons quarry is owned by Sandstone Developments. It is located in Muriwai, Auckland and provides landscaping products.
Hunua	Winstone Aggregates	Greywacke	2,800,000	Hunua Gorge Road, Hunua, Papakura	Hunua quarry is owned by Winstone Aggregates, an operating division of Fletcher Building. It is located near Papakura, south of Auckland. The quarry spans across 240 hectares and is situated within a high-quality greywacke rock resource. Hunua is one of the largest suppliers of aggregates to Auckland. Hunua rock products are used primarily in the infrastructure sector for concrete production and roading projects. The processing plant has an annual output of around two million tonnes. The quarry sees around 250-300 truck movements per day. The quarry has been operating since the 1920s, and its current extraction area is at the end of its life. The old pit is now used as a managed fill site. A second extraction area - Symonds Hill - was consented and operates from Symonds Hill. The new Symonds Hill pit sits on land adjacent to the Hunua quarry, with the centre of the new pit about 1 kilometre south-east of the existing processing plant. Hunua's existing processing plant, stockyard, site infrastructure (including weighbridge) and Hunua Gorge Road access will all be used for Symonds Hill. Hunua quarry expansion is one of the listed projects of the Fast Track Approvals Act (2024). Application will be made for consent to increase annual quarry production to approximately 5.4 million tonnes of aggregate, and to enable the extraction of aggregate for a further 80 years.

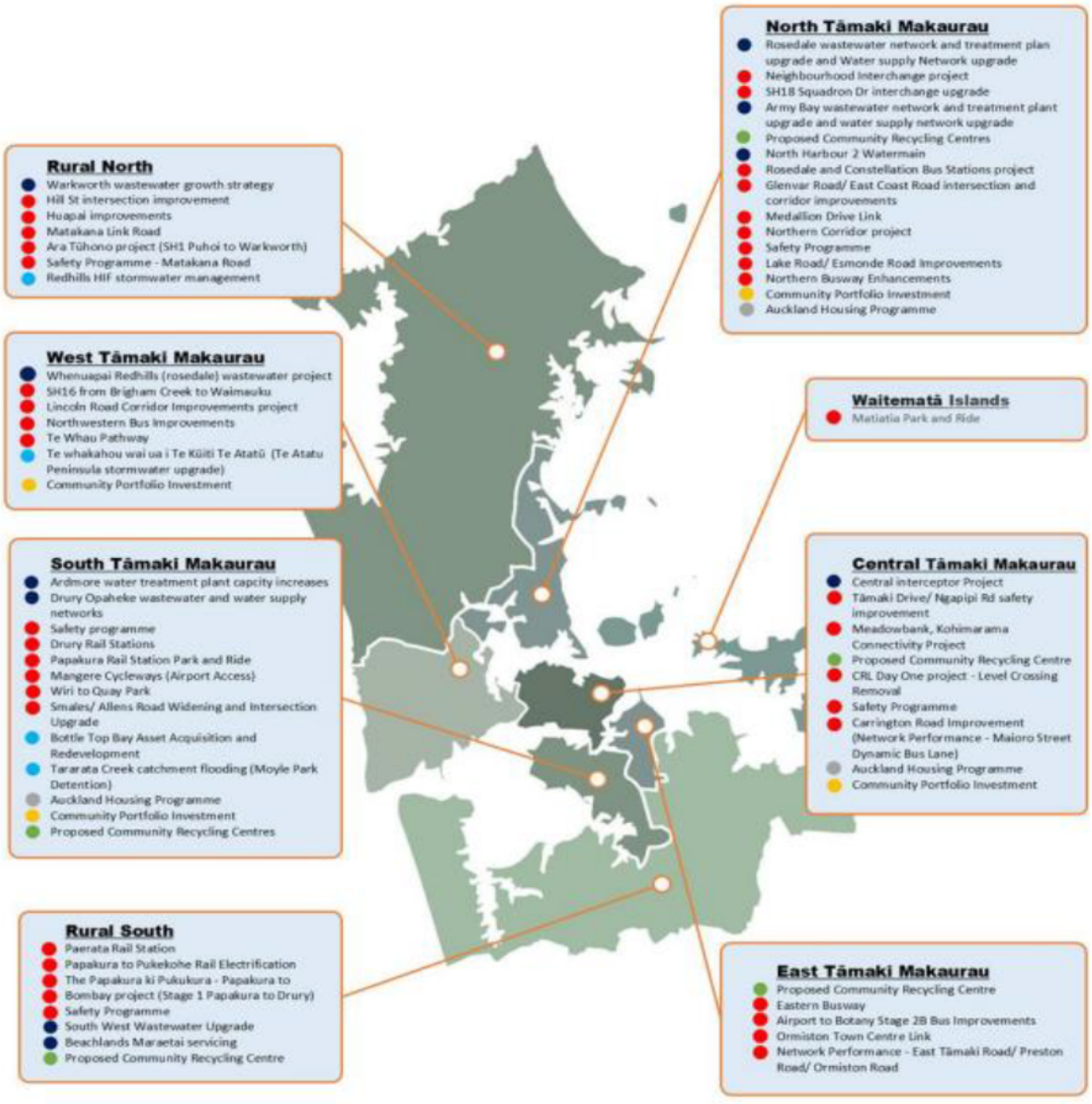
Quarry Name	Company	Material	Est. Volume (t)	Address	Other Info
Kaipara (Tapora Sands)	Tapora Sands	Silica		801 Burma Road, Tapora	
Kaipara Harbour Dredge (Atlas)	Atlas Concrete	Sand	230,000	Kaipara Harbour	Kaipara Harbour Dredge is operated by Atlas Concrete and is located just off-shore in the Kaipara Harbour. It supplies sand from the dredge for building, concreting, landscaping and construction needs.
Karamuramu Island	McCallum Brothers	Chert		Auckland	Karamuramu Island quarry is owned by the McCallum Brothers. It is located on Karamuramu Island in the Hauraki Gulf. The quarry's key products include aggregate, paving, sand and shells which are used in a range of industries from beach rejuvenation to trotting tracks for racecourses. It is estimated that the reserves of rock available at the quarry measure over several million cubic metres. It is estimated that the reserves of rock available at the quarry measure over several million cubic metres.
Kings	Kings Quarry	Greywacke		306 Pebblebrook Road, Wainui	Kings quarry, is located at 306 Pebblebrook road, on 167ha of freehold land in Wainui - between Kaukapakapa and fast-growing Silverdale in an area Auckland Council has prioritised for future urban expansion. The site hadn't been quarried since 1995 but maintained its special purpose quarry zoning under Auckland Council's Unitary Plan. The quarry was first established by Joseph Samuel King, in the 1920 and has remained in King family ownership until 2022 when it was sold to part owners Semenoff family interests. The quarry is now set up with new MWS washing and screening plant supplied by Equip 2 Processing Solutions and includes a radial conveyor to feed separate product stockpiles. The rock resource is an Albany conglomerate and largely comprises a silty sand or sandy silt matrix and sub-rounded 'clasts' ranging in size from fine gravels to cobbles. The pebbles are composed of a number of different kinds of rock, some very hard. Previously the quarry has produced roading metals, concrete mix, farm race mix, landscape products, fines for sub-base fill, and washed sand. A similar product mix will continue under the new ownership. Kings quarry has applied for Stage 2 and 3 expansion under the Fast Track Approvals Act 2024. The expansion is one of the listed projects in the Act. Up to approximately 500,000 tonnes/year are proposed to be extracted for approximately 100 years (up to 60 years for Stage 2 and up to 40 years for Stage 3).
Manukau (formerly Beachlands)	Nahkle Group	Greywacke	200,000	885 Whitford-Maraetai Road, Beachlands, Whitford	Manukau quarry, formerly Beachlands quarry, is owned by the Nakhle Group. It is located in Beachlands, south-east of Auckland. It can produce up to 200,000 tonnes of aggregate per annum, though like many other quarries has truck movement limitations.
Matakana	Wharehine	Greywacke	300,000	309 Omaha Valley Road, Matakana	The Matakana (or Rauners) quarry is owned by Wharehine. It is located near Matakana, north of Auckland. The quarry covers 24 hectares of land and has been operating since 1979. It has provided aggregates for a number of significant roading projects including more than 300,000 tonnes of metal for the Northern Gateway Toll Road and more than 8,000 cubic metres of special grade coarse aggregate for asphalt production.
McLachlan Road	James Hardie	Silica	23,000	353 McLachlan Road, Kaukapakapa	Fibre cement board manufacturer James Hardie received resource consent in June 2018 to establish a silica sand quarry near Kaukapakapa, north of Auckland. The following December it was cleared by the Overseas Investment Office to buy 61 hectares of land to operate the quarry on. The firm has consent to extract 23,000 cubic metres of silica sand each year over a 35-year period. The silica sand will be transported from the quarry to James Hardie's Penrose plant. The silica sand will be transported from the quarry to James Hardie's Penrose plant. James Hardie manufactures fibre cement building materials using cellulose fibre, Portland cement, sand and water. Its products include exterior claddings, internal linings and fire-resistant and acoustic wall panels.

Quarry Name	Company	Material	Est. Volume (t)	Address	Other Info
Millbrook	Wharehine	Greywacke	400,000	1673 Pakiri Road, Wellsford	Millbrook quarry is wholly owned by Wharehine. It has been serving the Rodney district for more than 50 years. Wharehine purchased former shareholder Holcim NZ's 50 per cent shareholding in Millbrook Quarry in 2017. Millbrook has provided large volumes to big infrastructure projects, such as the Puhoi to Warkworth motorway and more recently to the Matakana Link Road. The quarry covers over 240 hectares. It is a significant provider of aggregates to the Rodney district and produces concrete chip aggregates for use in tunnels and bridges, roading projects and diverse concrete structures. Annual production can vary with the impact of large infrastructure projects but otherwise is typically around 400,000 tonnes.
Muriwai	Sandstone Developments	Sandstone			
NZ Steel Aggregates	New Zealand Steel; BlueScope Steel	Slag; Aggregates	220,000	Glenbrook	NZ Steel Aggregates is a wholly owned subsidiary of Bluescope Steel. The site is a recycling plant that processes slag. Slag is a co-product of the iron and steel-making process that is created at the Glenbrook steel mill each year. The slag can be made into a wide range of aggregate products typically produced in hard rock quarries, up to 220,000 tonnes per year. Melter aggregates undergo the same process control and are tested to the same standards as quarried aggregates including grading and source properties. The aggregates have engineering properties, skid resistance and can be used for water treatment. The high PSV (polished stone value) of the sealing chip is a unique and is a critical source for road safety situations where a high degree of skid resistance is required. This product has been transported to road sites around the North Island and even parts of the South Island for over 10 years. Products include AP5/40, GAP 20/40/65, PAP5/10, drainage metal, rip rap ,sealing chip grades 3/4/5.
Pacific Steel Slag	New Zealand Steel	Slag		Beach Road, Favona	New Zealand Steel owns a slag quarry at its Pacific Steel mill in Otahuhu. Slag is a co-product of the iron and steel-making process that can be made into aggregate products such as scoria and river gravel. The aggregates have engineering properties, skid resistance and can be used for water treatment.
Pakiri	McCallum Brothers	Sand		Pakiri, south-east of Wellsford	The Pakiri coastal sand mining licence is owned by McCallum Brothers. Sand is dredged from consented marine coastal areas in Pakiri, Auckland. McCallum had 3 consents - a near-shore, mid-shore and far-shore. None of these are currently active.
Port Albert	Avoca Lime	Limestone		141 Underwood Road, Port Albert, Wellsford	The Port Albert quarry is owned by Avoca Lime and located in Port Albert, Wellsford in Auckland. Previously the quarry had been owned by Peter Booth, who had operated the site for the 12 years. Avoca took control of the site in September 2015, as part of a strategy to supply a wider geographical spread, and feed into the Northern Waikato. It is one of a number of quarries owned by the company, and supplies agricultural lime and blended fertiliser mixes, as well as crushed aggregates. Rarewa and Pokapu are the other lime quarries in the adjacent Northland region. Rock from this quarry is drilled, blasted and then processed using mobile impact crushers and screens. This mobile plant moves around each quarry to create stockpiles. A fixed crushing and pulveriser plant manufactures the Aglime. Products is sold into various markets: cycleways, horse arenas, forestry, roading and farm races, and the agricultural sector.

Quarry Name	Company	Material	Est. Volume (t)	Address	Other Info
Rodney Lime	Rodney Co-Operative Lime	Limestone		179 Sandspit Road, Sandspit, Warkworth	The Rodney Lime quarry is owned by Rodney Co-Operative Lime and is located in Warkworth, north of Auckland. The company first began a quarry operation in 1931 at Southgate but this was later sold. The current 18 hectare Sandspit operation was only built in 1973. The company specialises in agriculture lime, lime rock for all farm roads, race rock and is a Ballance agent. Rodney Lime's clients include small farm lots and extends to large properties. Over the last few years the quarry has been extended with the purchase of further land. A 35 tonne digger tears the rock from the quarry face and feeds it to a portable crusher to crush the rock to a usable state. Some of this rock is trucked to the company's crushing plant to make agricultural lime.
Selfs	Portage Quarries				
Silverhill	Levet Contracting	Limestone	25,000	137 Shepherd Road, Wellsford	The Silverhill quarry is a 5 hectare limestone quarry located in Te Hana. Before May 2015 it was owned by Borrows Farmers Lime, when it was transferred to Steve and Gladyse Levet. The quarry is consented until 2049 and has been known to produce up to 60,000 tonnes of product. However it currently produces around 25,000 tonnes per annum. The product is used for driveways, farm races and roading. It is also supplied to the forestry sector and Downer for council roading.
Steelserv	New Zealand Steel 50%, Slag Reduction 50%	Slag			
Tapora Sands (ISL)	Tapora Sands	Silica		Just north of 1000-1044 Burma Road, Tapora	Tapora Sands is a land-based sand quarry in Tapora. It is owned by ISL (Industrial Sands Ltd). Sand is extracted by excavator and is processed into a range of products for industry. The processing plant is located in Glorit near the southern part of Kaipara Harbour, north of Helensville. The Tapora sand is a white, high purity silica sand widely used for foundry casting and mould making. Other applications include, specialised flooring, resin and grout fillers, glass manufacturing and anti-slip surfaces.
Te Arai Point	Lake Road Quarries	?	60,000		
Tomarata Sand	Semenoff Sand Supplies	Sand		Atkins Road, Tomarata	Stan Semenoff owns a sand quarry on Atkins Road, at Tomarata, approximately 25 kilometres from Wellsford, north of Auckland. It was previously owned by Kaipara's subsidiary Coastal Resources, but sold to Semenoff in 2016. It has mobile screening and wash plants which produce both natural and washed sand products. The sand is supplied to concrete plants, contractors, landscapers, horse arenas, sports fields, racecourses and golf courses.
Tuakau	Stevenson Aggregates; Fulton Hogan	Sand; Pumice	200,000	Tuakau	The Tuakau quarry is owned by Fulton Hogan's subsidiary, Stevenson Aggregates, operational since July 2019. The sand and pumice quarry is located in Tuakau, south of Auckland and produces a range of products including gabion rock, scalpings, spalls, and builders mix. A full processing facility at the site began operating in 2012. Fulton Hogan acquired the quarry from Perry Resources in April 2017. The sale was part of Perry Group's sell-down of its quarry assets. In April 2016, Perry completed a deal with Waikato Aggregates that saw it unable to sell sand into the Waikato market. It is instead turned its focus on Auckland, and as of September 2016, reported that this market was strong and performing well. In November 2016, the quarry reported a production lift to well over 200,000 tonnes per annum on strong turf sand and roading project demand. Sand output has been growing, with the quarry focusing on the high-margin turf sand market, and its cleanfill volumes.

Quarry Name	Company	Material	Est. Volume (t)	Address	Other Info
Waiuku	Knight & Dickey	Sand		31 Collingwood Road, Waiuku	The Waiuku quarry is owned by Knight & Dickey. It is located on the outskirts of the Waiuku township north of Auckland. Knight & Dickey was established in 1962 and provides freight and transportation services in Northland.
Whangaripo	Rodney Aggregate Supplies	Greywacke	80,000	1039 Matakana Valley Road, RD2 Wellsford	The Whangaripo quarry is owned by Rodney Aggregates Supplies, a joint venture between Fulton Hogan and Winstone Aggregates. It was first established to provide aggregate for the Petrie family farm in 1937. Since then it has grown into a full-scale commercial operation and been leased to a number of operators, including Sharps, Wharehine, Bitumex and Winstone Aggregates. Once Rodney - owned by Fulton Hogan and Winstone Aggregates - had taken over the lease it sought consent for a quarry that can produce some 280,000 cubic metres annually (as per current consent limits). The quarry provides a range of products including sealing chip, concrete aggregates, GAP products, and asphalts.
Whitford	Fulton Hogan	Greywacke		Maraetai Road, Whitford	Whitford Quarry was closed down in October 2022, when it reached the end of its operational life as a quarry. Rehabilitation and planting were underway as of late 2022, and it will be returned to Auckland Council for use as an extension to the current Whitford landfill for extra capacity. The Whitford quarry was established at its current site in the 1940s. It was been operated by Fulton Hogan since 2004, and transferred to its subsidiary, Stevenson Agregates, on 1 July 2019. The land and mineral rights are owned by Auckland Council and Fulton Hogan, now Stevenson Aggregates, had a contract with the council to extract rock. The quarry site produced about 25,000 tonnes of aggregate products monthly; mostly used for roading or drainage.

Appendix 2 - Auckland Infrastructure capital investment growth projects (2024-2034)



Source: Auckland Infrastructure Strategy (2024)

- Red: Transport
- Green: Waste
- Dark blue: Community (e.g. Open space assets, community facilities, etc.)
- Light blue: Three waters
- Grey: Urban regeneration and non-service infrastructure (e.g. housing)
- Yellow: Cultural and economic (e.g. theatre, stadiums, museums, galleries, etc.)

Appendix 3 – Auckland Region's Aggregate Output Gap

	2025	2030	2035	2040	2045	2050	2055
	Medium Population Growth						
Aggregate Demand	16.2	17.2	18.3	19.3	20.3	21.2	22.2
Best case supply	17.2	21.1	21.1	21.1	21.1	21.1	21.1
Surplus/Deficit	1.0	3.9	2.8	1.8	0.8	-0.1	-1.1
Aggregate Demand	16.2	17.2	18.3	19.3	20.3	21.2	22.2
Worst case supply	17.2	17.2	17.2	17.2	17.2	17.2	17.2
Surplus/Deficit	1.0	-0.0	-1.1	-2.1	-3.1	-4.0	-5.0
	High Population Growth						
Aggregate Demand	16.3	17.8	19.2	20.6	22.1	23.5	24.9
Best case supply	17.2	21.1	21.1	21.1	21.1	21.1	21.1
Surplus/Deficit	0.9	3.3	1.9	0.5	-0.9	-2.3	-3.7
Aggregate Demand	16.3	17.8	19.2	20.6	22.1	23.5	24.9
Worst case supply	17.2	17.2	17.2	17.2	17.2	17.2	17.2
Surplus/Deficit	0.9	-0.6	-2.0	-3.4	-4.8	-6.2	-7.6