

77 Newcombe Road, Cambridge  
Economic assessment

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# Executive Summary

The Waikato region is one of New Zealand's largest regions by both population and land area. The region has experienced strong population and economic growth in recent years, with Hamilton as well as the surrounding towns such as Cambridge, growing significantly. The proposed Newcombe Road sand quarry sits within the geographic centre of the upper north island, which includes the high growth economic zone of the golden triangle encompassing Auckland, Hamilton, and Tauranga. As a result, the region contains significant infrastructure which connects its surrounding regions as well with the central and southern parts of the North Island. This means that Waikato is a key part of the New Zealand economy, and its relative performance is crucial. The Waikato covers a large area, with significant natural resource, including aggregate and sand. The proximity to other urban economies and transport infrastructure means that Waikato aggregate and sand are often exported to other regions, including Auckland and the Bay of Plenty.

Sand is an essential ingredient in concrete, and high quality sand is required for concrete applications. Concrete is used throughout the urban environment to meet the needs of residential, business and road construction requirements. Given the importance of concrete for the wider regional economy, it's built future is effectively reliant upon maintaining sustainable sources of sand.

## Demand outlook


Economic and urban growth needs access to high quality sand in good locations because it supports concrete production and keeps prices affordable. Sand is also used in non-concrete applications e.g., turf and sports fields and similar amenities associated with everyday life.

Official information about the volume of sand used, or extracted, is not available. But sand use can be estimated using secondary production data, specifically ready-mixed concrete volumes as published by StatsNZ. There are statistically significant relationships between population, ready-mix concrete and economic activities (GDP). We draw on these, and other, relationships to estimate current and future demand for sand. The per capita demand for washed sand in the Waikato-Bay of Plenty region is estimated at between 0.80 tonnes per year and 0.84 tonnes per year. This ratio is conservative because industry sources indicate the StatsNZ ready mix concrete volumes are under-estimated by 10 – 20%. The ratio includes fill sand.

Current demand in the Waikato-Bay of Plenty washed sand market is estimated at between 655,100 to 708,200 tonnes per year. This is likely to be an understatement because of current economic conditions and potential demand during the recent economic peak estimated more than 750,000 tonnes per year. Nevertheless, this conservative starting point is used. Using StatsNZ medium and high growth settings, the demand outlook is estimated.

A key consideration is that the Auckland sand market is currently adjusting to the loss of a key resource – the Pakiri sand resource consents were declined (the offshore consent is under appeal). This means that Auckland lost 38% of the saleable sand (based on 2021 sales data – 346,600 tonnes per year).

**A scenario approach is used to estimate future demand for sand. For the Waikato-Bay of Plenty market, the demand by 2048 is estimated to be between 793,500 tonnes per year and 951,400 tonnes per year.**



These changes are +21% to +34% greater the current levels. Adding an allowance respond to Auckland's pressures see these estimates increase significantly to between 1.0m to 1.2m tonnes per year (by 2048).

These changes are significant. These estimates are based on a business as usual approach with no extra allowance to accommodate a lift in infrastructure investment to address backlogs or lifts due to increases in new spending due to government programmes (e.g., Roads of National Significance).

The wider Waikato and Bay of Plenty regions are currently facing growth and investment pressures that are likely to continue in the future. Significant investment has been outlined in order to accommodate growth and address infrastructure deficits. The National Infrastructure Pipeline report produced by Te Waihanga Infrastructure Commission provides insight into planned infrastructure across the Waikato and Bay of Plenty regions. The infrastructure pipeline highlights the considerable forward-looking investment in infrastructure that has been committed to. This infrastructure spending includes significant road and transport spending that is programmed for the next decade or so.

The pipeline includes 577 funded projects with a total budget in excess of \$11.1bn, of which \$7.6bn are being implemented, with \$2.7bn of projects in planning and another \$0.7b worth of projects in procurement. Further projects in planning or procurement stages but where the funding source has not yet been identified, are valued at \$3.1bn. Examples of these projects include major roading projects for State Highways 1, 2 and 29, utilities upgrades, residential developments, reinstatement projects following Cyclone Gabrielle and ongoing development of infrastructure resilience. **This outlook underscores the solid demand for sand, as a key component of concrete, mortar, and asphalt as well as its general use in construction projects.**

### Supply outlook

Current sand supply information is limited and determining the levels and location of supply is difficult. New Zealand Petroleum and Minerals, a part of MBIE, publish the results of their annual survey on industrial rocks and minerals output. However, the sand data is not very usable because sand is not reported separately, and much of the data is suppressed due to confidentiality issues. We have used a combination of publicly available information and industry sources to form a view of the supply situation. There are several existing sand extraction sites within Waikato that supply the upper North Island markets. The consented volumes show the ***theoretical maximum market supply***, but this needs to be tempered by practical consideration, such as sand quality, location, and potential users.

The consented volumes appear concentrated around State Highway 1. Waikato-Bay of Plenty's sand resources reveal the following key dimensions:

- The weighted average consent expiry date across the consents is 2033.
- A significant share 47% (561,000 tonnes) of the existing consented volume will expire over the next 5-7 years.
- Three consents representing 525,000 tonnes (around 45% of the consented volumes) are near Cambridge.
- By 2029 consents totalling 375,000 tonnes will expire.

**This suggests that there is limited medium term (past 10-year) certainty in the market about future supply.**



**Potential sufficiency**

The estimated demand for sand is subtracted from the consented volumes. If demand exceeds supply, then a deficit is expected. Crucially, the consented volumes are the maximum volumes. Practical and real life considerations will mean that the usable sand is likely to be lower than reported. The figure shows the net position based on available consented volumes and timeframes with the addition of shares of Auckland demand. The figure shows the medium and high growth scenarios.

A surplus is currently experienced, but this will reverse within the next 6/7 years as economic demand returns and as consents expire. The deficit will continue to deepen if additional resources are not brought online.

While there is sufficient capacity in the sand market to address any short term pressures, the available information suggests that the supply surplus is expected to decrease to approaching deficit circa 2030 (depending on the scenario). If the economic recovery

takes hold and investment returns to higher levels, then the surplus will be drawn down sooner. In addition, the sand situation in Auckland is likely to have a strong influence on the Waikato sources, drawing resources away from local demand. This will accelerate the point at which a deficit situation will emerge.

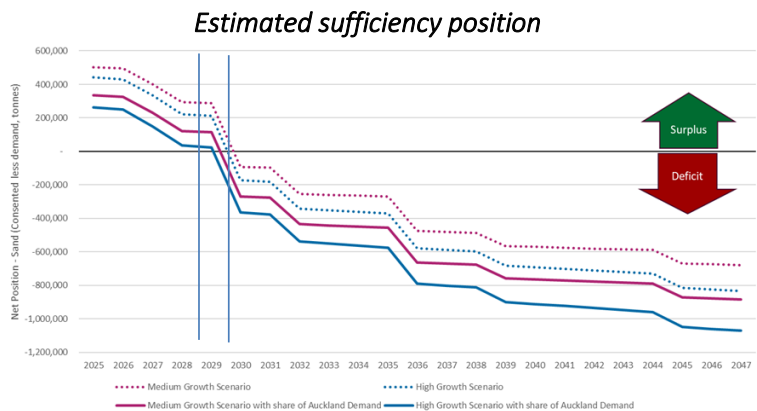
Enabling Newcombe Road extraction will add to the regional market’s sand supply options and will ensure that there is sufficient capacity in the sand supply. Even with Newcombe Road, the surplus position is projected to be maintained until 2030 before a deficit emerges – a key difference is the size (depth) of the deficit.

**The positive contribution that enabling Newcombe Road extraction will make is clear – the regional significance of enabling the resource is evident.**

The Waikato’s ability to grow and deliver infrastructure means that a sand deficit must be avoided. Enabling the Newcombe Road quarry is an economically suitable option because it would avoid the adverse economic effects associated with insufficient supply, examples of such effects include price increases, rationing and associated externalities.

**Significant benefits**

Enabling sand to be extracted from Newcombe Road to support the regional sand market will have direct benefits associated with construction as well as the effects associated with the amenity provided by that construction. Construction is regionally significant with a 7.1% contribution to GDP (\$2.3bn) and accounts





for 11.2% of employment, supporting 27,245 jobs<sup>1</sup>. However, the true benefits that enabling Newcombe Road sand extraction relates to the facilitated effects, i.e., it would support construction and underpin infrastructure delivery.

The sand market, and its functioning in the context of construction and infrastructure delivery, is regionally significant. Without sufficient sand, the market cannot operate efficiently, and infrastructure delivery will be constrained with adverse flow-on effects. Sourcing sand from alternative sites that are further from destination markets will increase:

- Direct transport costs,
- Emissions costs,
- Social costs.

Avoiding these costs can be seen as a benefit. Given the complexity of the market as a network of a number extraction sites and demand locations, there is no clear principal alternative to Newcombe Road especially with its potential production volume compared to other sites in the region. Therefore, the short-term and long term mix is used. The alternative reflects different combinations, including:

- Short term:
  - Sourcing sand from Titoki Sand for concrete sand, and sand for other applications from Pukekawa,
  - Sourcing sand from Revital for concrete sand, and sand for other applications from Pukekawa
- Long term:
  - Sourcing sand from Mercer.

The benefits associated with incorporating Newcombe Road sand into the Waikato-Bay of Plenty supply network will accrue over multiple years. These annual values are expressed in present value terms and discounted at 5%. The present value of the benefits (avoided costs) is estimated at:

- |                                 |                             |
|---------------------------------|-----------------------------|
| • Direct transport costs        | \$166.7m to \$168.7m        |
| • Environmental costs           | \$10.7m to \$11.1m          |
| ○ <i>Health related costs</i>   | <i>\$7.0m to 7.6m</i>       |
| ○ <i>Shadow price of Carbon</i> | <i>\$3.5m to \$3.7m</i>     |
| • Social costs                  | \$7.0m to 7.1m              |
| • <b>Total</b>                  | <b>\$179.5m to \$181.2m</b> |

To assist with understanding uncertainty, the costs associated with the Newcombe Road operation are estimated and an alternative (hypothetical) location is used. This is done by altering the relative distances associated with servicing Newcombe Road's anticipated markets; the approach mimics a shift to another resource that is located 5km to 23km from Newcombe Road.

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<sup>1</sup> Sourced from Infometrics' regional data.



The additional costs associated with these potential options are:

- +10% in total distance \$12.5m
- +25% in total distance 24.9mm
- +50% in total distance \$62.3m.

### Concluding remarks

The analysis shows that the region is likely to encounter a deficit in the short term as consents expire. Without new resources being developed, or the life of existing ones being extended, the region will not have sufficient capacity to support infrastructure investment and other sand users. The economic costs associated with such a deficit are significant. Servicing the demand using potential alternatives is difficult because there is limited certainty about the future availability of the resources. Without the Newcombe Road resource, there will be significant additional costs.



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# 1 Introduction

The Waikato region is one of New Zealand's largest regions by both population and land area. The region has experienced strong population and economic growth in recent years, with Hamilton as well as the surrounding towns growing significantly. The region covers the geographic centre of the upper north island, which includes the high growth economic zone of the golden triangle encompassing Auckland, Hamilton, and Tauranga. As a result, the region contains significant infrastructure which connects its surrounding regions as well with the central and southern parts of the North Island. This means that the Waikato is a key part of the New Zealand economy, and its relative performance is crucial.

The Waikato covers a large area, with significant natural resource, including aggregate and sand. The proximity other urban economies and transport infrastructure means that Waikato commodities are often exported to other regions, including Auckland and the Bay of Plenty.

In addition to the growth pressures associated with expansions, there are significant infrastructure deficits as well as maintenance demands. The Infrastructure Commission highlights the shortfall and suggests that a business as usual approach to renewals and investment will see the deficit grow. The historical deficit arose out of an investment slump some forty years ago, and the investment cycle during the 2000s. Despite these known issues, infrastructure investment still lags the required levels.

Construction is an essential part of infrastructure investment, and the entire supply chain must be efficient to ensure that infrastructure delivery can occur in a timely manner. A central message relating to addressing the infrastructure deficit is that a simplistic approach to building our way out of the deficit is unlikely to succeed. Instead, infrastructure efficiency, and maximising the return on infrastructure spending, are critical considerations. Estimates suggest that New Zealand's infrastructure spending would need to increase from 5.5% of GDP to 9.6% of GDP to deliver the infrastructure we need – a significant increase.

Sand is an essential ingredient in concrete, and high quality sand is required for concrete applications. Sand is a key component in the production of ready-mix concrete, with between 400 and 450 kilograms of sand in each cubic metre of concrete. Concrete is used throughout the urban environment to meet the needs of residential, business and road construction requirements. Given the importance of concrete for wider region economy, it's built future is effectively reliant upon maintaining sustainable sources of sand. Because sand is a key component in a range of different building applications, much of New Zealand's future productive growth is reliant on sand in one form or another. This means that the impact of sand extends significantly further than just the construction sector.

M.E has been approached to assess the economic effects of the proposed Newcombe Road sand quarry near Cambridge.

## 1.1 Objectives

Waikato's sand supply is dispersed across the region with several sand extraction operations making up the supplier market. The operations show considerable variation in terms of location, output size and sand quality. Given the Waikato's size and proximity to key markets and neighbouring regions, the region contains many suppliers relative to its own population while outside markets, such as Auckland and Tauranga, rely on Waikato suppliers to meet demand. This decentralised nature means the Waikato market must be considered in



conjunction with the wider Auckland and Bay of Plenty regions. The ability to source enough sand, from suitable locations to meet the needs of a wide market, is the key issue because it provides resilience and security of supply.

Access to suitable, and sufficient volumes of high-quality sand, from appropriate locations is critical. Sand is a high volume, low value commodity – transporting it from source to where it is used is adds significant cost to end products. Beyond the financial costs, environmental externalities also arise from transporting sand.

The objectives of this economic assessment are to:

- describe the local sand market and to illustrate the relative sufficiency position over time,
- summarise the costs and benefits of enabling sand extraction at Newcombe Road.

## 1.2 Information sources

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

- Information provided by RS Sand,
- M.E proprietary in-house regional economic dataset,
- Central government guidance and datasets:
  - Ministry of Transport,
  - New Zealand Transport Agency,
  - Ministry for the Environment,
  - StatsNZ.
- Industry sources and releases,
- Public sources, such as Inside Resources.

## 1.3 Structure

The balance of this report is structured as follows:

- Section 2 describes the market growth outlook, specifically demand for sand and the supply situation. The net position of the regional sand market is highlighted, and the economic implication of the net position is outlined.
- Section 3 draws on the analysis and summarises the potential economic effects of the sand supply-demand outlook, and how the Newcombe Road operation would assist in avoiding costs (delivering benefits).
- Section 4 provides concluding remarks.



## 2 Sand market and outlook

Economic and urban development and expansion, meaning that the ability to cater for increases in population and economic outputs relies on and directly linked to the sustained availability of sand, especially concrete sand. Sustaining GDP growth and economic performance, as well as catering for household growth, requires continued access to sand of appropriate quality and quantity, in an accessible location. Ensuring local sources of sustainably quarried sand ensures it can be provided to market at a cost-effective price.

The immediate benefits of high quality infrastructure are:

- Hard infrastructure requires concrete, and these investments include economic assets such as roads, bridges, ports, and railways. It is critically important to ensure that the infrastructure supports and improves the efficiency of moving goods, people, and information. If sand is not available, and infrastructure cannot be delivered in a cost-efficient or timely manner, then this will lead to cost/budget increases, travel delays and disruptions, long travel times and productivity losses for both individuals and businesses. Overall, these impacts reduce welfare standards.
- Infrastructure enables trade by reducing transaction costs between local boards, and the other regions. These connections stimulate and support growth.
- Well-developed infrastructure attracts domestic and foreign investment. The investment case is stronger for regions with reliable and robust transportation, communication, and energy network.
- Infrastructure investments in areas such as healthcare, education, and three waters contribute to improving the quality of life. This, in turn, enhances productivity, innovation, and economic competitiveness.
- Infrastructure investments can enhance resilience to natural disasters, climate change, and other shocks. For example, flood defences can reduce the economic costs associated with disruptions and damages. In addition, addressing damage after an event requires a strong supply chain, with an ability to access raw materials and processing capacity from diverse sources.
- Infrastructure projects often have long-term benefits that extend beyond immediate economic gains.

Sand is a direct input into the construction sector, enabling investment in projects delivering significant regional benefits. Catering for growth requires investment in infrastructure.

This section starts with a summary of key parameters describing the sand market. These parameters are then applied to illustrate the demand outlook for Waikato and the Bay of Plenty. A short commentary about the sand-market in Auckland is included to highlight the pressures and sand supply crunch that is unfolding. The local demand-supply position is also described.

### 2.1 Demand patterns

Official information about the volume of sand used, or extracted, is not available. Sand is used in concrete applications and demand for sand can be derived from concrete data. StatsNZ publish regional ready-mixed concrete volumes. In this data set, Waikato and Bay of Plenty are published as a combined region. In addition, there are statistically significant relationships between population, ready-mix concrete and economic activities



(GDP). The relationship between sand and concrete is fixed and can be used to express sand demand on a per capita basis. The revealed per capita (concrete) sand demand is:

- 5 year average           0.39 tonnes per capita,
- 10 year average        0.38 tonnes per capita,
- 20 year median         0.36 tonnes per capita,

Despite disruptions such as the Global Financial Crisis (GFC) and the Covid-19 lockdowns, construction activity has been robust. However, the current economic slowdown is showing up in the data with lower consents and building activities. It is important to look through these short term fluctuations to consider the medium and long term patterns.

The GFC led to a period of low investment in infrastructure and capital assets, causing demand for concrete to slow. During this period, per capita demand for concrete sand dropped from a ratio of 0.43 tonnes per capita in 2008 to 0.32 in 2009 and reaching a low of 0.26 in 2012. Post-GFC, demand for concrete remained relatively flat until 2014, when a clear upswing became noticeable as the economy regained momentum.

The significant disruptions during the Covid-19 pandemic are also evident in ready-mix data – the lockdowns as evident in the data, but so too is the significant upswing due to pent-up demand coming out of the lockdowns. Currently, the slowing business cycle is reducing demand, but the construction pipeline remains positive looking forward.

Sand also has other uses in landscaping, industrial applications, turf and golf, and equestrian activities. In contrast to the Auckland market, in the Waikato and Bay of Plenty markets, sand is also used for fill and drainage applications. Waikato sand needs to be processed before it can be used for some applications. This is to remove impurities and to ensure that homogenous inputs are used. This means that the amount of sand that is quarried is greater than the sand used in concrete production. The general ratio that is used suggests that for every 1 tonne of (usable) concrete sand, 1.25 tonne of sand must be quarried and process. The balance is used as part of fill sand and forms part of overall fill sand supply. The relative proportion of sand use across the different sub-markets are based on information to M.E and are as follows:

- Concrete sand           35% to 44%
- Washed sand/fill       14% to 19%
- Fill/Pit sand            38% to 51%.

These figures suggest that, in simple (round) terms, the quarried sand is applied to concrete and fill applications in the 50:50 basis, with the 80% of the concrete sand portion available for use once washed. The balance is used in the fill/pit sand market.

Therefore, the overall per capita demand from all applications in the Waikato-Bay of Plenty concrete region, including non-ready-mix concrete, is estimated as follows:

- Lower estimate: 0.80 tonnes per capita
- Higher estimate: 0.84 tonnes per capita.

Industry sources indicate the Statistics New Zealand Ready Mix Concrete volume is under-estimated by 10 – 20%. Therefore, the ratio based on the StatsNZ ready-mix information is likely to understate total demand. A conservative posture is maintained, and the above ratios are used without any further upward adjustment. These demand ratios provide a solid foundation for projecting both current and future demand patterns.

The current demand levels for sand in the Waikato / BoP are estimated at:

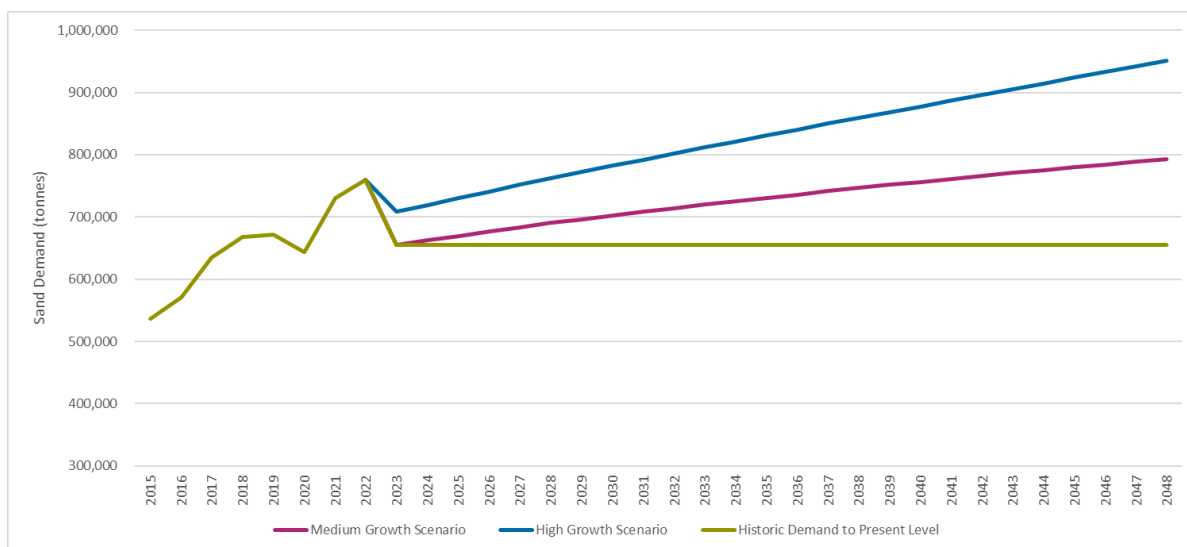
- Ready-mix concrete sand:
  - Estimated at between 291,000 tonnes and 314,000 tonnes.
- Other applications:
  - Estimated at between 363,980 tonnes and 393,400 tonnes<sup>2</sup>.

These estimates suggest that current annual demand for washed sand in the Waikato-Bay of Plenty market is in the order of 655,000 to 708,000 tonnes. These estimates are below the peaks seen immediately after the Covid-lockdowns when pent-up demand was in the system. The current levels are broadly in-line with the patterns experienced in the 2016/17 period when the economy was growing, but before the very strong growth period seen immediately before Covid. Therefore, current demand levels are likely to understate baseline demand levels.

The growth outlook is presented using two scenarios and the results are shown in Figure 2-1. The scenarios reflect:

- the medium population projections,
- the high population growth settings.

Figure 2-1: Waikato-Bay of Plenty Demand for sand - outlook



The demand outlook for sand in the Waikato-Bay of Plenty markets is positive, and is projected to grow under both two scenarios. The shift in demand is considerable and by 2048, the annual increase in demand is estimated as follows:

- The additional washed sand (concrete) that will be demanded (per year), is estimated at around 76,800 tonnes to 135,100 tonnes per year, with the overall demand at around 793,450 tonnes to 951,370 tonnes per year by 2048. The range reflects different population growth assumptions.

These changes are substantial, representing a percentage change from current levels of between +21% to +34%. Based on the current growth pathway and sand use patterns, production levels will need to increase by a significant level to ensure that there is sufficient capacity to support regional growth.

<sup>2</sup> This includes the portion of washed sand that is used for fill (and the balance of sand processed for concrete sand).



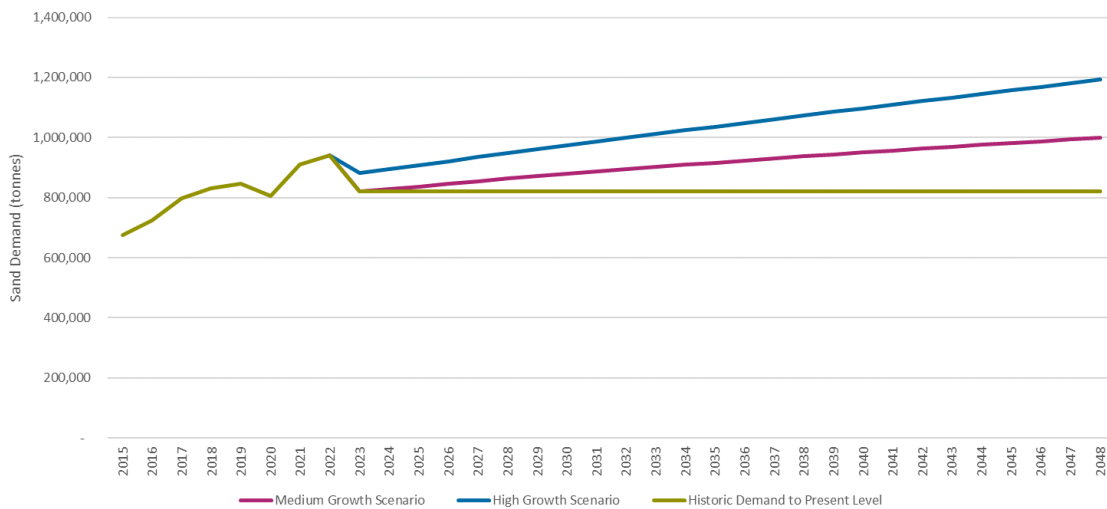
**Pressure on Auckland sand market**

The above demand outlook does not consider the potential shifts in the Auckland sand market associated with recent consenting activities. The Pakiri marine sand consents were refused, and one is currently under appeal. These resources accounted for 38% of market sales (346,600t in 2021). While other resources could be accessed there are technical barriers to such a response. Sand from the Kaipara is seen as the principal alternative, but the consents associated with this resource expire in 2027 – three years. Industry sources (anecdotal) indicated that Auckland came close to running out of sand in December 2023, and again in February 2024. This suggests that the current economic slowdown is masking the acute pressures that Auckland is facing.

Auckland’s sand market is facing uncertainty and one potential response could be import sand from Northland or the Waikato to fill any shortfalls. While an expensive alternative, it is not unrealistic because Auckland already imports over 4m tonnes of aggregate every year from the Waikato and Northland.

The demand outlook is adjusted upwards to reflect a wider perspective, i.e., one where Waikato washed sand is also used in Auckland. For this, simultaneous projections for Auckland demand were created with the same methodology. The Auckland inclusive settings include a 15% share of Auckland demand to the demand of the Waikato-Bay of Plenty market. This share equates to approximately 131,000 tonnes – equal to 38% of the actual sales volumes that needs replacing in the absence of Pakiri sand. In addition, other minor shifts associated with the catchment areas are included. Figure 2-2 illustrates the demand outlook if a portion of Auckland demand is serviced using Waikato sand.

Figure 2-2: Waikato-Bay of Plenty Demand for sand with a share of Auckland Demand - outlook



This adjustment increases future demand estimated by between 206,000 tonnes per year and 241,000 tonnes per year. Given the strong growth Auckland is projected to experience in the future, this creates further demand pressure. The projections indicate that by 2048, demand for Waikato-Bay of Plenty sand is between 1m tonnes per year and 1.2m tonnes per year.

These demand scenarios do not show any upward change in concrete demand which is due to:

- Increased maintenance spending on infrastructure e.g., additional three water spending or roading infrastructure (bridges, culverts and so forth).
- Increased spending arising from central government’s investments in Roads of National Significance.



The ability of the market to deliver sufficient sand is crucial. The supply patterns are a function of appropriate sand (quality) and location.

## 2.2 Supply patterns

Sand is one of the worlds most consumed raw materials. Globally, 40 to 50 billion tonnes of sand are extracted per year for use in construction, primarily to make concrete. Global use rates have tripled over the last two decades in response to urbanisation and associated infrastructure spending.

Most sand for concrete needs to be sourced from either the sea, from rivers, or from relict river or dune deposits. This is because the grains do not have all their edges eroded away, meaning that the sand binds better with cement to make stronger concrete. Sand that is wind eroded – such as that found in deserts – has a much rounder profile, meaning it is not suitable for making concrete. In the New Zealand context, the choices are narrower. Due to the continued eruptions from the silica rich andesitic volcanoes of the central North Island, the river sands north of Taupo have high levels of alkali reactive minerals and pumice. This means that once sand is extracted it must be washed to be used for concrete manufacturing and civil construction, resulting in useable volumes for concrete sand which are generally less than the consented volumes. Within the Waikato market the primary source typology for sand is from land based sources with some of the sand extracted from river-based sources.

The current sand supply information is limited and determining the levels and location of supply is difficult. New Zealand Petroleum and Minerals, a part of MBIE, publish the results of their annual survey on industrial rocks and minerals output. However, the sand data is not very usable because diverse categories are aggregated (e.g., industrial rock production are mixed with sand and aggregates) and in other cases the data is suppressed due to confidentiality issues.

To aid in developing a picture of the sand supply situation, publicly available information as well as information supplied by industry sources were combined to form a view of the supply situation. The information includes:

- locations,
- operators,
- stated consented volumes, and
- consent expiry dates.

This data is not free from limitations because some records are incomplete. Missing datapoints include:

- consented volumes
- expiry dates
- actual useable volumes that could be accessed if consents are granted.

There are several existing sand extraction sites within Waikato that supply the upper North Island markets. Table 2-1 offers a basic summary of Waikato-Bay of Plenty's key sand sources.

The table reports consented volumes. This reflects the *theoretical* market supply, but this needs to be tempered by practical consideration, such as:

- Sand quality,
- Practical and logistical considerations,
- Existing allocations,
- Location relative to the end-users.



Table 2-1: Waikato-Bay of Plenty Sand Sources

Source	Operator	Consented tonne	Estimated Expiry
Titoki	Winstone Aggregate	250,000	2029
Tuakau*	Stevenson and sons	180,000	2038
Monovale	PRF and partners	150,000	2031
Cambridge	Revital Sand	125,000	2029
Pukekawa*	Winstone Aggregate	129,000	2046
Papamoa	Fulton Hogan	100,000	2027
Matamata	Macpherson Contractors	100,000	2035
Cambridge	Will Hjorth	100,000	2035
Ngahinapouri	Coombes Farms Ltd	86,000	2026
Matamata	Wilson Sand	75,000	2045
Atiamiri	Atiamiri Sand and Pumice	35,000	2045
Maungatautari (consent application)**	Beacon Hill Contracting	95,000	2045
Others with limited information: Kaipaki Road, Rukuhia Sand, Paeangorao, Thornton Sand and Mercer Sand		Unknown but mostly for pit sand (275,000 tonnes) and limited (45,000 tonnes) for concrete sand.	Unknown

\* Also Supplies Auckland market.

\*\* Beacon Hill was operating without consent and is currently seeking consent for 95,000 tonnes for 20 years.

The consented volumes – as well as extraction sites – are spread across the Waikato with some concentration around the central areas along the Waikato River and those located close to State Highway 1. The current sand supply is diversified across a number of suppliers, with several suppliers with individual consented volumes of between 100,000 to 250,000 tonnes. Some of the operations (e.g., Tuakau and Pukekawa) are already supplying the Auckland market and industry sources suggest that around half of these two resources are used in Auckland’s concrete and turf markets. With growing demand pressures in the Auckland market, a further shift away from the Waikato market can be expected.

Waikato-Bay of Plenty’s sand resources reveal the following key dimensions:

- Consented total volume of sand is estimated at 1.2 million tonnes across the Waikato-Bay of Plenty – the theoretical maximum capacity (crucially, the consented volumes do not translate into usable or saleable sand which is likely to be lower and based on aspects like processing infrastructure capacity and so forth)<sup>3</sup>.
- Consented volume of washed sand (concrete sand) is estimated at approximately 530,000 tonnes per year.
- The Pukekawa and Tuakau resources are included in the estimate even though the future availability of these resources to the Waikato market is unlikely.

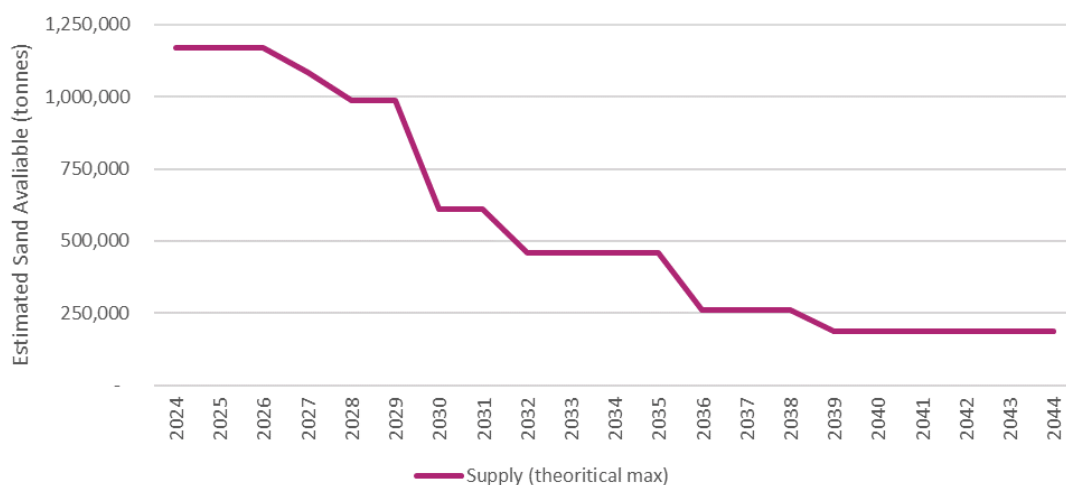
<sup>3</sup> Including the unconfirmed and unconsented sources, suggest that total theoretical maximum could be in the order of 1.6m tonnes per year.



- The market is well dispersed across several sites with most operating at a relatively small scale relative to the overall market. Of the consented sites presented above, Winstone Aggregates’ Titoki site was the largest, with a consented volume of around 21% of the Waikato-Bay of Plenty market supply, 24% of the washed sand market (for concrete sand). Even if the unconfirmed and unconsented volumes are included, the relative concentration in the market is evident (15% of consented volume, and 22% of the concrete sand is associated with one source). Crucially, the Titoki resource consent expires in the next 5 years.
- The consented volume does not include adjustments for sand processing, infrastructure and logistic constraints and market realities. The useable volumes could be significantly lower than consented volumes.
- The total consented volumes as reported in the preceding point does not include Beacon Hill Contracting’s Oreipunga Sand Quarry. While the site had been supplying pit sand without consent and it currently applying for a 20 year consent for 95,000 tonnes per year. Therefore, caution is needed when considering the total market because this unconsented source accounts for 6% of consented volume.

Figure 2-3 shows the timeline and future availability of sand based on current consented volumes and expiry dates. It is essential to note that the figure shows the theoretical maximum sand that is available. Practical considerations, such as infrastructure availability and owner intentions, are likely to limit actual usable quantities.

Figure 2-3: Consented Volumes (theoretical maximum)



The weighted average consent expiry date across the consents is 2033. A significant share of the existing consented volume will expire over the next 5-7 years. By 2030, the consented volumes will be down to 610,400 tonnes – a 47% decrease (or a loss of 561,000 tonnes). This shift is significant downward shift.

Three consents representing 525,000 tonnes (around 45% of the consented volumes) are near Cambridge:

- Titoki sands
- Monovale sand, and
- Revital sand.

Industry sources suggest that these quarries are operating near their consented maximums, and there is limited scope to increase output. This means that the opportunity to address growth pressures (additional



demand) from these quarries is limited. Additionally, within the Bay of Plenty sites supplying Tauranga from Papamoa and Paengaroa are also set to see their consents expire over the short term.

A consented volume of around 561,000 tonnes is currently supplied by sites with consents expiring within the next decade. Most of this volume is made up of the 2029 expiry of the key consents of Titoki Sand and Revital which combine for around 375,000 tonnes.

Of the listed consents, only three consents have expiry dates past 2044, these have a combined volume of 239,000 which accounts for 18% of the total market's current consented volume. This includes the Pukekawa resource that is likely to see its volume flows transition to Auckland in the short to medium term. **This suggests that there is limited certainty over the medium term (past 10-year) regarding supply.**

The future reduction in supply levels will mean that in the short to medium term, sand will need to:

- be imported from other regions, such as Taranaki or Manawatu-Wanganui,
- existing operations need to increase production levels (with consents renewed),

However, addressing the shortfalls via existing operations would require operations to substantially scale production up. Alternatively, sand could be imported from neighbouring regions such as Auckland and the Bay of Plenty. However, the Waikato already exports sand to Auckland and the Bay of Plenty. Importing sand from Hawke's Bay, Taranaki or Manawatu-Wanganui would see sand transported considerable distances (e.g., the equivalent of moving sand from further than Taupo – the financial and environmental costs and practical considerations (logistics) will prohibit such an option.

Significant pressures on sand supply will become evident and constrain construction activity as soon as the economy picks back up, with demand increasing prices. Establishing a new quarry is a third alternative in this case. This would avoid the direct and consequent economic effects associated with transporting sand vast distances.

The analysis shows that almost half (47%) of the consented volumes will expire by 2030 – some of these consents could be renewed, but renewal is not certain because the quarrying activity could be at the end-of-life.

Manufactured sand is frequently mentioned as a potential substitute for natural sand. Introducing a new product to the market typically involves rigorous testing to ensure it meets all necessary standards and to identify any limitations or nuances. Some proponents (e.g., KayaSand) of manufactured sand have been active since 2007 and others are testing technology prototypes. However, there is limited evidence of widespread market adoption of manufactured sand as a mainstream alternative to natural sand. There are no clear market signals indicating that users are widely accepting this new technology, meaning that manufactured sand remains a speculative option. In addition, manufactured sand needs a suitable aggregate source. Manufactured sand is normally blended/mixed with natural sand to achieve the required attributes. The next section presents the demand growth and overlays the consented volumes.

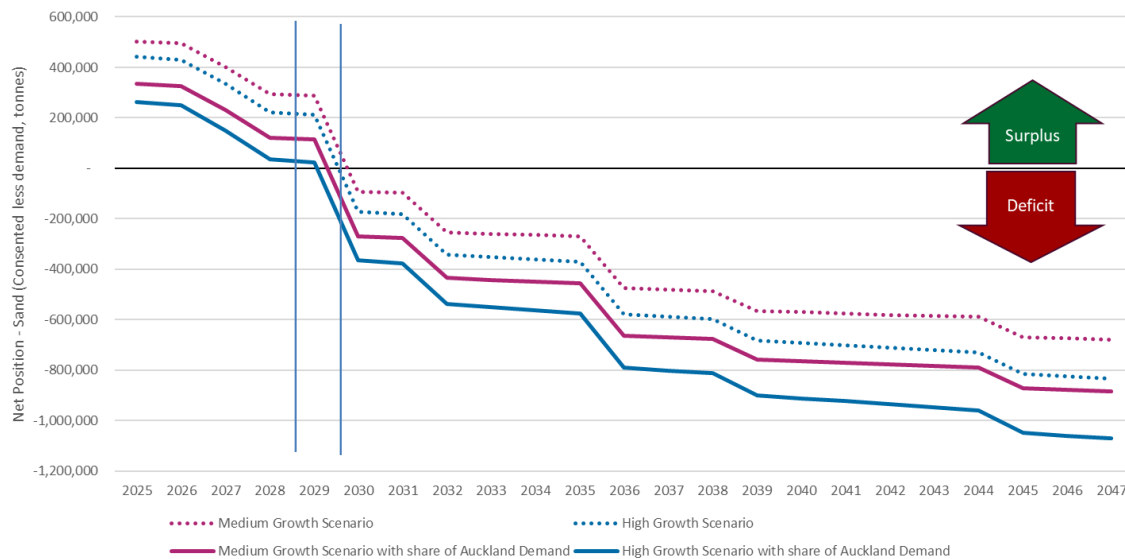
## 2.3 Sufficiency position

The net position illustrates the net situation with the estimated demand for sand subtracted from the consented volumes. If demand exceeds supply, then a deficit is expected. Crucially, the consented volumes are the theoretical maximum volumes. Practical and real life considerations will mean that the usable sand is

likely to be lower than reported. For example, ash, silt, and pumice content will reduce how much of the resource can be used for concrete applications.

Figure 2-4 shows the position of the Waikato-Bay of Plenty market based on the existing available consented volumes and timeframes with the addition of a share of Auckland demand. The figure shows the medium and high growth scenarios. It also shows the relative sufficiency if the potential demand shift towards Auckland is excluded.

Figure 2-4: Sufficiency Position (theoretical maximum supply)



Based on historic sand demand levels, the existing situation where there is sufficient washed sand to meet demand in the Waikato is expected to remain the case over the short term until consents start to expire. However, the outlook suggests that this is a short term situation that quickly reverses as consents expire in the next 4-6 years. A supply shortfall is expected within the next decade even if the Auckland situation is ignored (see Appendix 1). **The deficit will continue to deepen if additional resources are not consented and progressed.**

The effects of the current economic slowdown and below long term trends for construction and investment are masking the magnitude of the surplus. As the economy recovers, price inflation normalises (returns the Reserve Bank’s target range) and interest rates are lowered, an upswing in construction and investment will likely occur. The modelling suggests that there is sufficient capacity based on current economic activity and population levels. However, comparing the demand-supply situation based on economic activities immediately post-Covid, as well as the economic slowdown suggests that current demand levels are between 52,000 tonnes to 105,000 tonnes below the peak levels<sup>4</sup>. If these high points are considered as demand over the short term, then the potential deficit position is reached and surplus position is overstated by these amounts. As economic activity and investment patterns return, demand for sand is expected to increase and short term pressures will emerge if additional sand is not made available to the market.

<sup>4</sup> These observations are consistent with anecdotal evidence that suggests that during the peak period (post Covid), that there was around 100,000 tonne available capacity.



Regardless, even with the economy and demand levels growing of a low base, the surplus is expected to decrease from 2028, before falling into a deficit position and gradually entering a supply deficit from 2030 based on existing consent volume. If the economic recovery takes hold and investment returns to higher levels, then the surplus will be drawn down sooner.

The potential/emerging role of Waikato sand to the Auckland and Bay of Plenty markets underscores the resource’s regional significance.

Enabling Newcombe Road extraction will add to the regional market’s sand supply options and will ensure that there is sufficient capacity in the sand supply. This will provide supply chain resilience, while supporting efficient market operation. Figure 2-5 illustrates the net position with Newcombe Road enabled.

Figure 2-5: Sufficiency with Newcombe Road Enabled



Excluding the Auckland demand, the additional sand associated with Newcombe Road is projected to keep the market in surplus until 2031/2032 (depending on the growth scenario). Under the scenarios with a share of Auckland demand serviced from Waikato, the surplus position is projected to be maintained until 2030, with the spread showing the medium to high growth situation.

The positive contribution that enabling Newcombe Road extraction will make is clear – the regional significance of enabling the resource is evident. **Further, the wider context of Auckland’s importance in the New Zealand context, i.e., it’s the largest economy with 38% of GDP, it can be argued that enabling Newcombe road will support nationally significant activity.**

Supporting regional economic activity is critical. Sand is used across key parts of the economy and without sufficient sand, adverse economic effects arise. Importantly, the sufficient supply means that there should be enough sand, in suitable locations and of the appropriate quality. In addition, to ensure that the market can operate efficiently, a supply buffer is needed. For example, the National Policy Statement on Urban Development (UPS-UD) requires an additional margin of 20% over the short and medium term, and 15% over the long term when assessing housing sufficiency. Adding such a margin to total sand requirements means that a deficit position will emerge within the next 3-5 years. Even if the regional role is ignored and the Auckland demand is excluded, a deficit position is anticipated in less than 10 years.



The Waikato's ability to grow and deliver infrastructure means that a sand deficit must be avoided. Enabling the Newcombe Road quarry is an economically suitable option because it would avoid the adverse economic effects associated with insufficient supply. An avoided cost is viewed as a benefit. Examples of the potential adverse effects include:

- **Price increases:** One of the immediate consequences of a supply-constrained market is the rise in prices. Sellers can hike prices in response to high demand because usual competitive pressures are overridden. These price increases then cascade into other related goods and services, creating upward price pressures throughout the value chain. In the context of the sand market, any increase in price will be reflected in construction costs, including all infrastructure-related expenditures that will result in increased rates and taxes. As a result, these price hikes further constrain available budgets, this means that available funding does not deliver as much value as in a 'with sufficient sand' situation.
- **Rationing:** Sellers might manage supply constraints by rationing sand among clients. This could mean prioritising higher-value or priority clients, leading to some clients missing out, having to accept higher prices, or resorting to using inferior products, or not undertaking planned projects.
- **Shifting demand patterns:** Persistent shortages might prompt exploration of alternatives and shifts in demand patterns. For sand, this could involve using manufactured sand or sourcing from suppliers from other regions. However, specialised applications have stringent requirements, making it challenging to switch suppliers. Additionally, the high cost of transporting sand directly impacts the final delivered price.
- **Opportunity for new suppliers:** High demand relative to supply can create market opportunities. Potential responses include expanding existing operations, investing in additional equipment to increase output, or establishing new operations. However, these responses are often difficult to implement and take time due to the regulatory processes around sand quarrying or extraction, which present high barriers. Over time, these efforts could lead to increased competition, helping to alleviate shortages. RS Sand's efforts to develop the Newcombe Road resource are an example of this market effect.

The flow on effects, across the rest of the society due to cost increases are also noteworthy. Social amenities such as golf courses, and sports facilities are cost sensitive and increasing costs could render them unviable, leading to closures. These community assets make economically measurable contributions and losing them reduces community wellbeing. Having access to sufficient and cost effective sand to support construction and other activities is essential to avoid direct and indirect costs.

## 2.4 Conclusion

Enabling Newcombe Road sand extraction will add a sizable resource to the Waikato-Bay of Plenty sand market. The amount will be available to the market at a crucial time when existing operations are nearing the end of life and end of consented period. Adding to the available sand is crucial and will assist in alleviating pressures on the market's supply. It will also underpin investment confidence and the ability to provide more robust project pricing/budgeting.

Sand is an essential input into a wide range of applications that are critically important to everyday life. The Waikato-Bay of Plenty sand market has generally operated in a supply surplus. However, based on the anticipated consent expiry timeframes, a deficit situation is expected in the near term. The current economic



slowdown and low growth environment is likely to mask the true state of demand and emerging growth pressures.

## 3 Significant benefits

Enabling sand to be extracted from Newcombe Road to support the regional sand market will have direct benefits associated with construction as well as the effects associated with the amenity provided by that construction. Construction is regionally significant with a 7.1% contribution to GDP (\$2.3bn) and accounts for 11.2% of employment, supporting 27,245 jobs<sup>5</sup>.

However, the true benefits that enabling Newcombe Road sand extraction relates to the facilitated effects i.e., it would support construction, and underpin infrastructure delivery.

As indicated in the preceding section, the Waikato-Bay of Plenty sand market is complex, with supply from several sites across the region to meet a large share of demand in the Waikato, Bay of Plenty and Auckland. The pressures will become more acute as resource shortages intensify. This is also due to increasing regulatory aspects that mean that past consents are not renewed, and applications are denied.

The Newcombe Road resource offers an opportunity to deliver sand to the markets. Using this resource offers an ability to supply sand to the regional market in a way that not only satisfies demand, but it also reduces emerging market pressures by ensuring medium term sufficiency in a regional context. As a result, the quarry can do so in a way that delivers a range of wider economic benefits.

The sand market, and its functioning in the context of construction and infrastructure delivery, is regionally significant. Without sufficient sand, the market cannot operate efficiently, and infrastructure delivery will be constrained with adverse flow-on effects. At the same time, if the sand is sourced from alternative sites which are further from the points of demand, then the transport function adds other costs, such as:

- Direct transport costs,
- Emissions costs,
- Social costs.

Avoiding these costs can be seen as a benefit. The relative benefits of using the Newcombe Road resource are that the transport function avoids significant emissions, and these can be quantified and expressed in monetary terms.

Given the complexity of the market as a network of a number extraction sites and demand locations, there is no principal alternative to Newcombe Road especially with its potential production volume compared to other sites in the region.

This section provides an indication of the potential scale of the costs that would be avoided if Newcombe Road is enabled.

### 3.1 Infrastructure investment

New Zealand's infrastructure challenges are well-documented. Supporting population and economic growth will require ongoing investment to cater for that growth. At the same time, legacy issues must be addressed, and resilience must be built into the infrastructure landscape.

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<sup>5</sup> Sourced from Infometrics' regional data.



An NZTA report noted there has been a deficit in infrastructure re-investment for the medium term which, when coupled with strong population growth, means that much public infrastructure is coming to the end of its useful and/or economic life<sup>6</sup>. Combining the historic shortfalls with growth means that the demands on infrastructure investment are likely to become even more acute over the short-, to medium terms.

The investment pipeline shows the size of the infrastructure challenge. There are many large-scale infrastructure projects that will generate considerable demand for concrete, and therefore concrete sand. The National Infrastructure Pipeline is produced by Te Waihanga and is a compilation of infrastructure project information collected from many contributing organisations. The pipeline report provides insight into planned infrastructure projects across NZ and can be filtered to select specific areas. Selecting the Waikato and Bay of Plenty regions:

- returns 577 funded projects,
- points to planned spending of \$11.1bn<sup>7</sup>, of which:
  - \$7.6bn are being implemented,
  - \$2.7bn of projects in planning, and
  - \$0.7b worth of projects in procurement.

Further projects in planning or procurement stages but where the funding source has not yet been identified, are valued at \$3.1bn.

The infrastructure pipeline highlights the considerable forward-looking investment in infrastructure that has been committed to. This infrastructure spending includes significant road and transport spending that is programmed for the next decade or so. This outlook underscores the demand for sand that can be used in roading projects, as well as other projects associated with drainage, foundation and base layers and similar construction projects.

High-profile projects of a large scale that are in the pipeline include:

- **State Highways 1, 2 and 29:** The Waikato-Bay of Plenty contains several key roads which form a crucial component of New Zealand's economy. A number of roading projects have been outlined under the Roads of Nation Significance such as:
  - SH1 Cambridge to Piarere,
  - Hamilton Southern Links,
  - SH29 Tauriko West and
  - the Takitimu North Link.

The existing roads require ongoing maintenance and renewals which adds up to a significant amount of activity.


- **Te Maunga Wastewater Treatment Plant Programme:** Tauranga City Council have outlined multiple projects surrounding the wastewater treatment plant with a project value range of between \$250 to \$500 million, with work expected to begin in 2029. This project is reflective of the infrastructure needs of catching up with and supporting population growth. As urban centres across the Waikato and Bay of Plenty regions continue to grow, ongoing investments in wastewater, as well as other three-water infrastructure pieces are needed.
- **Wairakei Ring Phase 2:** This project arises from Transpower's further investment in generation in the Bay of Plenty causing constraints on the Wairakei Ring A line. The reinforcement to capacity is likely

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<sup>6</sup> <https://www.nzta.govt.nz/assets/resources/research/reports/693/693-aggregate-supply-and-demand-in-new-zealand.pdf>

<sup>7</sup> Based on the class mid-values.





to include reconductoring or a new transmission Line. The project has an estimated value range between \$250 million - \$500 million with an estimated completion in 2030.

- **Other example projects/developments include:**
  - Peacockes residential development in Hamilton
  - Growth in Cambridge, Te Awamutu and Kihikihi as identified by Waipā District Council<sup>8</sup>
  - Ongoing retirement village developments in Cambridge
  - Civic Centre Redevelopment in Tauranga
  - Omokoroa development (near Tauranga, in Western Bay of Plenty)
  - Significant intensification development in Tauranga
  - Ongoing roading infrastructure and three waters infrastructure reinstatement following Cyclone Gabriele in the Coromandel and Western Bay of Plenty
  - Ongoing infrastructure spend to develop infrastructure resilience.

In addition to the very large items listed above, various public bodies and agencies have numerous ongoing and planned projects to improve the regions.

## 3.2 Avoided costs are benefits

Transporting sand is expensive, with costs directly linked to distance. Industry information indicates that to move a tonne of sand 1km along the road network costs between 30 and 40 cents. Clearly, the greater the transport distance, the higher the transport costs and the delivered value of sand. If sand is sourced from a location that is further from the market than the alternative location, then additional costs are introduced – reducing overall efficiencies. Transporting sand further has an immediate impact on the delivered cost, and therefore infrastructure budgets.

The destination markets are based on information provides by RS-Sand with the following key destination markets (relative shares) used:

- Hamilton/Cambridge 48%
- Tauranga 25%
- Waikato 11%
- Rotorua/Taupo 7%
- Rest of Bay of Plenty 7%
- Coromandel 2%

The transport distances are estimated from the Newcombe Road site to central locations in the destination markets. Similarly, the distances for other main quarries as well as potential alternative sources near Mercer are estimated.

The alternative reflects different combinations, including:

- Short term:
  - Sourcing sand from Titoki Sand for concrete sand, and sand for other applications from Pukekawa,

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<sup>8</sup> [Cambridge Growth - Waipa District Council \(waipadcc.govt.nz\)](https://www.waipadcc.govt.nz/) and [Te Awamutu and Kihikihi Growth - Waipa District Council \(waipadcc.govt.nz\)](https://www.waipadcc.govt.nz/).

- Sourcing sand from Revital for concrete sand, and sand for other applications from Pukekawa.
- Long term:
  - Sourcing sand from Mercer.

Considering the uncertainties, a separate analysis is included to show the cost increases if distance (relative to Newcombe Road) increases by 10%, and 25%.

There is uncertainty around how sand suppliers would respond in the face of the deficit and growing supply pressures, and Auckland’s short falls. They could increase production (within consented limits if available) until the relevant consents expire. Alternatively other quarries could open. To illustrate the anticipated cost changes, these potential responses are combined with the short term (5 year) period seeing a lift in existing production and the long term seeing a transition to the Mercer resource.

The direct transport costs, as well as the wider externalities are discussed below. The externalities are emissions costs and social costs. The emissions costs capture shadow price of carbon as well as the health effects of road transport emissions. The social costs of accidents are also estimated.

The evaluation considers a 25 year period and future Dollar values are expressed in current terms using Discounted Cash Flow analysis (DCF). The default discount rate of 5% is applied. The annual values and discounted values are reported.

### 3.2.1 Direct transport costs

The distance sand is transported has a direct bearing on the delivered price<sup>9</sup>. Using the Newcombe Road resources, instead of the alternative sand combinations to meet demand will avoid direct transport costs estimated at \$8.0m per year for per year till 2029, before increasing to \$13.3m per year in 2030 as the closer Titoki Sands consent expires and is replaced by sand sourced from Mercer. The long term costs are significant and equates to the price increase of \$42/tonne – for the transport costs. At this transport price, the cost of delivered sand will increase materially. There is some variance in sand contracts based on volumes, duration and distance, but the implied additional transport costs will almost double on a per tonne basis (in Auckland the price of delivered sand is in the \$40/tonne - \$45/tonne range).

The additional costs that will be incurred by sand users over a 25 year is:

- Additional from Titoki + Mercer + Pukekawa                      \$168.7m
- Additional from Lemington + Mercer + Pukekawa                \$146.4m.

Enabling Newcombe Road will avoid significant direct transport costs relative to the alternatives. These saving arise because the need to transport sand over land is reduced i.e., a more efficient transport network used to supply sand to end-users. Other benefits that arise from enabling a lower-cost provider include:

- Lower sand prices reduce, or at least suppress, the concrete price component of infrastructure project budgets.
- Extra competition ensures that the market remains efficient.

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<sup>9</sup> If the distances decrease, then a cost saving occur (this is integrated into the modelling).

- End users have wider choice in terms of sand supply options. This supports competition and helps to keep prices low.

### 3.2.2 Environmental Costs

The role of transport in generating emissions is well document and undisputed. Reducing transport related emissions is important because it reduces health and environmental costs. The Newcombe Road option will avoid considerable transport distance relative to the alternatives. The additional transport distance generates costs, and if these costs are avoided, then it is treated as a cost saving. Delivering the sand from the alternative sites to the potential sand users will generate considerably more emissions than a Newcombe Road approach these emissions are estimated using published conversion ratios. The additional road transport generates (for every km travelled):

- 5,240g of CO<sub>2</sub> for every km travelled,
- 10.6g of CO,
- 32.83g of NO<sub>x</sub>,
- 1.15g of hydrocarbons and
- 0.64g of PM<sub>10</sub> particulates.

The emissions are translated in Dollar values and two elements are reported. The health effects of the emissions are reported, as is the shadow price of carbon. Emissions are valued using official, whole-of-government, parameters and we considered the shadow price of emissions. This means that CO<sub>2</sub> emissions are valued in a range and projected to rise over time. To take account of this, the average annual shadow price between 2023 and 2048 is used in the analysis. The current estimates for 2023 prices range between \$64/tonne and \$184/tonne. The mid-point value of \$87/tonne is used. Over time, the shadow price increases considerably, with the mid value increasing to \$286/tonne by 2048. This increase highlights the critical importance of reducing emissions.

Based on estimated distance, the associated emissions and the value of emissions, the potential annual environmental savings is estimated

- Health effects from emissions
  - Additional from Titoki + Mercer + Pukekawa \$7.0m
  - Additional from Lemington + Mercer + Pukekawa \$7.6m.
- Shadow price of carbon
  - Additional from Titoki + Mercer + Pukekawa \$3.7m
  - Additional from Lemington + Mercer + Pukekawa \$3.5m.
- **Total**
  - **Additional from Titoki + Mercer + Pukekawa \$10.7m**
  - **Additional from Lemington + Mercer + Pukekawa \$11.1m.**

### 3.2.3 Social Costs

In addition to the direct transport and environmental costs, there are significant social costs associated with injuries and deaths. Each extra kilometre travelled by trucks increases the likelihood of injuries, serious injuries, and fatalities. Using official valuation approaches, these risks are converted into social costs, specifically those related to deaths, serious injuries, and minor injuries.



The Ministry of Transport’s metrics suggest that avoiding additional transport can lead to substantial savings. Given that the Value of a Statistical Life (VoSL) is estimated at \$14.2 million, a serious injury at approximately \$0.7m, and a minor injury at \$78,000, mitigating the risk of injuries has a measurable economic value.

The annual avoided costs associated with the different approaches are:

- Social costs avoided:
  - Additional from Titoki + Mercer + Pukekawa \$7.1m
  - Additional from Lemington + Mercer + Pukekawa \$7.0m.

As with environmental costs, these social costs are likely to rise over time as the Value of a Statistical Life and other social cost metrics increase.

### 3.3 Total benefits (Avoided costs)

The benefits associated with incorporating Newcombe Road sand into the Waikato-Bay of Plenty supply network will accrue over multiple years. These annual values are expressed in present value terms and discounted at 5% (as presented above). Using a default discount rate of 5% over a 35-year period, the present value of the benefits (avoided costs) is estimated as follows:

- Direct transport costs \$166.7m to \$168.7m
- Environmental costs \$10.7m to \$11.1m
  - *Health related costs* \$7.0m to 7.6m
  - *Shadow price of Carbon* \$3.5m to \$3.7m
- Social costs \$7.0m to 7.1m
- **Total** \$179.5m to \$181.2m

**Based on the above transport, environmental and social costs that would be avoided by enabling Newcombe Road sand extraction, is estimated at between \$179.5m to \$181.2m.**

This represents the economic benefit (in the form of avoided costs) that accrue to the region’s economies - and ultimately households. Looking forward, the transport costs will be significantly higher if sand is transported from sources that are located further than the Newcombe Road resource. These estimates will be greater if production grows more than those used here.

There is some uncertainty around the alternatives that could be developed. Similarly, the sand market in Auckland could draw resources from Waikato meaning that the existing supply network will see substantial disruption with even greater pressures on local resource to assist with understanding uncertainty, the costs associated with the Newcombe Road operation are estimated and an alternative (hypothetical) location is used. This is done by changing the total distance associated with servicing Newcombe Road’s anticipated markets and then re-estimating the total costs. Three potential outcomes are shown:

- **+10% in total distance +\$12.5m**
- **+25% in total distance +\$24.9mm**
- **+50% in total distance +\$62.3m**

These percentage shifts will take the weighted average distance to 51km, 58km and 69km, respectively. The effective distance beyond which it generally becomes uneconomical to transport sand is seen as in the 50km to 60km range, highlighting the locational advantage of Newcombe Road.





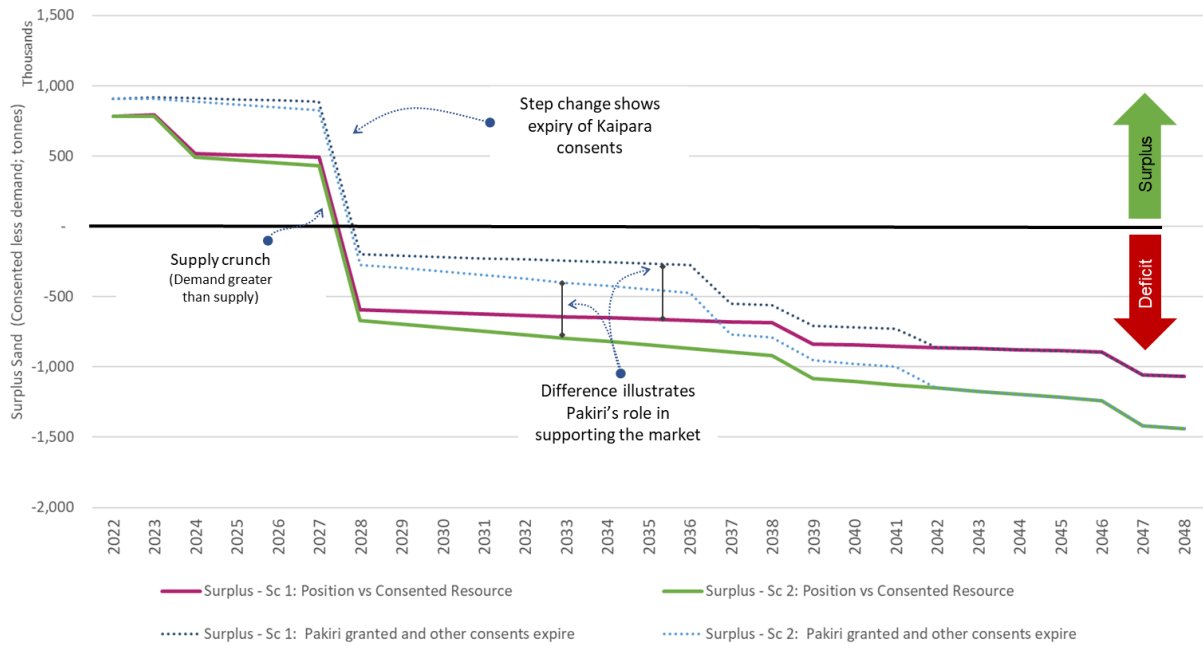
## 4 Concluding remarks

Efficient and sustainable access to sand will be an important factor in both facilitating economic growth aspirations and providing infrastructure such as roads, buildings, and other infrastructure to support the Waikato and Bay of Plenty's rapidly growing population and economy.

The sand market in Auckland is being disrupted and a likely outcome is that sand will be imported from the Waikato. This will place additional pressure on local resource and local demand will compete against Auckland concrete producers and sand users. Establishing Newcombe Road will support the regionally significant and essential sand industry to fulfil local demand while also supporting other regions (e.g., wider Waikato and Bay of Plenty).

The analysis shows that the region is likely to encounter a deficit in the short term as consents expire. Without new resources being developed, or the life of existing ones being extended, the region will not have sufficient capacity to support infrastructure investment and other sand users. The economic costs associated with such a deficit are significant. Servicing the demand using potential alternatives is difficult because there is limited certainty about the future availability of the resources. Without the Newcombe Road resource, there will be significant additional costs.

## Appendix 1: Auckland Sand Sufficiency



Source:

Statement of Evidence: Lawrence McIlrath. Environment Court ENV 2022-AKL-000121. December 2022