LANGWARRIN QUARRY EXPANSION: ECONOMIC CONTEXT

URBIS

Prepared for Heidelberg Materials
June 2025

This report is dated **18 June 2025** and incorporates information and events up to that date only and excludes any information arising, or event occurring, after that date which may affect the validity of Urbis Pty Ltd's (Urbis) opinion in this report. Urbis prepared this report on the instructions, and for the benefit only, of **Heidelberg Materials** (Instructing Party) for the purpose of **Langwarrin Quarry Expansion: Economic Context** (Purpose) and not for any other purpose or use. Urbis expressly disclaims any liability to the Instructing Party who relies or purports to rely on this report for any purpose other than the Purpose and to any party other than the Instructing Party who relies or purports to rely on this report for any purpose whatsoever (including the Purpose).

In preparing this report, Urbis was required to make judgements which may be affected by unforeseen future events including wars, civil unrest, economic disruption, financial market disruption, business cycles, industrial disputes, labour difficulties, political action and changes of government or law, the likelihood and effects of which are not capable of precise assessment.

All surveys, forecasts, projections and recommendations contained in or made in relation to or associated with this report are made in good faith and on the basis of information supplied to Urbis at the date of this report. Achievement of the projections and budgets set out in this report will depend, among other things, on the actions of others over which Urbis has no control.

Urbis has made all reasonable inquiries that it believes is necessary in preparing this report but it cannot be certain that all information material to the preparation of this report has been provided to it as there may be information that is not publicly available at the time of its inquiry.

In preparing this report, Urbis may rely on or refer to documents in a language other than English which Urbis will procure the translation of into English. Urbis is not responsible for the accuracy or completeness of such translations and to the extent that the inaccurate or incomplete translation of any document results in any statement or opinion made in this report being inaccurate or incomplete, Urbis expressly disclaims any liability for that inaccuracy or incompleteness.

This report has been prepared with due care and diligence by Urbis and the statements and opinions given by Urbis in this report are given in good faith and in the belief on reasonable grounds that such statements and opinions are correct and not misleading bearing in mind the necessary limitations noted in the previous paragraphs. Further, no responsibility is accepted by Urbis or any of its officers or employees for any errors, including errors in data which is either supplied by the Instructing Party, supplied by a third party to Urbis, or which Urbis is required to estimate, or omissions howsoever arising in the preparation of this report, provided that this will not absolve Urbis from liability arising from an opinion expressed recklessly or in bad faith.

Urbis acknowledges the important contribution that Aboriginal and Torres Strait Islander people make in creating a strong and vibrant Australian society.

We acknowledge, in each of our offices, the Traditional Owners on whose land we stand.

Urbis staff responsible for this report were:

Director	Rhys Quick
Associate Director	Lily Havers
Consultant	Hugh Molenaar

Project code	P0052037
Report number	Final

CONTENTS

Executive Summary	4
Expansion Overview	5
The Victorian Extractive Resource Industry	7
Demand and Supply of Sand	10
Langwarrin Quarry Expansion Economic Benefits	21
Summary and Conclusions	24
Appendix A: REMPLAN Methodology	27

EXECUTIVE SUMMARY

EXPANSION OVERVIEW

The expansion of the Langwarrin quarry operations of Heidelberg Materials is driven by the impending depletion of sand and gravel supply at a time when demand for construction projects such as roads, highways and residential dwellings to support ongoing and future development in Melbourne's outer south-east corridor is increasing.

THE EXTRACTIVE RESOURCE INDUSTRY

Maintaining adequate resource supply is essential in supporting the Victoria's anticipated growth over time.

Analysis of various studies reveals that forecast demand for extractive resources within Victoria has always been historically underestimated, with actual production figures stronger than demand projections.

Increased statewide demand for extractive resources

Studies indicate a 2.5% annual increase in demand to 2030[1], driven by major construction projects and local population growth within Victoria.

Increased statewide demand for sand and gravel

Demand projected to increase by 41% from 2021 to 2030, or 195.1 million tonnes. An additional 6.3 million tonnes will be required by 2030, the equivalent of 13 new quarries or substantial production increase from existing quarries[1].

FUTURE SUPPLY

Future supply will depend on the approval of new work authorities and variations to existing work authorities.

Victoria faces a significant risk of supply shortages if major quarries were to exit the market without being replaced, due to the depletion of current reserves and land-use challenges in key sand-producing areas.

Increasing annual sand and gravel production

Annual production has grown since modelling was conducted, growing by 3% from FY22-23 to FY23-24 and 18% over the past five-financial years[2].

Replenishment rate declining, supplies dwindling

Replenishment declining due to competing land uses, changing community values. Sand and gravel quarry supply is heavily dependent on the number of new work authorities or work plan variations, with modest approved reserves

FUTURE DEMAND DRIVERS

SHORT-TERM

Roads, highways and subdivision construction

Pipeline of residential construction

Gross State Product growth

MEDIUM-TERM

Population growth

COSTS OF INCREASED TRANSPORT DISTANCE

Without new supply, the cost of extractive materials is expected to increase due to transport related costs.

Longer trucking distances

The cost of transporting sand and gravel to Melbourne is expected to increase from 62 km to 183 km, representing a three-fold increase[1].

Product accessibility and affordability

Reduction in key supply areas and higher resultant transport costs from longer trips are likely to increase the price of sand and gravel.

ESTIMATED ECONOMIC BENEFITS OF PROPOSED LANGWARRIN EXPANSION[3]:

+4 additional direct jobs

$8.7+ million annual economic output (direct and indirect)

+7 additional indirect jobs

$260 million aggregated output over 30 years (or total GVA $120 million)

$4 million value added annually

Fuel and labour cost savings from reduced travel distances

OTHER BENEFITS:

Pricing and competition maintaining healthy level of competition reduces price

Supporting local development shorter distances reduces cost

[1] *Extractive Resources Supply and Demand Study 2022-2030* [2] *Extractive Resources Regulator Annual Statistics Reports* [3] *REMPLAN*

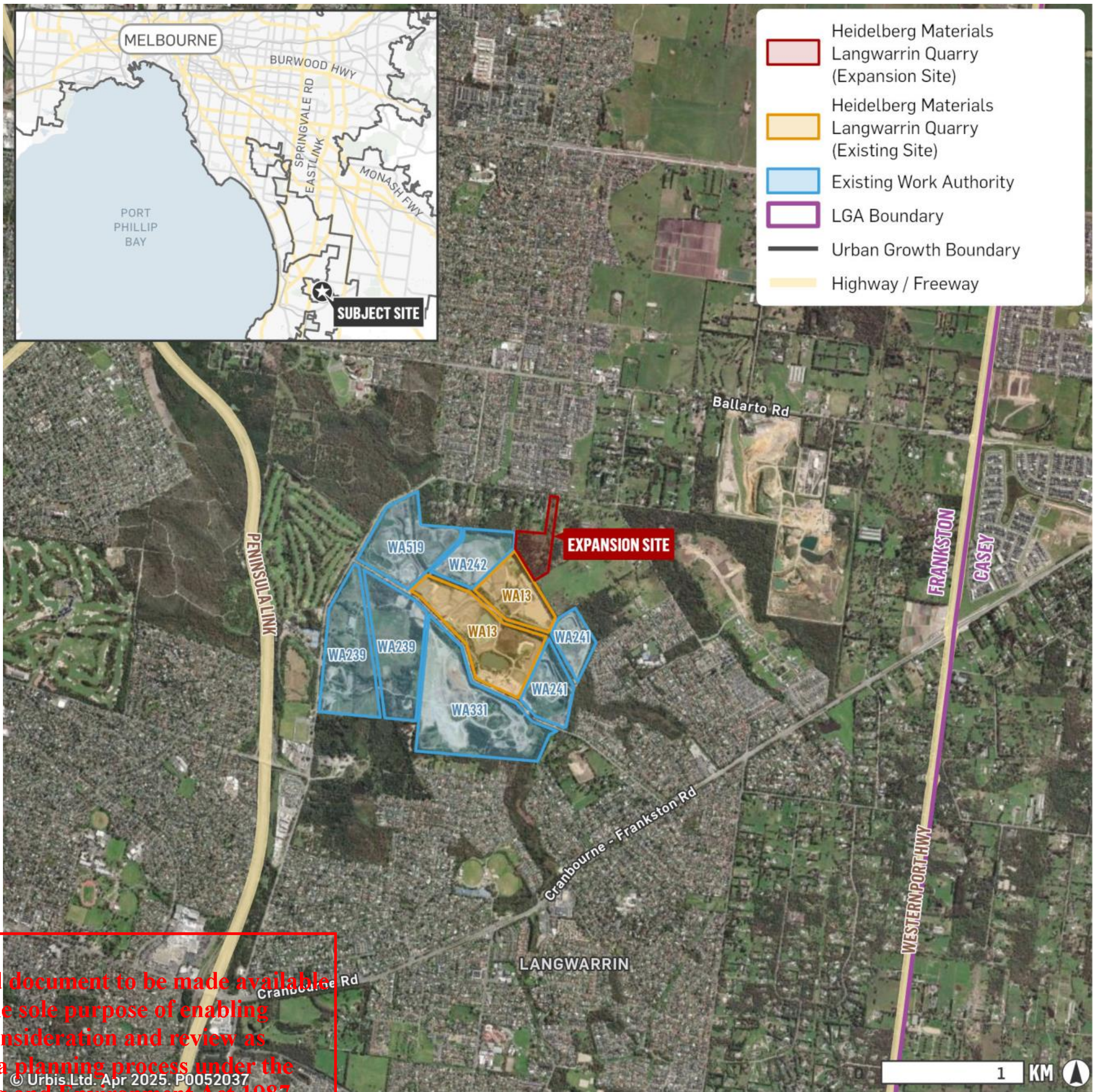
01
EXPANSION OVERVIEW

SITE CONTEXT

Langwarrin Quarry, which operates within Work Authority WA13, is an established sand quarry situated approximately 40 km southeast of Melbourne's CBD at 150-190 Quarry Road, Langwarrin. The quarry has been in operation since 1975, with Heidelberg Materials (formerly Hanson Construction Materials) operating it since 2016.

The Langwarrin Quarry's sand reserves are noted as being near exhaustion. Consequently, Heidelberg Materials is proposing to extend its operations to a site of adjoining the existing operations at 60 Valley Road, Langwarrin.

Heidelberg Materials Langwarrin Quarry is situated among a group of extractive industry facilities. Critical transport linkages are essential for efficient quarry operation, and the site is strategically positioned with access to the Mornington Peninsula Freeway and Western Port Highway, providing convenient access to areas to the north and south.



02
THE VICTORIAN EXTRACTIVE RESOURCE INDUSTRY

EXTRACTIVE MATERIALS IN VICTORIA

Extractive materials like sand, gravel, hard rock, and clay are crucial components for various products, including concrete, asphalt, road base, fill, bricks, tiles and glass, all of which are vital to the construction industry.

Extractive stone resources in Victoria are grouped into four main categories. These are hard rock, sand and gravel, clay and clay shale and limestone:

- **Hard rock** includes basalt, hornfels, granite, rhyolite, and rhyodacite, among other types of rock. There are various grades of hard rock, each with different specifications suited to different infrastructure projects.
- **Sand and gravel** of a high specification is most sought after by concrete and asphalt producers. Bricks and plastering also require sand, but this can be of different specifications.
- **Clay (and clay shale)** are used in the manufacture of bricks, pavers and roofies tiles.
- **Limestone** is used in cement making and in agriculture to improve soil fertility and reduce acidity.

In 2022-23, Victoria produced approximately 72.3 million tonnes of extractive resources, including 15.8 million tonnes of sand and gravel – which made it the second-most extracted resource category within Victoria.

Accounting for 22% of total extractive resource production, sand and gravel sales exceeded $290 million during this period.

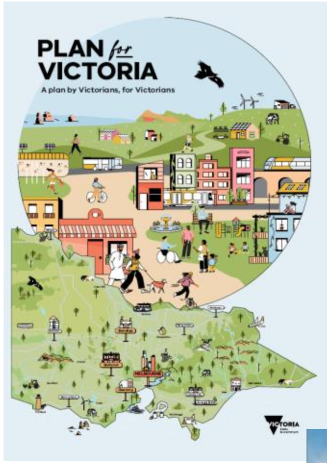
VICTORIAN PRODUCTION AND VALUE OF SALES BY ROCK TYPE, FY 2022-23

Rock type	Production (Million tonnes)	% of total Production	Value of sales ($ million)
Hard rock	48.5	67%	$955.1
Sand and gravel	15.8	22%	$290.3
Clay (and clay shale)	1.6	2%	$4.9
Limestone	2.0	3%	$38.9
*Other	4.4	6%	$68.0
Total	**72.3**	**100%**	**$1,357.1**

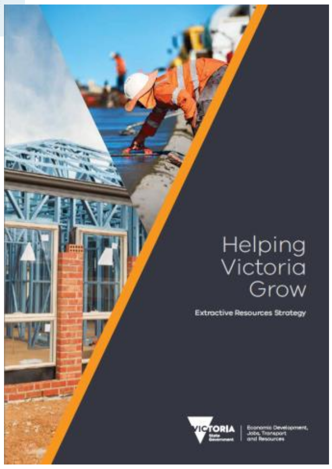
**Other – includes Scoria, Sedimentary, Soil and Tuff materials*
Table may not add due to rounding.
Source: Earth Resources Regulator Annual Statistical Report 2022-23; Urbis.

STRATEGIC IMPORTANCE OF EXTRACTIVE RESOURCES

Extractive resources play a crucial role in Victoria, with several strategic documents emphasising the need to maintain sufficient supplies to support Victoria's anticipated strong growth over the coming decades

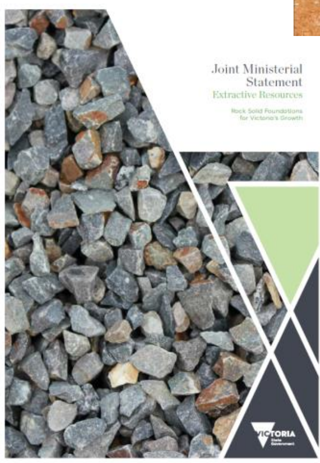


Plan for Victoria (2025): Recognises the need to safeguard essential quarry resources. The policy highlights: *Victoria's growth will produce greater demand for quarry materials, which are necessary for our construction needs. These must be sourced close to where they are needed to minimise transport costs and emissions and make what's built more affordable and sustainable"* (pg. 11).



Helping Victoria Grow – Extractive Resources Strategy (2018): Identifies the forecast level of demand of extractive resources had increased by 2018, relative to earlier work commissioned in 2016 (which estimated demand for extractive resources would double by 2050). The report finds: *"Victoria's high demand for extractive resources and emerging supply shortfalls are creating an urgent need for the Government to take immediate action to secure the high-quality resources needed to meet Victoria's current and future infrastructure and affordable housing requirements" (pg.5).*

Joint Ministerial Statement on Extractive Resources (2018): Highlights the need for good quality and competitively priced extracted sand and gravel as a solid foundation for the State's growth. The purpose of the statement was to deliver better land use planning and regulation approaches to secure the quarries to meet a growing need.



With impending population growth anticipated within Victoria, the statement also supports the need to identify and protect extractive resources of strategic importance, while reducing environmental impact of quarrying to deliver landscapes for the community.

Strategic Extractive Resource Areas (SERA) pilot project: The Minister for Planning approved and adopted Planning Scheme Amendment VC196, which provides new zone and overlay controls that provide stronger recognition and protection to existing industries, whilst designating land with state-significant earth resources where extractive industries may be established in the future, as "Strategic Extractive Resource Areas". The draft planning controls aim to ensure only suitable development and land use occurs near quarry sites and on land with strategic resources.

03
DEMAND AND SUPPLY OF SAND AND GRAVEL

VICTORIAN EXTRACTIVE RESOURCES SUPPLY AND DEMAND STUDY

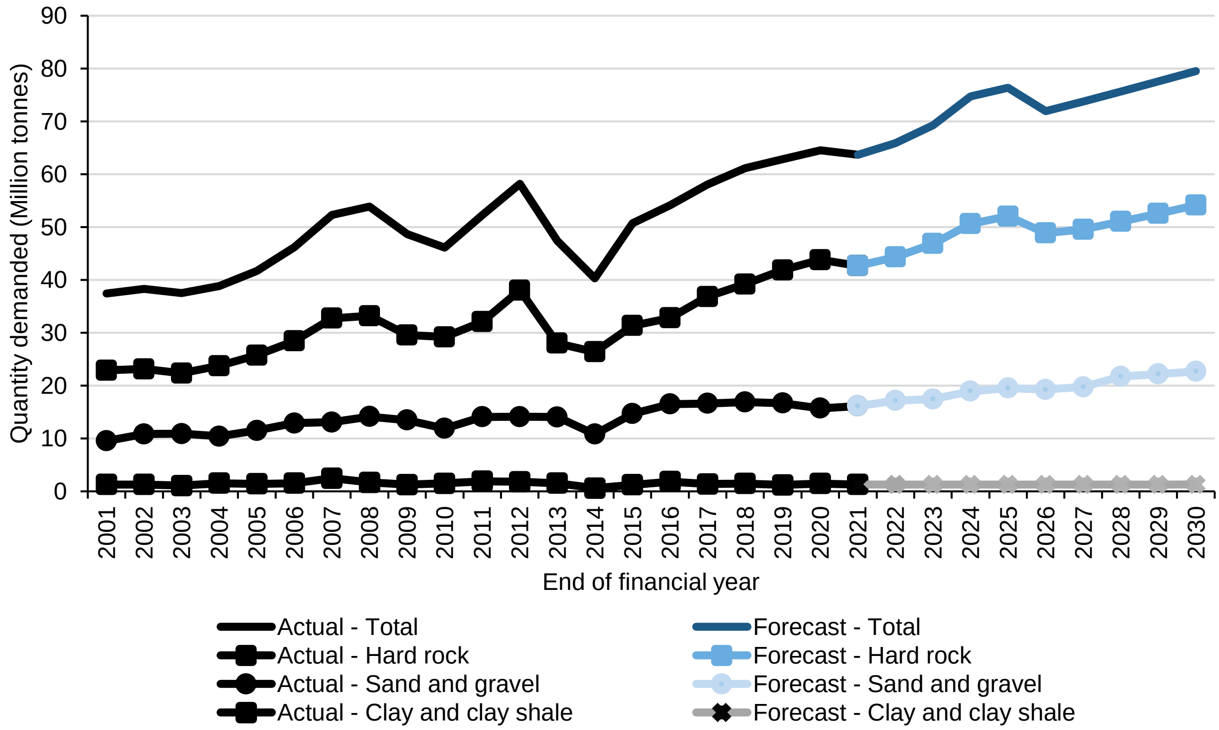
Supply and demand for extractive resources in Victoria have been subject to several studies, the most recent being the *Extractive Resources Supply and Demand Study 2022-2030* (**the 2023 Study**) as prepared by the State of Victoria Department of Energy, Environment and Climate Action (DEECA) in 2023.

*Note, this report superseded the Extractive Resources in Victoria: Demand and Supply Study 2015-50 (**the 2016 Study**) prepared for the Department by PwC in 2016.*

The 2023 Study assesses whether Victoria has the supply of extractive resources to meet demand between 2021-22 and 2029-30. Key findings include:

- Statewide demand for extractive materials is expected to increase by 2.5% per annum from 63.7 million tonnes in 2020-21 to 79.5 million tonnes by 2030.
- Projected demand is higher than historical growth (2.06% per annum from 2001-2021), fueled by Victoria's Big Build and Big Housing Build projects, along with high levels of residential and infrastructure construction driven by population growth.
- Demand for sand and gravel is expected to grow by an average of 0.4% per year to 2030, with production expected to increase by 41% from 16.1 million tonnes in 2020-21 to 22.7 million tonnes in 2029-30. This amounts to a total cumulative demand of 195.1 million tonnes from 2021-22 to 2029-30.
- An additional 6.3 million tonnes of sand and gravel, a total increase of 38%, will be demanded in 2030 above that supplied to the market in 2021. This equates to an estimated additional 13 quarries in 2030 that each produce 500,000 tonnes per annum. Alternatively in the absence of any new quarries, existing quarries would need to increase production substantially.

VICTORIA HISTORICAL AND FORECAST EXTRACTIVE RESOURCE DEMAND, 2001-2030



Source: Extractive Resources Supply and Demand Study 2022-2030, DEECA, August 2023.

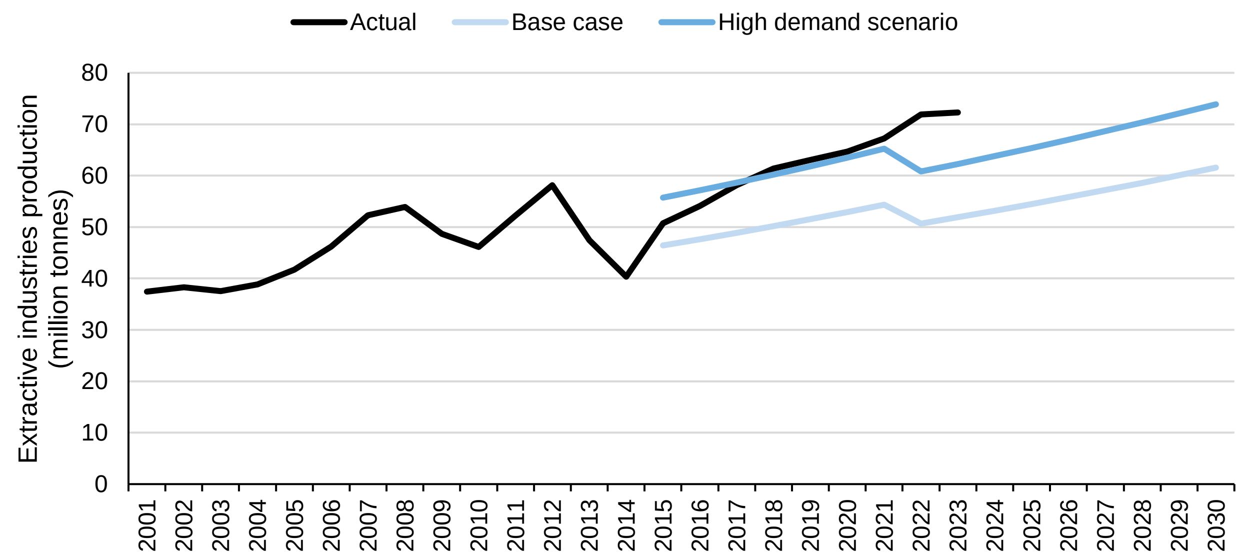
INCREASING DEMAND FOR EXTRACTIVE RESOURCES

The growth projections in the 2023 study reflect the fact that previous iterations **significantly underestimated demand for extractive resources**, reflected by recent production figures. These figures illustrate further increases in the demand for extractive resource production, mainly due to the Government's continued investment in major infrastructure projects.

Over the analysis period of 2015 to 2050, the 2016 study stated demand for total extractive resources across Victoria at 46.4 million tonnes in 2015, then growing to 87.8 million tonnes by 2050 as shown in the chart below.

Up to 2023, the 2016 Study projected demand of 51.9 million tonnes under the base case. Comparing this forecast to the actual production of 72.3 million tonnes, as reported in the latest Earth Resources Regulator Annual Statistical Report, revealed that actual demand for extractive resources has closely followed the "high scenario" forecast presented from that report, **where demand is 20% stronger than expected under the base case.**

FINANCIAL YEAR FORECASTS FOR ALL EXTRACTIVE RESOURCES, 2016 STUDY



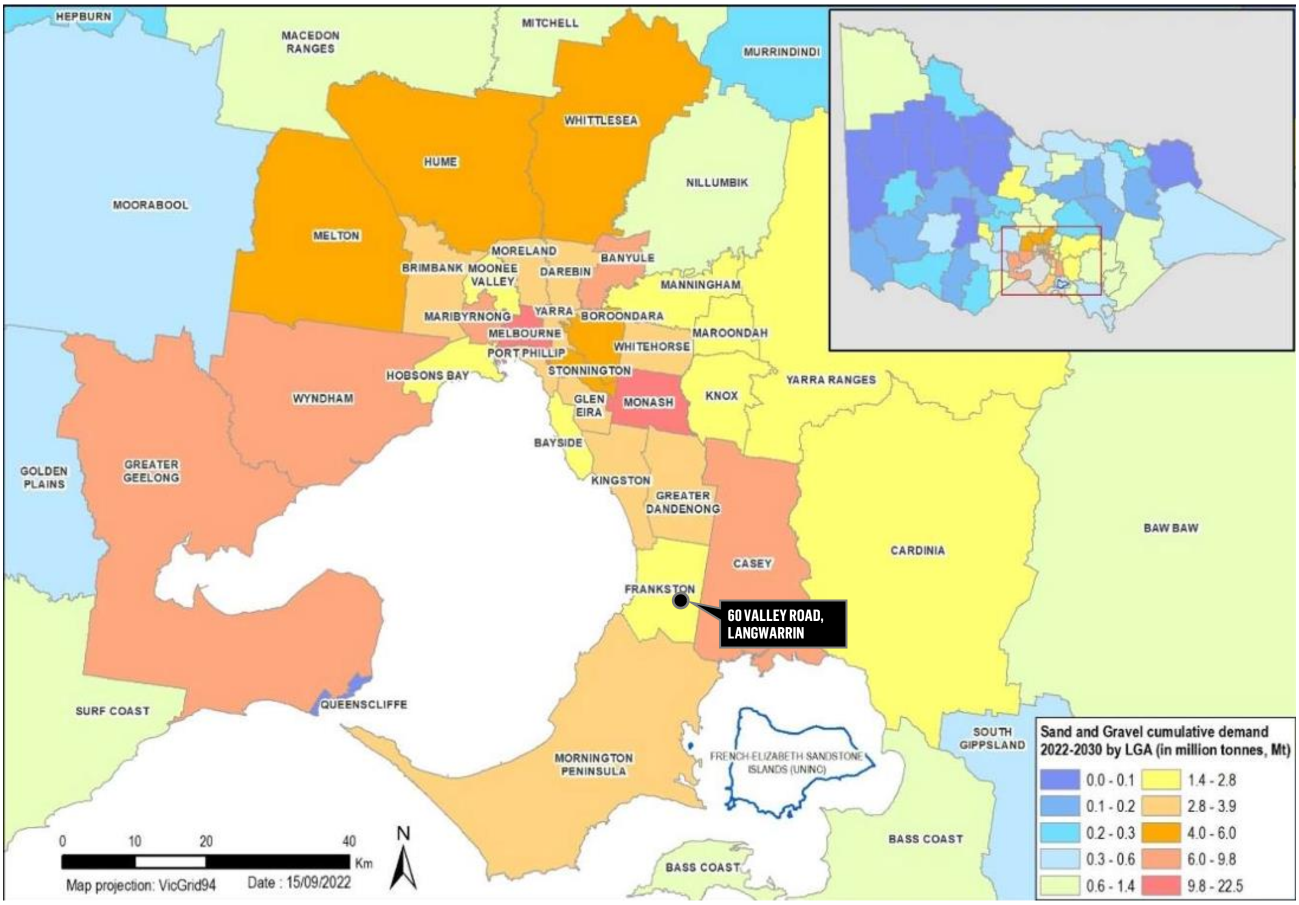
Source: Extractive Resources Supply and Demand Study 2022-2030, DEECA, August 2023.

GEOGRAPHICAL DISTRIBUTION OF DEMAND

Regarding the geographical distribution of demand, the 2023 Study notes:

- Demand forecasts indicate Greater Melbourne will account for around 80% of Victoria's total extractive resource demand from 2021-22 to 2029-30.
- In terms of sand and gravel, the map below highlights strong demand throughout the wider metropolitan Melbourne areas for the next eight years. High demand is noticeable in the Western region (City of Wyndham, City of Greater Geelong) plus the Southern region (City of Casey and City of Monash), with the City of Greater Dandenong and the Mornington Peninsula also presenting moderate demand. The City of Frankston is also anticipated to record a cumulative demand of 1.4 to 2.8 million tonnes of sand and gravel to 2030.
- Outer urban growth areas such as Greater Geelong, Wyndham, Hume, Whittlesea and Casey LGA's are expected to be major consumers of sand and gravel due to increased construction driven by local population growth and associated higher levels of residential construction.

SAND AND GRAVEL DEMAND FORECASTS, 2022-30



Source: Extractive Resources Supply and Demand Study 2022-2030, DEECA, August 2023.

INCREASING DEMAND FOR SAND AND GRAVEL

The demand forecasts in the 2023 Study rely on the use of historical production data for each of the two rock types (hard rock, and sand and gravel) both separately and in total to develop short- and medium-term models. The models assume that the level of production in 2020-21 represents demand and then it applies various demand drivers and makes assumptions about how much of an impact this will have on future demand.

The short-term models are linear econometric models, driven by macroeconomic indicators. The medium-term models are trend models, where total extractive resources and hard rock production grow at their historical rate, and sand and gravel production growth is determined by its historical relationship to population.

Drivers of demand for sand and gravel in the short-and medium-term models are outlined below.

The 2023 Study is a point-in-time analysis (utilising 2020-21 production data as a starting point) and is based on the best information available to DEECA at the time. DEECA notes that feedback from industry since the Study was undertaken indicates that demand is likely to have risen above the Study's forecast levels of demand.

The recent trends in short- and medium-term demand drivers for sand and gravel are outlined overleaf.

DRIVERS OF SAND AND GRAVEL DEMAND IN SHORT- AND MEDIUM-TERM MODELS

SHORT-TERM DRIVERS (2021-22 to 2026-27)

Roads, highways and subdivision construction

Pipeline of residential construction

Gross state product

MEDIUM-TERM DRIVERS (2026-27 to 2029-30)

Population

Source: Extractive Resources Supply and Demand Study 2022-2030, DEECA, August 2023.

SHORT-TERM DRIVERS

Roads, highways and subdivision construction

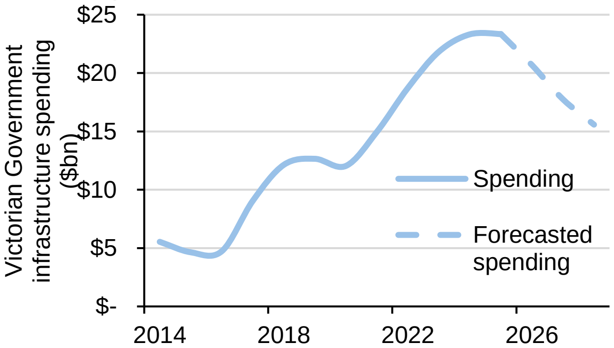
Construction activity in the roads, highways and subdivision category since 2020-21 has increased by 61% to reach $8.4 billion in 2023-24.

While some of this increase can be attributed to inflation, construction activity has been elevated due to Victoria's Big Build and Big Housing Build projects. Victoria's Big Build is a $90 billion investment delivering over 165 major road and rail projects across the state. Major road projects include North East Link and the West Gate Tunnel project.

While government infrastructure spending is projected to decrease from its current high level, it is still expected to stay above long-term historical average.

GOVERNMENT INFRASTRUCTURE SPENDING

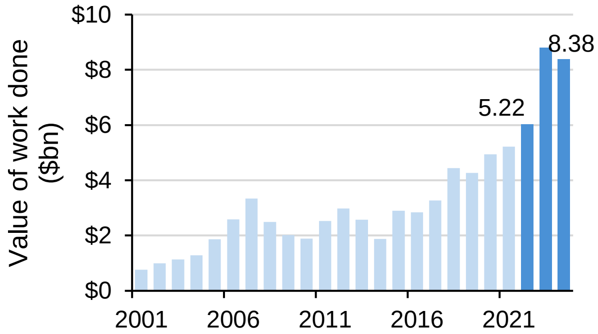
Victoria, FY2014 - 2028



Source: Department of Treasury; Urbis.

VALUE OF ROAD, HIGHWAY AND SUB-DIVISION CONSTRUCTION WORK DONE

Victoria, FY2001 - 2024



Source: ABS Series ID: A1839245X; Urbis

Pipeline of residential construction

Victoria's Housing Big Build is a Government initiative to build 12,000 new homes statewide to 2026, costing $5.3b.

Extensive residential construction has continued in nearby greenfield areas such as Casey, with *Victoria in Future 2023* Population and Dwelling projections forecasting that Casey will provide around 3,700 new dwellings each year by 2036. More locally, Frankston and the Mornington Peninsula are collectively expected provide around 1,000 new annual dwellings collectively over the same period. These forecasts roughly align with the recent Victorian Housing Targets announced in 2025.

New dwelling approvals in Casey have consistently exceeded 3,000 p.a. since 2014, placing pressure on existing sand and gravel supplies

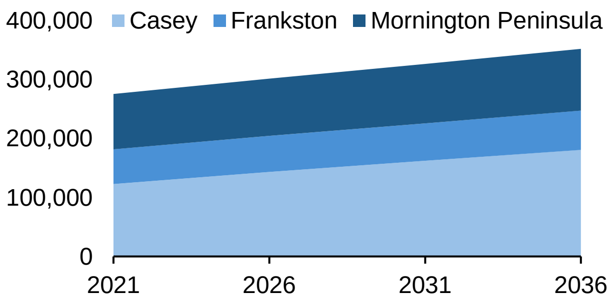
Gross state product

The chart alongside presents the historical annual growth of Gross State Product (GSP), comparing past government projections available at the time of the 2023 Study with the latest projections released after the Study was completed.

Real GSP growth exceeded forecasts in 2021-22 but fell below expectations in 2022-23. The 2024–25 Victorian Budget has forecast real GSP growth slightly lower than the 2022-23 Budget for 2023-24 and 2024-25. From 2025–26 onwards, real GSP growth is project to revert to the long-term average.

VICTORIA IN FUTURE: DWELLING PROJECTIONS

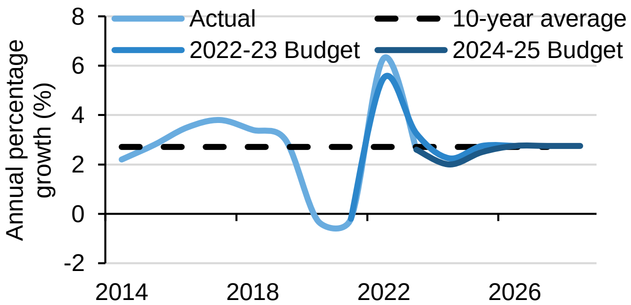
Local Government Areas, 2021-2036



Source: VIF 2023; Urbis

REAL GROSS STATE PRODUCT

Victoria, FY2014 - 2028

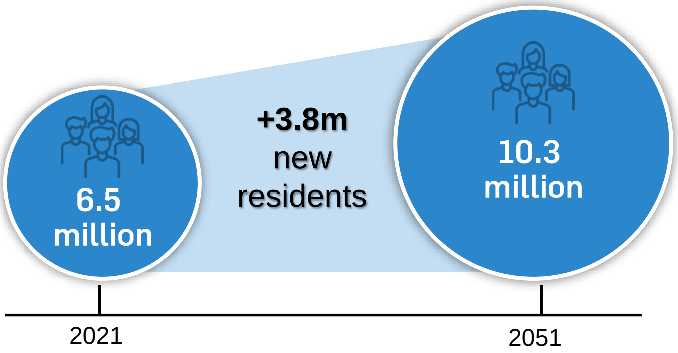


Source: ABS; Victorian Budget Papers; Urbis

MEDIUM-TERM DRIVERS

Population

According to the Victorian Government's Victoria in Future (VIF) projections, the state's population is expected to reach 10.3 million by 2051. This represents annual growth of 1.5% from 2021 to 2051, compared to 1.6% from 2001 to 2021. It is important to note that these are population projections, and that the VIF projection series has consistently underestimated population growth (excluding the COVID-19 period).



Source: VIF 2023; Urbis

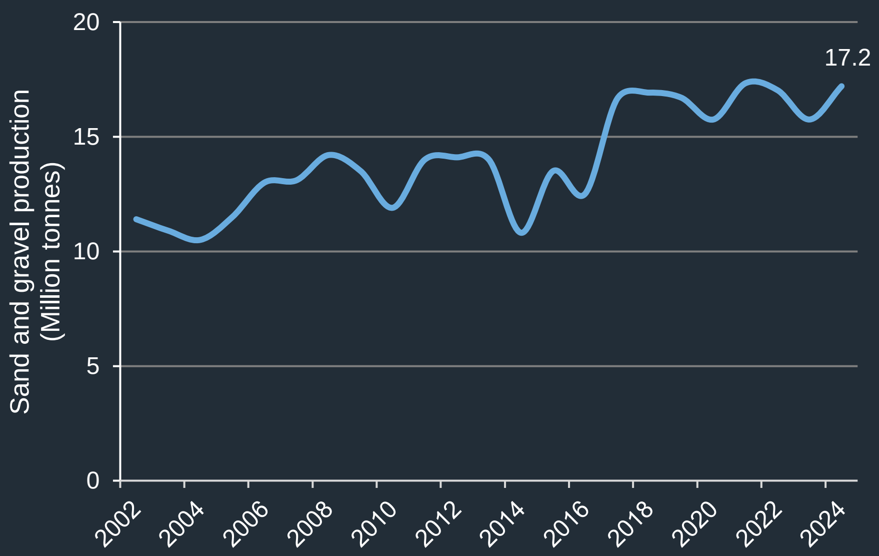
RECENT PRODUCTION CHANGES

Given the shift in the demand indicators outlined, especially the value of construction work, sand and gravel production has significantly increased since the modelling for the 2023 Study was conducted.

Annual growth in total sand and gravel production for Victoria grew by 3% over the last financial year (FY22-23 to FY23-24), and by 18% over the past five-financial years.

SAND AND GRAVEL PRODUCTION VOLUMES

Victoria 2001 - 2024



Source: Extractive Resources Regulator Annual Statistics Reports; Urbis

FUTURE STATE RESOURCE SUPPLY

In assessing supply, the difference between "resources" and "reserves" is defined below:

- "**Resources**": extractive materials that without work authorties lack approval to be extracted (and may never be due to economic and environmental factors)
- "**Reserves**": extractive materials within a Work Authority that has received approval for production and likely to be developed.

While there is no definitive source to quantify the supply of resources in Victoria, the 2023 Study does estimate Victoria's extractive reserves by interviewing 20 companies that control 145 work authorties (comprising approximately 70% of Victoria's 2020-21 production), plus supplementing the balance with resource estimates derived from industry annual reports.

The 2023 study considers three risk/supply scenarios, based on industry survey information about Work Plan Variations and new work authorities. This was correlated with high-level assessments of planning complexity levels (e.g. land use zones, overlays) at supply locations:

- **Low-risk scenario** (low supply replenishment scenario) is the most conservative, assuming only applications for new work authorties and variations to existing work authorities that have limited restrictions (and therefore very likely to be approved).
- **Medium-risk scenario** (medium supply replenishment scenario), assumes both low- and medium-risk applications for approvals will be granted.
- **High-risk scenario** (high supply replenishment scenario), assumes all Work Plan Variations plus new Work Authority permits are approved. This is however unlikely due to delays and restrictions associated with regulatory approvals (including planning permits), community resistance and other factors.

DEECA estimates there are 874 million additional tonnes of extractive materials available to 2030 through new work authorties and Work Plan Variations:

- Victorian work authorties have at least 149 million tonnes of sand and gravel, along with 131 million tonnes that could become available pending regulatory approvals for development
- Sand and gravel represents 28% of additional tonnage in new or varied Work Plan Authorities, with most of the potential supply to be become available through Work Authority variation permits (173 million tonnes compared to 86 tonnes in new work authorties).
- **Due to dwindling sand and gravel supplies, this rock group requires the greatest number of new work authorties or Work Plan Variations.**
- Obtaining approval for a Work Plan Variation requires significant planning and meeting of regulatory requirements. There is therefore a high risk that only a share of possible Work Plan Variations and new Work Authority proposals will proceed. The state cannot rely on the full extent of the extractive material potential from these variations and proposals.
- The extent to which this supply becomes available is unclear. The low-risk scenario (low supply replenishment scenario) provides only 163 million tonnes of additional materials through Work Plan Variations, compared to the total of 847 million tonnes under the high-risk scenario through Work Plan Variations and new work authorties.

ESTIMATES OF EXTRACTIVE RESERVES & RESOURCES

By rock group (at 2022)

Rock Type *Data source*	Reserve (Million tonnes) *Survey data*	Resource (Million tonnes) *Annual report data*
Hard rock	955	434
Sand and gravel	149	131
Clay (and clay shale)	19	9
Other	8	237
Total	**1,131**	**811**

PROPOSED SUPPLY

New work authorties/work plan variations

Rock Type	Work Plan Variations (Mt)	New work authorities (Mt)	Share (%)
Hard rock	563	41	71%
Sand and gravel	173	86	28%
Clay (and clay shale)	11	0	1%
Other	0	0	0%
Total	**747**	**127**	

VARIATIONS/NEW WORK AUTHORTIES

By risk category

Risk Category	Work plan variations (Mt)	New work authorities (Mt)
High	747	127
Medium	253	15
Low	163	0

Source: Extractive Resources Supply and Demand Study 2022-2030, DEECA, August 2023.

FUTURE STATE RESOURCE SUPPLY

Given the shift in the demand indicators outlined previously - specifically construction work - sand and gravel demand has significantly increased since the modelling for the 2023 Study was conducted.

Further, the replenishment rate of extractive resources is steadily declining. Factors such as competing land uses and changing community attitudes are contributing to delays for approvals of new quarries or quarry variations, which is impacting existing reserves.

With fewer new quarries, more extractive resources are being transported further which increases transport costs and carbon emissions.

The two maps overleaf compare the average transport distances, both under the medium replenishment scenario, and are useful for visualising the differential impacts on transport distances for different regions.

For example, LGAs within Greater Melbourne compete for hard rock, sand and gravel. Areas north of Melbourne are at a disadvantage in obtaining sand and gravel as most of the state's supply is close to Port Phillip Bay. Areas such as Mildura and Swan Hill in the state's north are likely to access extractive materials from interstate.

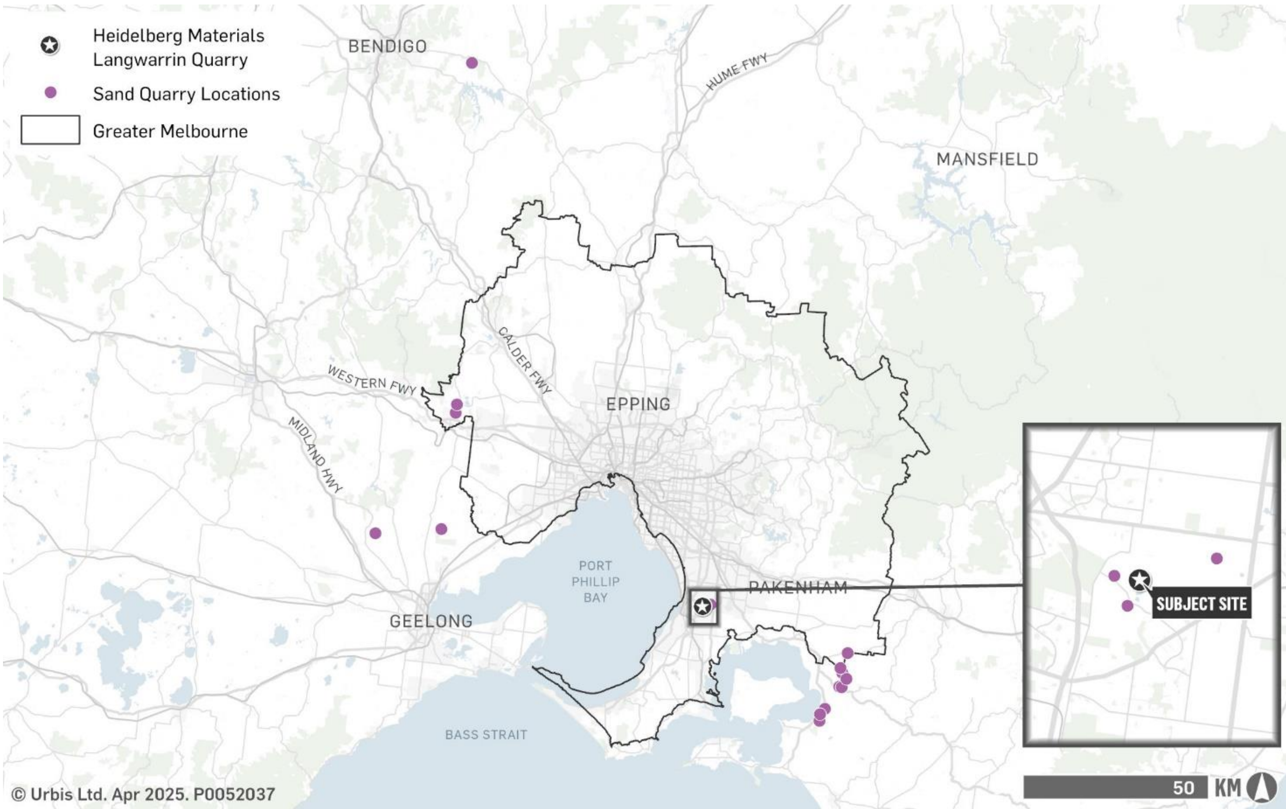
While the results are indicative, when assumptions are made that many work authorities with significant resources or large production capacities are leaving the market as their reserves become depleted, increased transport distances for LGAs are observed, particularly those in Greater Melbourne.

Also, as specifications for high-quality sand and quarry materials become stricter for higher durability projects, supply is further limited. Sustaining the supply of higher-quality materials within Melbourne has therefore become increasingly difficult in the absence of opening or extending more quarries.

The regional supply analysis within the 2023 Study outlined that supply is more localised in certain areas of the State, with most of the sand supply in the Lang Lang to Grantville sand belt, which spans the local government areas (LGAs) of Cardinia, Bass Coast and South Gippsland to the east of Greater Melbourne.

Victoria therefore has a higher risk of sand supply shortfalls if a major quarry in a sand-producing region were to withdraw from the market without replenishment. This is pertinent as current sand reserves are increasingly depleting and key sand-producing areas face major competing land-use challenges.

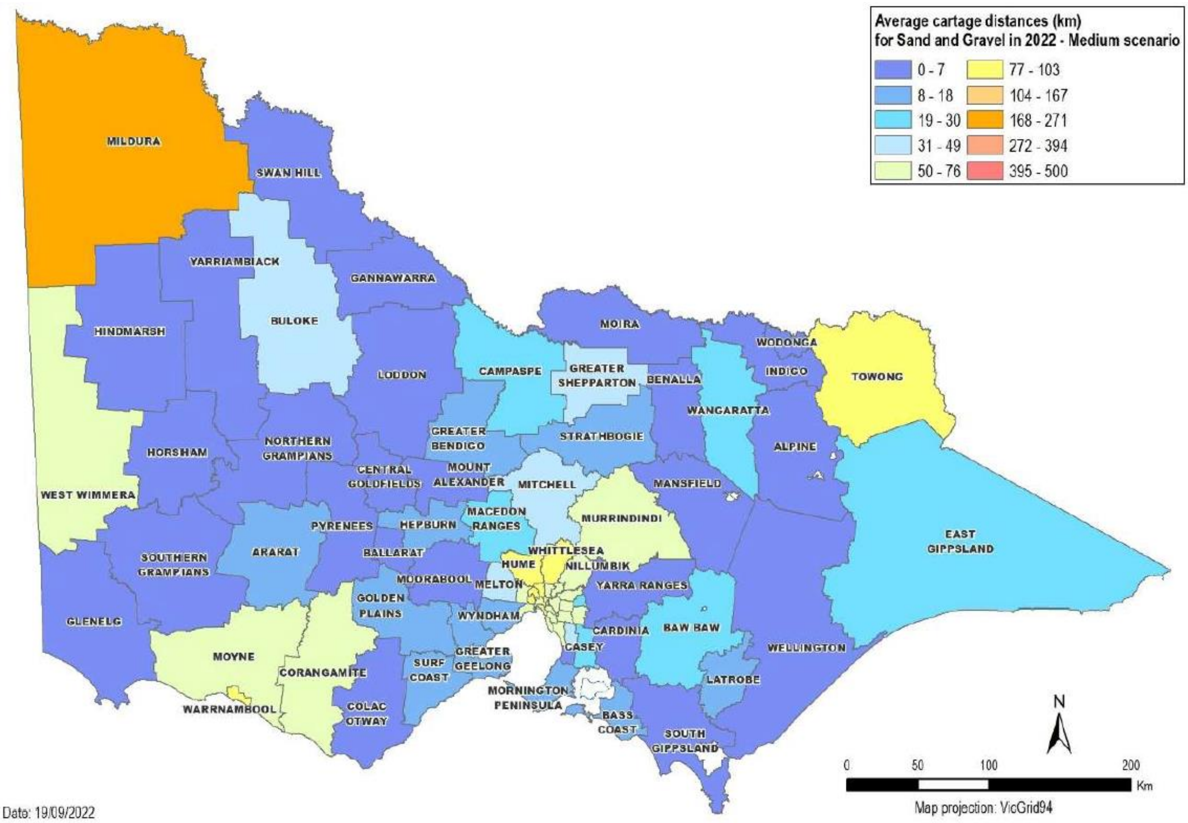
SAND QUARRIES IN VICTORIA*



Note: This is a partial list, but it highlights the concentration of sand quarries near Port Phillip Bay.

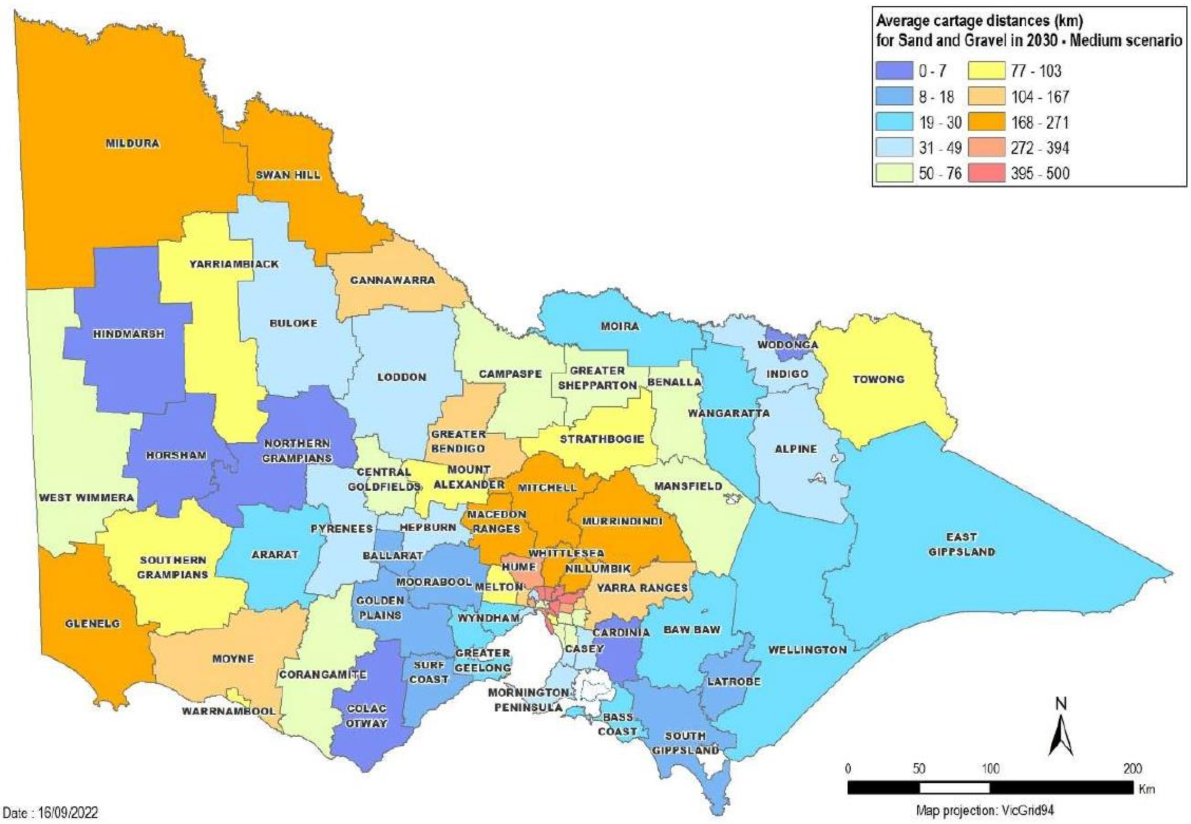
FUTURE STATE RESOURCE SUPPLY

AVERAGE CARTAGE DISTANCES (KM) FOR SAND AND GRAVEL – 2022 (MEDIUM SCENARIO)



Date: 19/09/2022

AVERAGE CARTAGE DISTANCES (KM) FOR SAND AND GRAVEL – 2030 (MEDIUM SCENARIO)



Date : 16/09/2022

DISTANCE AND COST OF TRANSPORT

Victoria has historically benefited from accessible and affordable resource materials, as sources of materials are generally located close to where the market requires them. High transport costs make quarries located near demand centres more viable.

With heavy construction materials for residential and non-residential builds equating to about 40% of building material costs, these cost increases are likely to affect housing, roads, social infrastructure and The Big Build and Big Housing Build projects.

For example, a reduction in annual production of about 1 million tonnes of sand from the eastern regions of Victoria which would increase demand and then would lead to an increase in transport costs of about 40 per cent relative to baseline.

More trucks driving longer distances also increases the state's carbon footprint and the wear and tear on roads.

The simulation modelling tool within the 2023 study, provides insights into the potential impacts on transport distance and costs if sand supply from a particular region were reduced as a result of regional resource exhaustion, without any new replacement quarries.

Modelling future scenarios is critical for planning, as it helps identify locations and streamlines approvals processes to maintain a steady future supply.

The modelling shows that a reduction of sand supply in key supply areas would impact the entire state, specifically as most LGAs would need to source their sand from more distant suppliers.

If supply cannot be expanded in areas close to where demand is, then it is likely that this will increase travel costs. This therefore indicates that prioritistation should be given to approve new work authorties or variations to existing work authorties that have a high production capacity with depleting reserves.

With medium scenario replenishment assumptions, it is expected that between 2021 and 2030, the average distance to transport sand and gravel to Melbourne could increase from 62 km to 183 km, almost a three-fold increase. This is of concern because transport costs are approximately 25-30% of total extraction cost for quarries close to project sites, with trucking costs estimated to be about 20 cents per tonne per kilometre.

WEIGHTED AVERAGE TRANSPORT DISTANCES FOR SAND AND GRAVEL

Year	Low replenishment scenario		Medium replenishment scenario		High replenishment scenario	
Average transport distance to…(km)	Greater Melbourne	Regional Victoria	Greater Melbourne	Regional Victoria	Greater Melbourne	Regional Victoria
2022	62	20	62	20	62	20
2030	209	63	183	63	138	63

Source: Extractive Resources Supply and Demand Study 2022-2030, DEECA, August 2023.

03
LANGWARRIN QUARRY EXPANSION ECONOMIC BENEFITS

ECONOMIC CONTRIBUTION OF LANGWARRIN QUARRY

Expanded operations at the Langwarrin Quarry are expected to provide significant economic benefits to the local economy and wider region through the employment of administrators, drivers and equipment operators and maintenance workers.

With four additional direct jobs (i.e. jobs on site) expected to be supported after the expansion of the quarry, as instructed by Heidelberg Materials, REMPLAN economic modelling was used to quantify the annual employment and economic contributions the quarry could potentially generate on an ongoing basis. An explanation of the REMPLAN economic modelling methodology is provided in Appendix A.

The four new jobs are **estimated to support an additional seven indirect full-time equivalent (FTE) jobs**, through flow-on effects that support numerous businesses and workers not otherwise operating in an area. These include the likes of administration staff, servicing and maintenance of machinery, equipment and vehicles, truck tyre fitters, weigh-bridge suppliers or machine manufacturers and repairers.

Annual economic output (both direct and indirect) generated by the quarry expansion is **estimated at just over $8.7 million (2024 dollars) annually** on average, with the value added to the economy **totalling $4 million for each year of operation**.

ANNUAL AVERAGE ECONOMIC BENEFITS FROM ONGOING OPERATION

GROSS VALUE ADDED TO STATE ECONOMY
$4.0 million total GVA p.a.

$2.6 million
Direct GVA p.a.

$1.4 million
Indirect GVA p.a.

ONGOING JOBS
11 total FTE jobs p.a.

4
Direct FTE jobs p.a.

7
Indirect FTE jobs p.a.

ECONOMIC OUTPUT
$8.7 million p.a.

$5.5 million
Direct Output p.a.

7
Indirect Output p.a.

**Note: Excludes benefits from infrastructure development e.g. road, utility, etc.;*
Mining Industry used for economic modelling
FTE = Full-Time Equivalent Jobs; GVA = Gross Value Added, Indirect benefits refer to Supply Chain effects but not Consumption Effects.
A full description of the methodology and key assumptions applied are included in the Appendix.
Source: REMPLAN; Urbis

COST REDUCTION AND OTHER BENEFITS

To minimise costs to consumers, preference should be given to use quarries close to site projects in construction before utilising other quarries further away. There are several ways in which shorter travel distances help reduce costs through:

- **Reduced fuel consumption**
- **Reduced labour hours**
- **Reduced vehicle wear and tear**

Savings on transport costs from supplying quarry products from a local quarry can be significant. Applying an average transport cost (*DEECA 2023*), sourcing quarry products from a site 25km away instead of one 50km away could save $5 per tonne. This would represent more than a quarter of the current average sale price for sand and gravel, likely leading to increased prices to cover that cost within the industry.

Not only are significant transport distances contributing to increased prices for the supply of resources, other economic and social impacts of heavy transport include factors such as carbon emissions, road safety, road maintenance and further infrastructure spending are significant.

The approval of quarries closer to demand centres helps reduce these costs and impacts. The expansion of the Langwarrin quarry in this context will reduce costs associated with serving the high demand generated in Melbourne's south-east.

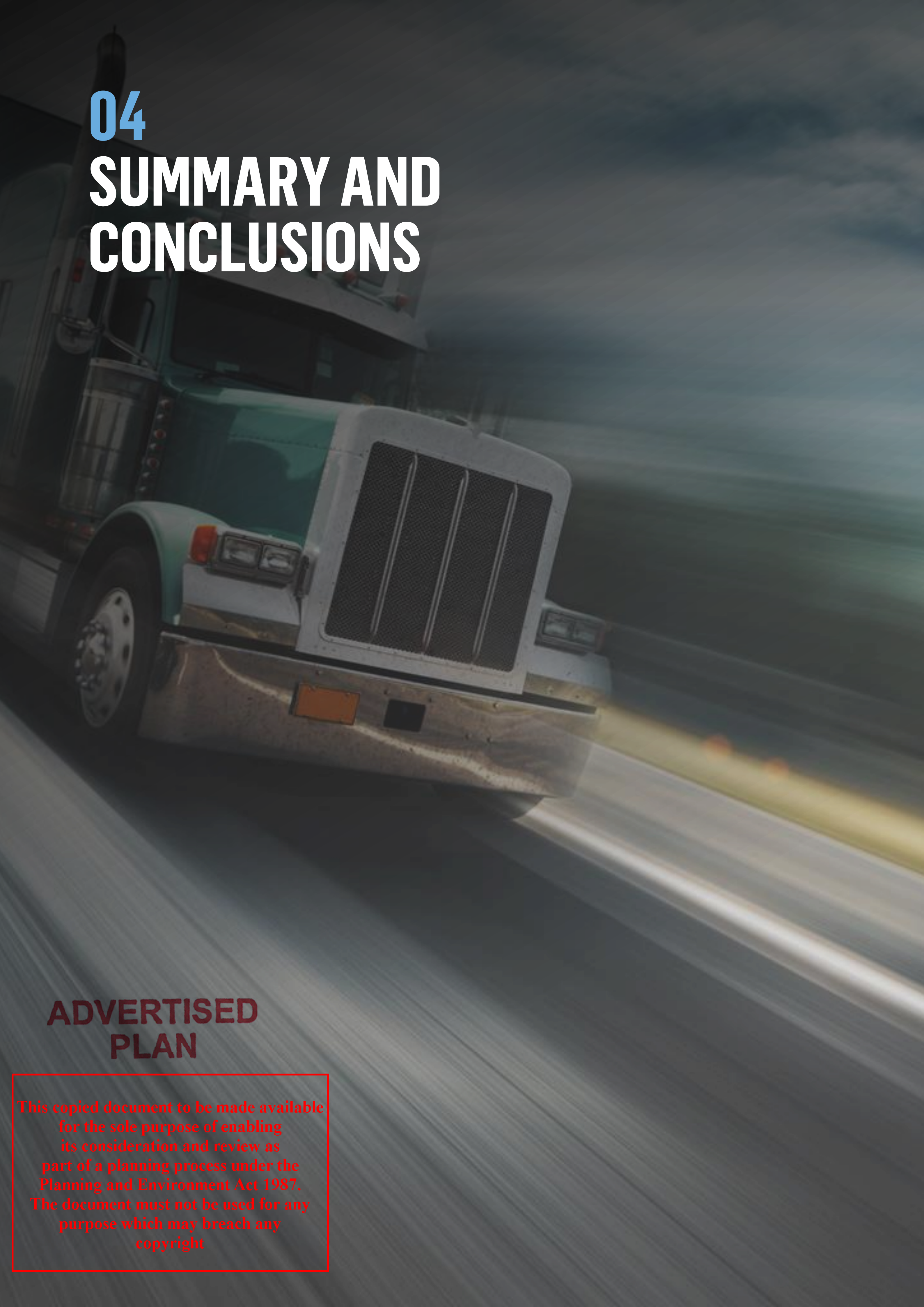
In addition to more quantifiable benefits, there are other benefits that may manifest in other forms from being able to access sand and gravel resources locally. These include but are not limited to:

Competition & choice.
Maintaining a healthy level of competition ensures choice, convenience and quality of services, particularly important for a market where a small number of large quarry operators control the major resource areas in the region.

Price competition.
Consistent supply plus greater competition and choice can curtail price increases, which can occur when supply is not able to keep pace with demand

Supporting local developments.
Regional construction sites benefit from access to local sand and gravel resources, as shorter travel distances from quarry to site reduces overall costs. While large infrastructure projects may be able to absorb costs of greater transport distances, this is not as simple for smaller projects.

04
SUMMARY AND CONCLUSIONS



KEY FINDINGS

Langwarrin Quarry, operating under Work Authority WA13, is a well-established sand quarry located about 40 km southeast of Melbourne's CBD. The sand reserves at Langwarrin Quarry are nearly depleted. As a result, Heidelberg Materials is proposing to extend its operations to an adjacent site at 60 Valley Road, Langwarrin. This expansion is essential to maintain the supply of sand and gravel locally and statewide.

Key factors supporting the expansion of Langwarrin Quarry are outlined as follows:

New quarries or increased output needed to meet increased demand in Victoria

THE VICTORIAN EXTRACTIVE INDUSTRY

- Previous studies significantly underestimated the demand for extractive resources, as evidenced by recent production figures.
- Due to continued regulatory complexities, competing land uses plus community resistance, the state cannot rely on the full extent of extractive resource reserves, particularly for sand and gravel.
- Growth in extractive resource demand has surpassed historical trends, underscoring the impact of recent residential and government infrastructure construction on sand and gravel resources.

Sand and gravel demand necessitates increased quarry output by 2029-30

INCREASING DEMAND FOR SAND AND GRAVEL

- Demand for sand and gravel is set to rise, with production expected to grow by 41% by 2029-30[1], necessitating either the establishment of new quarries or substantial increases in existing quarry outputs.
- Sand and gravel represents 28% of the additional tonnage demanded[1] in Victoria and requires the most new work authorties or Work Plan Variations due to dwindling supplies.
- To support Victoria's ongoing development and population growth, strategic planning and investment will be required to ensure a sustainable supply of extractive resources

Construction continues to drive sand and gravel demand in the short-term

SHORT-TERM DEMAND DRIVERS

- Sand and gravel production in Victoria has significantly increased, with annual growth of 3% last year and 18% over the past five years.
- The surge in sand and gravel production was likely due to the 61% increase in construction activity for roads, highways, and subdivisions since 2020-21, driven by projects like Victoria's Big Build and Big Housing Build.
- New dwelling approvals in Casey have consistently exceeded 3,000 annually since 2014, which has increased the pressure on sand and gravel supplies.

Population growth is expected to continue the increased demand for sand and gravel

MEDIUM-TERM DEMAND DRIVERS

- Sustained population growth will continue to drive Victoria's Housing Big Build, which aims to construct 12,000 new homes statewide by 2026. Significant residential construction in areas like Casey and Frankston will increase pressure on local sand and gravel supplies.
- State population projections estimate that Victoria will reach 10.3 million residents by 2051, representing annual growth of 1.5% from 2021 to 2051 in comparison to 1.6% from 2001 to 2021.

[1] *Extractive Resources Supply and Demand Study 2022-2030*

KEY FINDINGS

The expansion of the Langwarrin quarry is expected to reap many benefits across the local and state economy, both indirectly and directly.

Benefits of expansion at Langwarrin quarry include and are not limited to:

Quarry expansion is projected to generate $8.7 million in economic output and 11 jobs annually.

Local quarries reduce customer and transport costs, emissions, and support regional projects

ECONOMIC CONTRIBUTION OF EXPANSION

- Expansion of the quarry is expected to create four direct on-site jobs, and in turn provide an additional seven FTE jobs which benefits a range of local businesses and services providers.
- Annual economic output generated by the quarry expansion is estimated to be over $8.7 million annually on average, with the value added to the economy totaling $4 million for each year of operation[2].
- Flow-on effects of the quarry's expansion will support various sectors such as administration, machinery maintenance and equipment servicing, thereby boosting the region's overall economic

COST REDUCTION AND OTHER BENEFITS

- Other benefits include significant savings on transport costs by sourcing quarry products locally. Potential savings of around $5 per tonne represent more than a quarter of the current average sale price for sand and gravel.
- Approving quarries closer to demand centres helps meet high demand efficiently, particularly in Melbourne's south-east, and supports regional construction projects by reducing overall costs.
- Reducing transport distances not only lowers costs but also mitigates economic and social impacts such as carbon emissions, road safety concerns, and infrastructure maintenance.
- Sourcing local extractive resources fosters healthy competition and choice, curtailing price increases and ensuring quality services that are crucial in a market dominated by a few large operators.

[2] REMPLAN

APPENDIX A: REMPLAN METHODOLOGY

REMPLAN METHODOLOGY

Methodology

Analysis presented in the report uses REMPLAN to access current and potential economic impacts.

REMPLAN provides a modelling tool that is accepted and used by various government bodies in Australia, using an input-output model that captures inter-industry relationships within an economy based on the ABS 2016/17 National Input Output Tables (I/O Tables). It can assess area-specific direct and flow-on implications across industry sectors in terms of employment, wages and salaries, output and value-added, allowing for analysis of impacts at the State of Victoria level.

REMPLAN uses either the value of investment or employment generation as the primary input. For this analysis, the value of total upfront investment has been used as the key input to assess the benefits of the construction phase.

- Outputs from the model include employment through the project and the economic output at the State level.
- Employment generated is calculated over the life of the construction phase; or in terms of the ongoing operations and total ongoing jobs generated.
- Both the direct and indirect benefits are modelled for employment and value added:
  - *Direct* referring to the effect felt within the industry one-year the investment. For example, the ongoing operation of the quarry would create direct jobs within the mining industry, and manufacturing industry related to the cement, lime and ready-mixed concrete industry.
  - *Indirect* effects are those felt within industries that supply goods to the industries directly affected (i.e. supply chain effects but not consumption effects). For example, this may capture the effects on catering industry employment for food and beverages procured to the site.
- It's noted that the results presented are estimates only based on the existing state of economic activity in the area. Due to the static nature of input-output modelling, there is the potential to overstate the actual effects. The approach Urbis adopts in accounting for this is presented below. Nonetheless, the analysis still reflects the fact that employment growth will be positive for the State and the local area.
- Urbis consider that in the absence of the investment package it is unlikely that similar projects would be undertaken within the same period, and therefore the investments can be considered additional.

Reporting of Modelling Results

Urbis has adopted a conservative approach to estimating and reporting economic and employment benefits using the REMPLAN modelling tool so as to not overstate the likely effects. Key areas where Urbis' approach is designed to not overstate the effects include:

- While REMPLAN defines the supply chain linkages between local industries and allows the assessment of multiplier effects as a result of a direct input into an industry, the nature of the ABS I/O Tables and indeed the set-up of the model suggests there is likely some double-counting therefore overstatement of the flow-on effects.
- More specifically, REMPLAN defines 'Indirect Effect' as consisting of both the 'Supply-chain Effect' and 'Consumption Effect'. However, Urbis believe that the consumption effect (i.e. workers with more income spend elsewhere in the economy) has already been counted to an extent as part of the supply-chain effect in the modelling process and is a more tenuous link to the direct effects. As such, Urbis have excluded consumption effect from benefit reporting and consider supply-chain effect as the only indirect effect generated from the direct input.
- Construction-related jobs are reported as FTE jobs for the period of one year, rather than the number of workers who might work on a site over the construction period which building contractors might report. For example, a project might have 200 workers on-site over the course of a two-year construction, but that may only equate to say 50 FTE jobs per year. Each trade is not onsite for the whole time (e.g. plumbers, joiners, painters etc. all come on site at different stages). Therefore, FTE for one year accounts for the total hours required by workers over the year and avoids the potential to overstate or misinterpret job figures that relate to part time workers. It also allows for direct comparison of jobs with different construction timeframes, as the jobs accrue each year over the length of construction.