Date: 30/4/2024

Memorandum

To: Dudley Clemens, Environmental Manager, J.Swap Contractors Ltd.

From: Greg Akehurst, Director Market Economics Ltd

Kieran McLean, Senior Analyst Market Economics Ltd.

Re: Katikati Quarries (2001) Limited: Katikati Quarry - Fast Track Application

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Katikati Quarries (2001) Limited ("KQL") are seeking a consent under the Fast Track Approvals Bill 2024 ***to enable the extension of*** the Katikati quarry, located Western Bay of Plenty. Given the importance of aggregate and the need for efficient supply, granting fast track consent has the potential to be beneficial. KQL has commissioned Market Economics to assess the economic effects of the proposed quarry extension, highlighting the importance of granting a Fast Track consent.

This assessment is not a full consideration of all potential economic effects. Rather it seeks to provide context around the economic benefits that would result from proposed extension as part of consideration for the Schedule 2A list of automatically referred applications. This analysis considers the quarry extension in terms of:

- The local aggregate market,
- The Impacts to supply, and
- The cost savings driven by the quarry's location relative to the market.

This assessment has taken into account the existing supply and demand of aggregate and utilises these relationships to demonstrate the expected role of KQL's Katikati quarry within the local context of the Bay of Plenty region. The analysis relies on bespoke modelling capability, which is consistent with the approach used for assessing the economics of other aggregate quarrying operations across New Zealand.

Context

Katikati Quarry has been owned and operated by KQL since 2001 and was originally established on the site in 1968. The quarry is located 6km west of Katikati at the end of Wharawhara road and backs onto and includes a portion of activity within the Department of Conservation's Kaimai forest park. The base rock is a mix of high quality andesite and ignimbrite deposits. The consent will allow an extension to the quarry which will provide access to new resource over and above the small footprint currently consented which has small amounts of high quality rock left. A Fast Track consent would mean that the operation can both access and scale up in a high demand area, where no similar quality rock exists, close to demand in Tauranga and Western Bay of Plenty. This would allow the quarry to produce concrete aggregates, sealing chip, and rip-rap for harbour erosion protection. If not granted under Fast Track, KQL consider access to resource on Crown land unlikely, based on restrictions to land access DoC have previously put in place.

Historic Aggregate Production

The availability of information on aggregate quarrying in New Zealand is somewhat limited. The New Zealand Petroleum and Minerals (NZP&M) division within MBIE collects and publishes data about aggregate production in NZ, covering national and region supply with aggregate categorised by construction purpose rather than by rock type. The NZP&M reports the results from a voluntary survey with varying response rates. The variability means that there is degree of uncertainty in the data. In 2021 and 2022, the survey response rate was around 54%, compared to an average of around 76% between 2012 and 2020. This means that some caution is needed when using the data. For example, a study by Fulton Hogan on Auckland's aggregate market (2019) suggests that the NZP&M study could be understating aggregate production by 28%. A closer inspection of the data (specifically the years with higher response rates) shows that there is some variability in the data and this variation is across commodity grouping and regionally. Therefore, the analysis considers historic ratios and the relative spread of those ratios. Based on the spread and variability, we conclude that the data is sufficiently robust to inform this assessment.

The historic aggregate production estimates for the Bay of Plenty region are shown in **Figure 1** and **Figure 2** shows the production of the Bay of Plenty and neighbouring regions over the last ten years.

Figure 1: Annual Aggregate Production (tonnes) 2000-2022

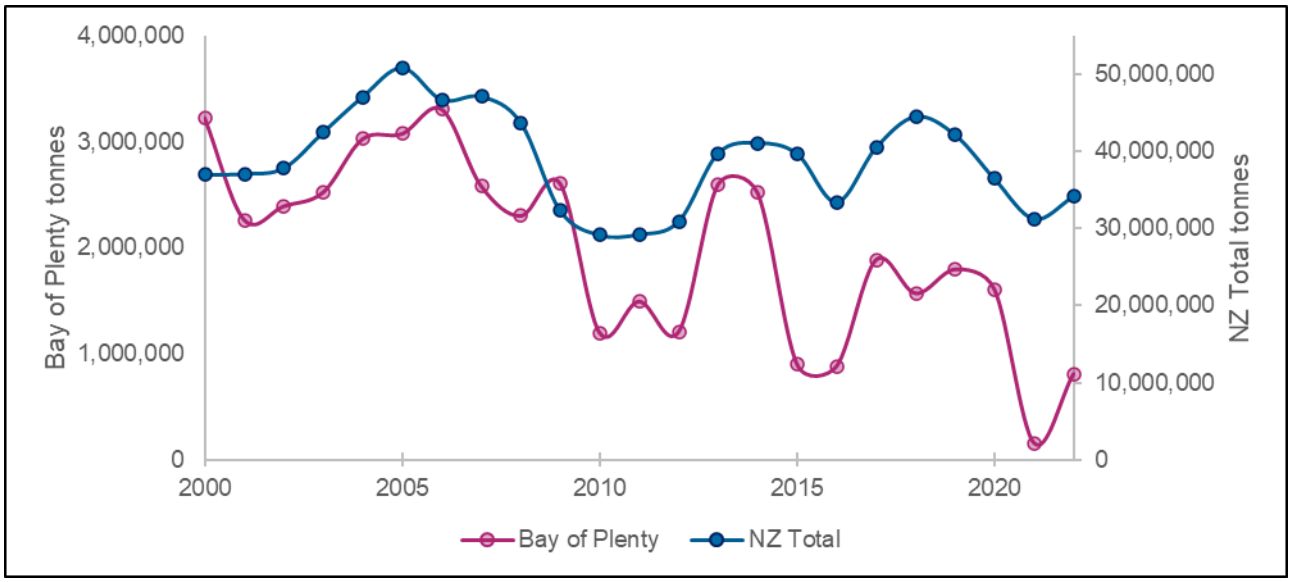

Figure 2: Annual Aggregate Production by region (million tonnes) 2013-2022

Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Bay of Plenty	2.6	2.5	0.9	0.9	1.9	1.6	1.8	1.6	0.2	0.8
Auckland	6.0	7.9	10.7	8.1	10.3	8.7	10.3	10.0	10.1	12.9
Waikato	7.8	6.3	7.5	5.7	7.9	11.5	7.2	8.8	8.6	8.4
Gisborne	0.4	0.0	0.4	0.3	0.6	0.5	0.5	0.0	0.0	0.7
Total New Zealand	**39.8**	**41.1**	**39.7**	**33.4**	**40.5**	**44.5**	**42.2**	**36.5**	**31.3**	**34.2**

The Bay of Plenty region's aggregate production is considerably smaller compared to the levels in Auckland or the Waikato. According to NZP&M data, aggregate production levels in the Bay of Plenty peaked in the early 2000s, but current levels (5-year average ending 2020) are only 1.1 million tonnes per year – half of the historic ratios. Insights from the Fulton Hogan study and other employment-based approaches suggest that these production figures could be higher, with current levels estimated between 1.3 million tonnes and 1.6 million tonnes.

As Tauranga and the Western Bay of Plenty form the main economic hub of the region, most of the region's growth is anticipated to occur there. However, due to the spatially dispersed nature of the region's economic centres, and low production of aggregate, a large volume of its aggregate requirements are imported – mostly from the Waikato Region. These requirements are related to growth in urban-economic centres as well as the maintenance of regional infrastructure, including roads throughout the region.

Aggregate Production per Capita

The historical relationships between estimated production rates and population at the national level, as well as economic performance, serve as the foundation for designing scenarios to forecast regional aggregate demand levels in the future. Statistics New Zealand provides population estimates for each Territorial Authority throughout New Zealand, which are analysed to derive the aggregate use per capita ratio.

Figure 3 shows the per capita production ratio since 2013, for Bay of Plenty, Waikato, and New Zealand overall. This ratio, along with other sources, is then utilised to estimate regional self-sufficiency in aggregate production. These ratios relate local aggregate quarry totals to population and can be seen as a metric of relative supply.

Figure 3: Aggregate Production per capita, 2013-2023, tonnes per capita

Year	Tonnes per capita per year		
	Bay of Plenty	Waikato	NZ
2013	9.3	18.4	9.0
2014	8.8	14.7	9.1
2015	3.1	17.0	8.6
2016	2.9	12.7	7.1
2017	6.1	17.1	8.4
2018	4.9	24.2	9.1
2019	5.5	14.7	8.5
2020	4.7	17.6	7.2
2021	0.5	17.0	6.1
2022	2.3	16.3	6.7

Source: Calculations based on NZP&M, StatsNZ data

The production per capita for Bay of Plenty has oscillated from a high period in 2013-2014 to a low in 2015-2016. The per capita production then rose to a level between these two points across 2017-2020 before falling in the last two years. These figures do not necessarily align with the national average as large regional infrastructure projects and events, such as the rebuilding of Christchurch, can have a significant effect on how production changes to meet demand. Therefore, any forward-looking application of the per capita ratio should not be based on a single year's data, but instead reflect a longer timeframe. In recent years it is likely that the average tonnes per capita is understating performance level due to the constraints associated with the Covid lockdowns, and the strong recovery in the post-Covid environment (that is not shown in the data).

It is evident that over the past 10 years, the *Bay of Plenty has consistently produced aggregate at a level lower than the national average. This indicates that local production is likely to be insufficient in regard to satisfying all local demand, and a portion of demand needs to be serviced using imported aggregated.*

Aggregate is a high-volume, low value[1] commodity and therefore transport costs are a key influencing factor. Generally, users will seek to minimise transport distance because the greater the distances, the more expensive the transportation becomes.

On the other hand, the Waikato has consistently produced more aggregate on a per capita basis than the NZ average and the Bay of Plenty. The Waikato's role in supporting the aggregate demands of other regions is clear. The data suggests that the Bay of Plenty in an importer of aggregate. As the Waikato is the most accessible region to the Bay of Plenty, the Waikato region's quarries provide the majority of aggregate imported to the Bay of Plenty.

Forward Looking Aggregate Demand

The relationship between the quarry (supply) and the demand levels are outlined by illustrating the relationship between supply and demand, i.e., the output gap. As established earlier, the Bay of Plenty imports a large portion of its aggregate. Importing aggregate from other regions mean that there are transport costs as well as adverse externalities associated with the transport function.

Two scenarios have been used to show the likely spread of aggregate demand over the medium to long term. The scenarios show a medium- and high-growth pathway and are based on StatsNZ's population projections. It is important to note that the high scenario is used to reflect an upper bound for the assessment and illustrates a strong growth future. It is included to ensure that the assessment does not 'undershoot' future demand levels and to ensure that sufficient resource is available in future to cater for growth.

The core drivers of the scenarios are:

- The medium-growth scenario
    - Medium population growth.
- A high-growth scenario
    - High population growth plus an additional factor to reflect shifts like higher demand arising from infrastructure reinvestment, climate change and related responses, e.g., building in resilience and rebuilding activities.

Demand projections for the two scenarios are shown in **Figure 4**. This shows total aggregate demand estimates for the Bay of Plenty. Scenario 1 reflects the medium population growth and the lower per capita demand rate. Scenario 2 uses the higher population projections and a higher pathway in terms of aggregate demand per capita (+2.5%).

The scenario outlook (demand levels) is compared against the estimated production levels (aggregate supply). If supply exceeds demand, then a region can support its own needs using internal resource. If demand is greater than regional supply, then there is a regional deficit and aggregate will need to be imported. The scenarios reflect different growth pathways and are compared against the production estimates. Importantly, it is assumed that the current production levels are maintained, i.e., no new quarries are established, and the existing quarries maintain current production. The Output gaps are shown in **Figure 5**.

[1] Aggregate is low value relative to its weight.

Figure 4: Bay of Plenty Aggregate Demand Outlook – Scenarios (million tonnes)

	2023	2028	2033	2038	2043	2048	% change 2023 -2048
Medium Growth Scenario	2.66	2.79	2.90	2.99	3.08	3.15	18%
High Growth Scenario	2.82	3.30	3.82	4.39	5.02	5.72	103%

Figure 5: Output Gaps in Bay of Plenty - Scenarios (million tonnes)

	2023	2028	2033	2038	2043	2048
Medium Growth Scenario	-1.8	-2.0	-2.1	-2.2	-2.3	-2.3
High Growth Scenario	-2.0	-2.5	-3.0	-3.6	-4.2	-4.9

The scenarios suggest that the local community growth ambitions and investment in infrastructure will translate into a widening of the sufficiency gap. That is, ***the Bay of Plenty is already in a deficit position, importing aggregate.*** Under the medium scenario, ***this gap is expected to increase over time*** from -1.8m tonnes in 2023 to -2.3m tonnes in 2048. The high growth scenario reflects an upper bound of what might occur, the inputs are valid, and it could reasonably eventuate such as during short periods of high demand. The gap in this scenario if projected to increase from -2.0m tonnes in 2023 to -4.9m in 2048. The path of aggregate demand growth, and therefore the sufficiency gap, is expected to fall somewhere in between the modelled growth scenarios.

Costs and Benefits of KQL's Katikati Quarry

The availability of aggregate and the capacity of aggregate resources to meet market demand are key drivers of the direct and indirect economic impacts of various sources. These economic impacts encompass costs such as increased transport costs and externalities like emissions. On the benefit side, potential effects may include security of supply and avoided costs.

The economic effects of quarrying operations are closely linked to the transport function, which is influenced by the location of the quarry and the destination of the aggregate. This section outlines the key assumptions underpinning the analysis. These assumptions are presented to provide visibility of the metrics used to estimate the costs and benefits of maintaining the supply of the Quarry. The costs and benefits are viewed as the net change relative to a without KQL Katikati Quarry situation. Avoided costs are a benefit, they include;

- Transport costs
- Environmental costs
- Social costs.

The costs and benefits of extending the life of the Katikati quarry are assessed against its principal alternatives. In this case, we anticipate that supply from the Katikati quarry will displace rock brough in over the Kaimai Ranges from Waikato.

The Katikati quarry provides a source of aggregate to meet demand in the Western Bay of Plenty, Tauranga and the Coromandel. Distance from the Katikati quarry to the main centres within its catchment as well as for potential alternatives outside of the region are shown in Figure 6.

Table 5: Distances of Potential Alternate Quarries

Quarry	Katikati	Tauranga		Whangamata
		Crossing / Tauriko	Omokoroa	
Katikati	8	39	22	61
Bay of Plenty Suppliers				
Corbet Road	32	67	51	27
Poplar Lane (Stevensons)	56	24	36	109
Hyndman Quarry	98	63	78	103
Matamata, Barton Road	73	38	53	110
Welcome Bay	44	14	26	98
Alternatives outside of Bay of Plenty				
Karepiro	87	56	71	126
Whitehall (Winstones)	99	65	80	129
Smythes	84	121	101	91

The principal alternatives are the large Waikato based quarries. The benefits of allowing Katikati to proceed are the transport cost savings achieved by replacing this rock. As KQL are currently in the process of ascertaining the potential annual production and total yield of the resource from the quarry extension total volumes are not known. Therefore, this analysis considers the costs per 100,000 tonnes of aggregate that might be replaced by the Katikati quarry.

Using the additional distances, the main transport assumptions are for a truck size of 30 tonnes and a cost of $0.38 per km tonne. The cost factors for emissions and social costs are described in **Figure 6**.

Figure 6: Emission and Social Cost Factors

	Emission costs and factors				
	CO	NOx	PM2.5	VOC	CO2-e
Cost/tonne (Rural)	$0.23	$28,843	$58,880	$73	$94
Cost/tonne (Urban)	$5.84	$1,038,788	$1,024,422	$47,193	$94
Emissions factors 2023 (g/tonne) Diesel Articulated	1.36-1.37	4.58-4.67	0.17-0.18	0.13	675.78-720.13

	Social Costs		
	Death	Serious injury	Minor Injury
Social cost ($ per instance @2023 prices)	$14.2m	$0.7m	$0.08m
Deaths/Injuries per 100 million km (risk factor)	2.5	4.3	17.5

The cost of aggregate movements associated with the quarry is assessed using the above assumptions and per 100,000 tonnes of aggregate per annum. The results are reported for the main sub-markets (Katikati and Tauranga). **Figure 7** reports the additional costs of the alternative quarries.

Figure 7: Cost of Alternatives per 100,000 tonnes of Aggregate

Quarry	Driving distance (km)	Transport costs	Social costs	Emissions costs	Total costs
Delivering to Katikati					
Additional from Taotaoroa	527,000	$6.0m	$0.2m	$0.1m	$6.3m
Additional from Whitehall (Winstones)	607,000	$6.9m	$0.3m	$0.1m	$7.3m
Additional from Smythes	507,000	$5.8m	$0.2m	$0.1m	$6.1m
Delivering to Tauranga Crossing/Tauriko					
Additional from Taotaoroa	113,000	$1.3m	$0.0m	$0.0m	$1.4m
Additional from Whitehall (Winstones)	173,000	$2.0m	$0.1m	$0.0m	$2.1m
Additional from Smythes	547,000	$6.2m	$0.2m	$0.1m	$6.6m

Based on the above transport, environmental and social costs that would be avoided by enabling the Katikati quarry extension is valued at $6.1m to $7.3m per 100,000 tonnes per annum, to supply the Katikati sub-market and between $1.4m to $6.6m per 100,000 tonnes per annum for Tauranga.

Another way to consider the cost savings is to consider the total current volume of imported material to Tauranga. From the 2018 census[2] the population of Tauranga was listed at 136,713. Using the 2018 NZ average production / consumption rate of 9.1 tonnes per person, Tauranga consumed a total 1.2m tonnes of aggregate per annum. With Bay of Plenty production of 4.5 tonnes per person, the total annum shortfall was 4.2 tonnes per person, equating to a total annual (imported) shortfall of around 574,000 tonnes.

At a maximum, if all of the imported product was supplied from Katikati quarry, the cost savings would be 5.7 times per 100,000 tonne figures described above. That is between $8.0m and $38m per annum. Due to the geographical spread of the city, it is unlikely that total imported product would be supplied from the Katikati Quarry, however opportunity is present to supply greater than 100,000 tonnes per annum and significantly decrease the transport, social and emission costs.

This results in a significant regional benefit from a Fast Track consent.

The base case analysis (per 100,000 tonnes of aggregate from Katikati not the Waikato) estimates economic benefits (in the form of avoided costs) that accrue to Bay of Plenty's economy – and ultimately households. In particular, the results highlight the importance of the Katikati quarry for supplying the sub-markets of Katikati and the Western Bay of Plenty. Avoiding these direct transport costs will support the Bay of Plenty aggregate market by:

- Addressing a portion of the aggregate shortfall, thereby providing significant support to the construction sector by reducing costs and providing an alternative source; and
- Helping with cost management by providing an easier to access resource that is close to end-users, and thereby reducing transport costs, which will ultimately end up reducing cost pressures for households.

Concluding Remarks

Efficient and sustainable access to aggregate will be an important factor in both facilitating and providing infrastructure such as roading, buildings, and other infrastructure to support Bay of Plenty's growing

[2] Retrieved 01.05.24 from URL: https://www.stats.govt.nz/tools/2018-census-place-summaries/tauranga-city

population and economy. **Figure 8** provides commentary illustrating how Stage 3 aligns with the eligibility criteria as outlined in Clause 17(3). The presence of the aggregate close to where it is needed, and the ability to access it sustainably contributes significantly to the economic wellbeing of the Bay of Plenty region.

Figure 8: Alignment with Fast Track Legislation Criteria

Eligibility criteria Clause 17(3):	Comment
(b) will deliver regionally or nationally significant infrastructure	Aggregate is an essential ingredient of concrete, and concrete is needed across the entire urban landscape. Aggregate is also used in raw format across a range of other non-concrete uses. KQL's Katikati Quarry provides the ability to avoid the adverse effects of a local shortfall in aggregate by substituting imported rock for locally quarried aggregate. This will support the local market and place downward pressures on the costs of aggregate, and reduce the transport load.
(d) will deliver significant economic benefits	Supplying the Bay of Plenty market using the Katikati Quarry, instead of importing aggregate from Waikato quarries will avoid considerable costs. The avoided costs are seen as benefits and the analysis shows that the value of these avoided costs per 100,000 tonnes is at least $6.1m to Katikati and at least $1.4m to Tauranga per annum. Avoiding these costs translates into a significant economic benefit.
(f) will support development of natural resources, including minerals and petroleum	In the Bay of Plenty region aggregate demand is greater than local supply, with a large share of demand satisfied by importing aggregate from outside the region. Ensuring the long term future of the Katikati resource/mineral is consistent with developing resources in a responsible and efficient way.
(g) will support climate change mitigation, including the reduction or removal of greenhouse gas emission	Minimising the distance that aggregate, and concrete, travels to end users ensures that the associated emissions are kept to a minimum. The analysis illustrates large effects of transporting aggregate on emissions. This proposed project will have an immediate, and direct impact on reducing emissions. The project will deliver a step-down in emissions and given the long project lifecycle will ensure that locally generate emissions is minimised.
(h) will support adaptation, resilience, and recovery from natural hazards	Apart from ensuring that there is enough aggregate to support growth in the Bay of Plenty, enabling the project will enhance the market's resilience because key supply sources will be within the region, and not subject to infrastructure connections into the Bay of Plenty region. In a post-disaster situation, reinstating infrastructure as fast as possible is crucial. It is plausible that the natural event that caused widespread damage could also damage transport infrastructure. Developing and maintaining multiple sources for aggregate is prudent.

Yours sincerely,

Greg Akehurst Kieran McLean

Katikati Quarry – Fast Track Referral Project

Summary of actual or potential adverse effects on the environment

Many of the known and anticipated adverse effects of the project are those typically associated with the expansion and operation of a quarry. The effects associated with ecology are of significance and are addressed below.

The applicant has received advice from a number of technical experts in preparing this summary.

At a high-level, the actual or potential effects are:

- **Effects on conservation and biodiversity values** – the project will involve the loss of indigenous vegetation and habitat for fauna. There is a high level of existing information as to the nature and extent of vegetation and fauna within the area of the expansion. This has been surveyed several times by a range of submitter's ecologists. The submitter looks forward to engagement with the Department of Conservation to discuss offsetting and mitigation options, which in the Department's view, may be sufficient to identify methods by which adverse effects can be addressed so that they are acceptable. It is identified that effects without mitigation, offsetting or compensation would be significant.
  A resource consent application would provide:
  - A detailed evaluation of the values of the fauna (birds, lizards, bats etc) and flora to determine areas where expansion should be avoided (because their values are of such significance) and those where fewer adverse effects would result and opportunities exist to address those effects.
  - A comprehensive package of off-setting, mitigation and compensation measures with the future resource consent application.
  - A plant and animal pest management plan.
  - A lizard salvage management plan.
  - An avian management plan to manage vegetation clearance outside the bird nesting season.
  - Should bats be identified, a bat management plan to manage vegetation clearance.
  - Any new planting areas to revegetate land.
  - A mitigation plan to address the loss of habitat and biodiversity values.
  - A revision of the current rehabilitation (end use) plan for the planting of the site at the completion or the works stages and/or closure of the quarry.
- **Erosion and sediment loss** – these effects will continue to be managed as per measures for the existing quarry operation to comply with district plan and regional plan rules, and best practice methodologies. This includes sediment retention ponds, dirty water diversions and the use of the quarry pit itself as a sump. An updated Earthworks Management Plan and Quarry Management Plan would address the approaches to annual erosion and sediment control measures, along with the manner in which erosion and sediment control measures are implemented with the expansion of the quarry pit. The measures associated with the existing processing areas are well established and already consented, and therefore there is no need to change these. Currently site stormwater treatment systems are being upgraded in accordance with resource consent requirements.
- **Air quality and dust effects** – these will continue to be monitored and managed through the checking of weather conditions, control of vehicle speeds within the site (maximum 30km/h), dampening of haul roads, adopting good blasting practices such as the wetting of rock faces and tight controls on the quantities of explosives and use of sequential firing, use of watercarts and fixed sprinklers. The area is relatively remote and benefits through the lack

of dwellings and neighbours. The measures associated with the existing pit, haul roads and processing areas are well established and already consented, and therefore there is no need to change these. An updated Quarry Management Plan would extend these measures to apply to the expansion area.

- **Effects on freshwater** – appropriate setbacks from the streams/wetlands will be detailed in the site plan for both reserves, to provide a buffer between the quarry operation and these features. Erosion and sediment control measures as detailed above, including where necessary chemical treatment of stormwater, would be utilised to minimise the discharge of sediment

  The establishment of the second pit will necessitate stream diversion works to provide for access to the regionally significant aggregate resource. A resource consent application would provide:

  - A detailed evaluation of the aquatic values of the stream.
  - Details demonstrating the design of the new permanent stream channel.
  - A comprehensive package of mitigation measures.
  - A fish salvage plan.
  - A plan to recreate stream morphology and function (hydrology) with the diversion.
  - A plan to plant and fence riparian margins on both sides of the stream.

  The type of stream diversion works described above have already been established for significantly larger scale stream diversions such as the Karapiro Stream at Whitehall Quarry. This project will adopt a similar approach to align with the quarry industry's well-established best practice methodologies to ensure there will be no net loss of ecological values and that the design of the new stream channel will achieve and maintain positive ecological and hydrological outcomes.

- **Effects on groundwater** – should groundwater be diverted with the pit design, then the application would prepare an assessment of effects on groundwater associated with the hydrology of the adjacent stream and any effects on groundwater bores within proximity to the site. It is noted that due to the remote nature of the area, interaction with other bores is unlikely and has not been encountered to date.
- **Acoustic Effects** – All noise associated with quarry works will continue to be suitably managed to comply with district plan standards. The quarry and intended areas of expansion are well separated from adjacent dwellings. An acoustic assessment would be provided with the application to confirm compliance with the District Plan standards.
- **Vibration and Blasting Effects -** The quarry and intended areas of expansion are well separated from adjacent dwellings and vibration concerns have not arisen with the existing operation. A vibration and blasting assessment would be provided with the application to confirm compliance with the District Plan standards.
- **Transportation Effects** – the quarry has been operating since the 1960s and is well established. The road has been progressively upgraded to cater for trucks. If an increase in truck volumes is to occur, then a traffic assessment would evaluate the existing roads and records of any crashes that point to a deficiency in the road network, along with the capacity of the road network to accommodate the additional volumes.
- **Effects on and from natural hazards** – the site design will ensure that areas of overburden and the pit design does not create instability effects.
- **Landscape, natural and rural character and visual amenity effects** – the quarry does not have a wide viewing audience from the surrounding rural environment. The adjoining areas are either the Kaimai ranges or lower density rural. The quarry is relatively discrete, being located at the end of a road. The spurs and ridges running down from the Kaimai ranges

contain views of the site to the immediate environment. The expansion areas are towards the north and south of this ridge, and with appropriate staging can be hidden by existing flanking topography or surrounding hillslopes, so would not be generally visible beyond the existing quarry footprint and discrete areas of the immediate surrounds. This minimises the ongoing visual landscape effects of the activity. Ultimately with the cessation of quarry activities, the site would be rehabilitated to minimise effects on the wider landscape. This would involve stabilisation, regressing and revegetation as necessary.

- **Cultural heritage, effects on Mana Whenua Values and archaeology** – the applicant has previously consulted/engaged with relevant iwi for previous consent applications, and maintains a positive relationship through the existing Quarry Engagement Group. The quarry will continue to work collaboratively with iwi through these next stages, including preparation of the consent application. The Quarry Engagement Group is involved in the ongoing monitoring of the quarry operation.
  No archaeological sites are recorded with the site. Accidental discovery protocols will be implemented should earthworks reveal any unrecorded archaeological sites.
- **Effects on highly productive land** – LUC mapping confirms that no land within the site is considered to be “Highly Productive Land”.