

**IN THE MATTER** of the Resource Management Act  
1991

**AND**

**IN THE MATTER** of a resource consent application by  
GBC Winstone to Whangarei District  
Council dispose overburden on the  
Pegram site.

**STATEMENT OF EVIDENCE OF MICHAEL GOURLAY HARRIS**  
**ON BEHALF OF GBC WINSTONE**

**1. INTRODUCTION**

**Qualifications**

- 1.1 My full name is Michael Gourlay Harris. My professional qualifications are a Bachelor of Science Degree and a Postgraduate Diploma in Science (with Credit) in Geology, both from the University of Otago. I am a Chartered Engineer and a Chartered Geologist, a Fellow of the Geological Society (London), a Member of the Institute of Materials Mining and Metallurgy, and an Associate Member of the Institute of Quarrying.

**Experience**

- 1.2 I am employed by GBC Winstone as an Engineering Geologist, a position I have held since September 1998. I have 35 years postgraduate experience within the geological and quarrying industry. My responsibilities within GBC Winstone involve both geological and engineering geology investigation and evaluation, surface and groundwater evaluation and management, and site development projects.
- 1.3 I confirm I am authorised to give evidence on behalf of GBC Winstone.

## **Statement of Evidence Background**

- 1.4 I have been involved in the geological investigations, overburden disposal and quarry pit development planning at Otaika Quarry, and development and planning for the adjacent proposed overburden disposal area on the Pegram Block in respect of the current resource consent application (“the proposed OBDA”) specifically this has involved:
- (a) The initiation, supervision and review of geological and geotechnical investigations at Otaika Quarry and the Pegram Block;
  - (b) Quarry pit and OBDA designs for Otaika Quarry;
  - (c) Planning and design of the OBDA on the Pegram site; and
  - (d) Design of the Erosion and Sediment Control mechanisms to be employed onsite.
- 1.5 I confirm that I have read the statement of evidence of Mr Edmonds, Mr Wallace, Mr Hansford and Mr Lines to which I will cross-refer. My evidence will focus on the quarry development planning associated with the Otaika Quarry resource, the development and design of the OBDA on the Pegram Block, and elements of that proposal.
- 1.6 I also confirm that I have read the submissions to the application, and the Officers Report for the Hearings Commissioners dated 20 March 2018.

## **2. OTAIKA QUARRY SITE BACKGROUND**

- 2.1 Extensive geological investigations and quarry pit planning has been undertaken at Otaika Quarry to determine the quarry development required to continue producing a range of aggregate products for the Whangarei and Northland market.
- 2.2 Geological investigations and pit development planning undertaken at Otaika Quarry have demonstrated that reserves of high quality rock within the current quarry pit footprint are primarily constrained by the ability to dispose of overburden within the MEA Active Area, due to the long life of the quarry and fact that overburden has been disposed within

the MEA Active Area since quarrying commenced means that almost all of the suitable areas for overburden disposal within the MEA Active Area have been exhausted.

- 2.3 Overburden deposited within the MEA Active Area since the mid 1980's will require double handling to fully develop the quarry pit to its long term potential. Placing overburden in the quarry pit (backfilling) will sterilise access to the future resource within the pit due to the requirement to expand the pit prior to being able to fully realise resource below the current pit floor.
- 2.4 Geological investigations and pit development planning undertaken at Otaika that I have been involved in have shown that there is workable resource at the quarry, suitable for the manufacture of high quality aggregates, with an estimated life span in the order of 100 years (depending on market demand).
- 2.5 In 2006 GBC Winstone purchased back the adjacent site known as the Pegram Block, one of the reasons for doing so was to provide for the long term placement of overburden in the Pegram Block from the quarry.

### **3. SCOPE AND STRUCTURE OF EVIDENCE**

- 3.1 I have structured my evidence as follows:

#### **Quarry Pit Planning at Otaika Quarry in respect of Overburden:**

*What is overburden;*

*Historic placement of overburden at Otaika;*

*Constraints of continuing to place overburden within the MEA Active Area;*

*Quarry Pit development including overburden volumes; and*

*Efficient use of site.*

#### **Development and Design of the Pegram Block OBDA:**

Suitability of the Pegram Block for placement of overburden;

Design parameters for OBDA on the Pegram Block;

Design Principles to Minimise Potential Environmental Effects;

Geotechnical Stability and Management of Surface and Groundwater;

Access to the MEA Active Area;

Staging Development to Enable Overburden to be placed in an Efficient and Practical Way; and

Methodology to Manage Surface Water Flows and Erosion and Sediment Control.

**Description of Works:**

Haul Road;

Enabling Works;

Stripping and Storage of Topsoil;

General Works;

Traffic Generation and Vehicle Movements;

Effects; and

Conditions.

**Regional Consents:**

**Matters Raised by Submitters:**

*Otaika Quarry 2005 Mineral Extraction Management Plan;*

*Haul Roads;*

*Effects on groundwater seepages and hydrology;*

*Effects on Limestone Caves; and*

*Alternative Uses of Overburden.*

**Section 42a Report to the Hearing Commissioners:**

*Backfilling Quarry Areas;*

*Completion of all Works within 55 dBA;*

*RPS – Sterilisation of the Resource;*

*Enabling Works Limits;*

*Alternative means of carrying out the proposal;*

*Options; and*

*S42a Report – Proposed Conditions of Consent*

## **Summary and Conclusions.**

### **4. QUARRY PIT PLANNING AT OTAIKA QUARRY IN RESPECT OF OVERBURDEN**

#### **What is overburden**

- 4.1 Overburden is material overlying the greywacke resource and comprises topsoil, clay, greensand, limestone and highly weathered greywacke. Due to the physical characteristics of overburden (i.e. maximum particle size, moisture content, clay content), and the cost to transport it off-site, it is generally not suitable for large scale commercial uses such as engineered fill. There is very low demand for the use of this material and presently only very small volumes of overburden from Otaika quarry are used off-site for bulk fill. Limestone boulders are occasionally taken from the site for use in landscape works, to stabilise road embankments, or for river or sea protection.

#### **Historic placement of overburden at Otaika Quarry**

- 4.2 Overburden arising from quarry operations prior to the mid 1980's was placed to form a stockpile and processing area to the northeast of the quarry pit (current lower stockpile area and quarry entrance), to the east of the quarry pit (high ground immediately to east of pit), and to the south-east of the pit (regenerating vegetation boundary to Otaika Reserve).
- 4.3 Since the mid 1980's overburden has been placed in an OBDA located within a large gully immediately to the northwest of the quarry pit, to build up the upper stockpile area north of the pit and along the western boundary of the MEA Active Area. Overburden has also been placed to form a screening bund to the lower stockpile area.

#### **Constraints of continuing to place overburden within the MEA Active Area**

- 4.4 Overburden disposal areas are required to be designed according to the geotechnical strength of the overburden material and the foundation material. These strength parameters have generally limited overall slope angles to 10 to 12 degrees. Individual slopes can be steeper however this requires both selection of material and foundation improvement.

- 4.5 The capacity of an OBDA depends on both the geometry and slope of the existing ground surface. A gully can be filled by building a toe retaining bund (with foundation preparation and selected overburden material) to retain reasonably significant volumes of overburden. A sloping surface (as is present along the southwestern side of the MEA Active Area) has very limited capacity for overburden disposal due to geometry and slopes approaching OBDA design surfaces.
- 4.6 Sloping surfaces approaching OBDA design surfaces need both a toe retaining bund and shear key, and side bunds and shear keys, to be constructed prior to placing the overburden with the thickness of the overburden able to be placed depending on the height of the toe bund. As a result, on a sloping surface approaching OBDA design surfaces, significant volumes of material are required to build the retaining bunds compared with the volume of overburden able to be retained.
- 4.7 Opportunities for overburden disposal within the MEA Active Area are near exhaustion. Currently overburden is being removed and placed in a small area to the north west of the pit. Storage capacity in this area is limited and can only accommodate a small amount of overburden. This area sits on top of unquarried aggregate resource, earmarked for future extraction. As a result, all overburden currently being placed in this area will need to be re-handled – placed and then moved when extraction reaches this point.
- 4.8 There are also areas of the MEA Active Area (quarry pit, stockpile area, processing plant area, water storage and treatment areas, quarry entrance) which are required to be maintained in their current use to continue to operate the quarry. As such, overburden is not able to be placed in these areas.

#### **Quarry Pit Development including Overburden Volumes.**

- 4.9 Quarry pit development will consist of a westwards development of the pit (eventually to the western boundary of the MEA Active Area) with some northwards development into the upper stockpile area. Some minor eastwards development of the quarry pit is also proposed. As this development progresses the quarry pit floor will be excavated below current floor levels. For this development to occur, overburden removal

will continue with over 2 million cubic metres of overburden being required to be excavated in the next 35 years.

- 4.10 As will be discussed by Chris Edmonds in his evidence, overburden disposal is closely related to quarrying and needs to occur in close proximity to the quarry pit.
- 4.11 No other site within the necessary proximity is available to Winstone Aggregates. Otaika quarry is bordered by the Ruarangi Block, Department of Conservation Reserve Land, Pompellier Estate and Otaika Recreation Ground. As I have described above, the MEA active area cannot accommodate any more significant volumes of overburden. The only option(s) available to Winstone Aggregates are:
- (a) To obtain consent for the disposal of overburden on the Pegram Block; or
  - (b) Commence in-pit disposal of overburden.
- 4.12 Winstone Aggregates does not wish to commence in-pit disposal of overburden at this point in time. The latest quarry design investigations show that the pit has not yet reached its final depth and (subject to obtaining further consents) there is in the order of 100 years of quarriable resource remaining at Otaika.
- 4.13 If the quarry pit had to be used for overburden disposal (in-pit disposal), quarrying would become uneconomic and the quarry may need to close in 15 years or so from when in-pit disposal commenced, as detailed in the evidence of Chris Edmonds.

- 4.14 In this context, it is important to note that the operational life of the quarry is reduced and becomes waste bound from the point at which it is decided to begin in-pit disposal (i.e. possibly from 2019 if consents for Pegram are not obtained) as opposed to the date that the quarry closes. This is because a significant proportion of the overburden deposited in the pit would have to be removed prior to recommencing excavations for aggregate production. Premature closure of the Region's largest quarry, due to inability to dispose of overburden, would most likely result in a shortage of high quality aggregate resource, not only in Whangarei but also in the wider Northland area.

#### **Efficient Use of Site**

- 4.15 The use of the Pegram Block as an OBDA is an efficient use of land as it assists with maximising development of the quarry resource present at Otaika Quarry. Quarry resources can only be quarried where they occur, maximising the development promotes sustainable development of a resource. Full development of a quarry site reduces the requirement to look elsewhere for aggregates required to sustain the development of the surrounding area.

### **5. DEVELOPMENT AND DESIGN OF THE PEGRAM BLOCK OBDA**

- 5.1 I have been involved in the development of the design of the Pegram Overburden Disposal Proposal. The following key factors have guided the design:

#### **Suitability of the Pegram Block for placement of overburden.**

- 5.2 The Pegram Block is suitable for the placement of overburden due to its proximity to Otaika Quarry, its gently rolling contour, and its relative dimensions. This has resulted in a site located within easy distance of the quarry pit with the capacity for the placement of a meaningful volume of overburden while still being able to be easily contained within the existing landscape. In addition, overburden placement in the Pegram Block is not constrained by adverse geotechnical or hydrological conditions.

### **Design Parameters for OBDA on the Pegram Block**

- 5.3 Proposed overburden placement in the Pegram Block will use design and construction parameters and methods developed to place overburden within the Otaika Quarry since the mid 1980's. The general concept is to place overburden behind an engineered bund (incorporating a shear key) with subsurface drainage installed to avoid the build-up of groundwater pressures within both foundation and placed materials. Surface water is diverted firstly under and then around the earthworks.
- 5.4 I was involved in the initial development of this design at Otaika Quarry and have used this general design successfully at several other Winstone Aggregate sites.

### **Design Principles to Minimise Potential Environmental Effects**

- 5.5 The development has been designed to mitigate effects on the environment. The works will be staged and progressively undertaken forming final surfaces as they are undertaken. This allows the site to be progressively rehabilitated and also generally results in the works progressively becoming more distant from neighbouring dwellings. The extent of the footprint has been minimised with the greatest depth of overburden being placed on that part of the site that can best accommodate it with the working area being restricted to 3.0ha to reduce the potential for adverse discharges of storm water and dust, in addition to reducing the visual impact. The progressive rehabilitation will also reduce these potential effects.

### **Geotechnical Stability and Management of Surface and Groundwater**

- 5.6 The design of the Pegram OBDA is based on GBC Winstone's considerable experience of overburden placement at Otaika Quarry and elsewhere. The design has involved the input of geologists, geotechnical engineers, mining engineers, and a surface and ground water hydrologist. Shear keys and retaining bunds have been designed to increase the stability of the OBDA, the management of surface and groundwater has been incorporated into the design to ensure both control of site water and to avoid the build-up of groundwater pressure in the OBDA.

### **Access to the MEA Active Area**

- 5.7 Access to the MEA Active area will be via a dedicated haul road purpose built for the transport of overburden. This will allow the efficient transport of overburden from the MEA Active Area to the Pegram OBDA. Development of the Pegram OBDA has been planned so that only one alignment of the haul road is required over the life of the OBDA.

### **Staging Development to Enable Overburden to be placed in an Efficient and Practical Way**

- 5.8 The development of the OBDA has been staged in a systematic way to allow the progressive placement of overburden and rehabilitation of completed slopes as the development proceeds. This involves working from the toe and building on material placed in the previous earthworks campaigns. It avoids the reworking of final surfaces and allows works to be undertaken in a restricted area.

### **Methodology to Manage Surface Water Flows and Erosion and Sediment Control**

- 5.9 As enabling works are completed, the working area will be raised with storm water arising from the working area reporting to rear of the OBDA to be piped beneath the placed fill or directed around the fill. This avoids the discharge of storm water from working areas over the steeper front batter slopes. In addition temporary ponding areas on working surfaces will be located to reduce peak flows of storm water from the working area. Additional controls on surface water flows i.e. bunds around working areas will prevent the uncontrolled discharge of storm water from the site. These controls are detailed in the Erosion and Sediment Control Management Plan for the development and the individual Erosion and Sediment Control Plan for each earthworks campaign.

## **6. DESCRIPTION OF WORKS**

- 6.1 The works are required for the deposition of overburden arising from Otaika Quarry. 2.4million m<sup>3</sup> of overburden is proposed to be placed in the Pegram Block. This will occur in two distinct phases being an “enabling works” phase and a “general works” phase.

- 6.2 The overburden will be placed in distinct earthwork seasons at three to five year intervals with each earthworks season being some 6 to 8 months in length over the duration of 35 years generally over the months of October to April. The actual timing and extent of each earthworks season will depend upon market conditions as these will influence the amount of rock required to be exposed in the quarry. As a result the overburden placement is an infrequent and temporary re-occurring activity, with no works occurring on site for much of the consent.

### **Haul Road**

- 6.3 Access to and from the overburden disposal area will be via a haul road from the quarry operational area. This haul road will extend into the overburden disposal area at the western most corner of the Pegram Block, traversing eastwards away from residential dwellings located further along the western boundary of the Pegram land.
- 6.4 The main haul road will be approximately 20 m wide with a dual carriage way. Temporary haul roads may also need to be constructed leading from the main haul road to the site. The temporary haul road shifts over time to enable efficient access to the enabling works or overburden campaign. The temporary and main haul roads will revert back towards the west as overburden placement progresses. All roads will be inspected regularly by the site supervisor and be well maintained and watered to minimise dust.
- 6.5 Haul roads will be used by dump trucks carrying material from the Otaika Quarry to the OBDA. Dump trucks will be stored and re-fuelled within the MEA Active Area, there will be no fuel storage within the Pegram Block. Some equipment (bulldozers and excavators) will be re-fuelled via mobile tanker.

### **Enabling Works**

- 6.6 The development includes an initial enabling works phase with the construction of the haul road from the quarry operational area, the clearance of soils and vegetation, the construction of a shear key and a toe buttress retaining bund, the installation of subsurface drainage, the placement of material and drainage at the base of the OBDA, and the formation of a surface water diversion channel. These are preparatory works that “lock” the overburden in place, designed to provide a solid

foundation and ensure stability of the overburden placed on top. The enabling works phase will be completed over the first 2 earthworks seasons (depending on weather conditions) and involves large volumes of earthworks compared to subsequent general works phases. The Applicant decided it was preferable to complete enabling works in close proximity to residents of Acacia Park as soon as practicable to minimise the duration of activities close to these residents.

6.7 Enabling works will include:

- (a) Securing the site, placement of signage along the boundary with Grove Lane and Acacia Park and the commencement of amenity screen planting;
- (b) Progressive stripping of vegetation and storage of topsoil;
- (c) Progressive construction of the haul roads;
- (d) At the toe area of the OBDA, excavation of unsuitable materials, construction of the shear key and toe buttress and placement of matted fill;
- (e) Filling and placement of matted filling material in a broad gully system including an unnamed tributary of the Te Waiiti Stream;
- (f) Diversion of the an unnamed tributary of the Te Waiiti Stream and creation of a new stream channel with riparian rehabilitation works;
- (g) Installation of site drainage works including sub-surface drainage network; and
- (h) Sediment and erosion control measures including devices for the control, treatment and discharge of storm water.

6.8 Enabling works in some shape or form are required for most, if not all, overburden disposal areas. These works necessary for the safe and efficient operation of an overburden disposal area and to ensure both the short term and long stability of an overburden disposal area as discussed in the evidence of Mr Lines.

### **Stripping and Storage of Topsoil**

- 6.9 Topsoil will be striped as required, for the construction of the haul road, shear key, and bund and for placement of foundation material. They will be excavated and stored on site in mounds for the progressive use for rehabilitation of final surfaces. It is proposed that soil mounds will not exceed 3m in height and will be managed to avoid generation of nuisance dust. Soils may also be excavated and placed directly on completed slopes.

### **General Works**

- 6.10 When the enabling works phase is completed, the 'general works' phase will commence and overburden material from the quarry will be placed in layers to form an overburden disposal area building on material placed in the enabling works. Operational works will be undertaken in earthworks campaigns at 3 to 5 year intervals (depending on market demand for aggregate) placing approximately 300,000 m<sup>3</sup> of overburden and progressively building on previous works until the Pegram OBDA is completed.
- 6.11 General works comprise of overburden being placed in layers with the surface of the overburden gently sloping back to the west. Top soils will be progressively excavated as the development proceeds and stored in topsoil mounds or placed directly on completed slopes. Surface and subsurface drainage will be progressively extended as these works are undertaken.
- 6.12 The placement of overburden will occur in the following sequence:
- (a) Topsoil will be stripped and stored in a topsoil storage mound or placed directly on completed slopes;
  - (b) Surface and sub-surface drainage will be extended;
  - (c) Trucks will travel from the quarry and place the overburden in the current campaign area;
  - (d) A bulldozer will move the overburden into place;
  - (e) Final slopes will be contoured, topsoil will be spread, and

- (f) The area of overburden placement will be stabilised.
- 6.13 Works will be supervised to ensure that the overburden is placed in the correct location and form. The maximum active working area that will be no more than 3 hectares, excluding haul roads, batter slopes and topsoil mounds. At the completion of each campaign, the final surfaces will be spread with topsoil and grassed/hydro-seeded. Any uncompleted surfaces will be hydro-seeded. Haul roads will be left open between campaigns. The final surfaces will be left undisturbed until sufficient grass growth has established. Trees will be planted on the overburden faces at the end of subsequent phases of overburden placement and light grazing will be permitted to establish the pasture.
- 6.14 The hours of operation sought for the overburden placement are:
- (a) Enabling works – 7.30am to 6pm Monday to Friday, and 7.30am to 2pm Saturdays;
- (b) General works – 7am to 6pm Monday to Friday, and 7am to 2.30pm Saturday.
- 6.15 There will be no placement of overburden works outside these hours including on Sundays and public holidays.

#### **Traffic Generation and vehicle movements**

- 6.16 The proposal will generate traffic movements between the Otaika Quarry and the Pegram Block. It is anticipated that there will be five trucks operating at any time with an estimated 16 tips of overburden per hour. During the enabling works phase supplementary equipment including additional trucks will also transport materials from the quarry. A watercart will be onsite for dust suppression purposes, and a grader will be used to maintain the roads. There will be no traffic movements generated beyond the quarry and the Pegram Block apart from additional topsoil that may be required as part of the site rehabilitation.
- 6.17 Final landform (including rehabilitation) is anticipated to be completed in approximately 35 years (based on current market demand for aggregate) and will continue to be pasture and grazing.

**Effects**

- 6.18 The effects of the proposal have been assessed and are described in the evidence of GBC Winstone staff and consultants to follow.

**Conditions**

- 6.19 The Company has proposed a full suite of draft conditions for the land use consent which require:
- (a) An Overburden Management Plan;
  - (b) Riparian Management Plan;
  - (c) Landscape Rehabilitation Plan;
  - (d) Dust Management Plan;
  - (e) Proposed conditions to manage noise and hours of operation;
  - (f) Control stockpiling on site;
  - (g) Provide for an accidental discovery protocol briefing; and
  - (h) Pre-works communication and complaints register.
- 6.20 These are further discussed in the application and in the evidence of Ms Clarke.

**7. REGIONAL CONSENTS**

- 7.1 Regional consents have been granted for key components of the project (expiring 31 March 2052) including:
- (a) Placement of overburden from Otaika Quarry, including within a Riparian Management Zone and over the bed of an unnamed tributary of the Te Waiiti Stream;
  - (b) The diversion of unnamed tributaries of Te Waiiti Stream and storm water from land disturbance activities;
  - (c) The placement of drainage within the bed of intermittently flowing streams beneath the overburden fill site;

- (d) The discharge of storm water to water from land use disturbance activities.

7.2 An Erosion and Sediment Control Management Plan has been prepared for the Pegram OBDA, and submitted to the Northland Regional Council, which details sediment control methodology to minimise the discharge of sediment laden storm water from the works. An Erosion and Sediment Control Plan for each earthworks season will also be submitted and will be specific to the works to be undertaken in that campaign and will include, amongst others;

- (a) A plan showing the location and extent of the earthworks to be undertaken
- (b) The timing and duration of the earthworks
- (c) Areas of vegetation to be removed
- (d) Detailed sediment and erosion control measures to be employed for that earthworks season
- (e) Details and dimensions of sediment retention ponding areas
- (f) Detail and timing of rehabilitation of earthworks at the completion of the earthworks season
- (g) Confirmation that the works will be undertaken in accordance with the conditions of consent

7.3 Each Erosion and Sediment Control Plan will be based on:

- (a) Best practice experience from GBC Winstone sites
- (b) GD05: Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region
- (c) Procedures to ensure effects are contained on site and appropriately managed
- (d) An adaptive management approach
- (e) Previous monitoring and inspection of works and discharges

## 8. MATTERS RAISED BY SUBMITTERS

- 8.1 There were a number of matter's raised by submitters that I wish to comment on.

### **Otaika Quarry 2005 Mineral Extraction Management Plan – identifying in pit disposal from 2020**

- 8.2 A submitter (G Barton and M Barton-Boots) has submitted that the 2005 MEMP indicated that overburden could be placed back in the pit between 2020 and 2025.
- 8.3 In terms of in-pit disposal at Otaika, I acknowledge that the Mineral Extraction Management Plan (2005) Part 6.5.1.1, does identify that 'future long term overburden disposal areas will be within Pit, once the pit has reached final depth.' Part 6.5.1.2 of that plan identifies alternative overburden sites, states:

“In order to place overburden into the existing Otaika pit, that part of the pit would need to be at its final proposed depth. The current pit is nowhere near completion and final profile of the eastern pit wall in particular is not expected to be reached for the next fifteen to twenty years. The floor of the Otaika pit is currently about 60 metres above the proposed final floor level of the pit. The pit has been estimated to contain more than sixty years of aggregate resource at present production levels. In order to prevent this significant resource being compromised by placement overburden over areas yet to be extracted, this option clearly could not be considered.”

- 8.4 The reference in the submission to being able to backfill the pit commencing from 2020 to 2025 was not only dependant on completing the final profile of the eastern pit wall but also that the pit in that area would need to be at its final proposed depth. This is to confirm that the final profile of the eastern pit wall has not been completed and the pit floor in this area is not at its final depth.
- 8.5 One of the reasons why the eastern pit wall has not been completed is that it is overlain be overburden, which, despite several attempts to dispose of this material off-site, only limited volumes have so far been removed. It is difficult to place this material into the existing OBDA as it is located on the opposite side of the quarry (difficulties in providing safe access through the working area to the OBDA).

### **Haul roads – operation of haul roads**

- 8.6 Two submitters have made reference to the operation of the haul road to the OBDA (R Taylor, G Barton and M Barton-Boots). R Taylor was concerned that the deterioration of the roads the trucks travel on (due to trucks hauling massive loads) will vary the noise level, and Graham Barton and Mia Barton-Boots were concerned that dust be generated from trucks traveling on a 20 metre wide gravel road would be unable to be contained, particularly during strong south-westerly winds.
- 8.7 Section 3.5.3 of the Application describes the construction and operation of the haul road, in particular that the surface will be inspected regularly and maintained to minimise the potential of nuisance dust with the roads having a hard compacted surface. The regular inspection and maintenance of the roads will avoid the deterioration of the road surface.

### **Effects on groundwater seepages and hydrology**

- 8.8 Several submitters have raised concerns regarding groundwater seepages and groundwater hydrology (including C Johnston, C Thomas, R Taylor, B C Povey and S R McQuade, Acacia Park Landowners Assn Inc, A C Norman and F C Spencer, G Barton and M Barton-Boots, T Munro, Otaika Marae Komiti).
- 8.9 Effects of the proposed works on groundwater seepage and hydrology have been addressed in the application for Regional Consents (Otaika Quarry – Proposed Overburden Disposal Area Groundwater Assessment Tonkin and Taylor February 2017). I support the view in the S42A report to the Hearing Commissioners that these matters are Northland Regional Council matters outside the scope of matters to be heard at the hearing.

### **Effects on Limestone Caves**

- 8.10 Several submitters have raised concerns regarding the presence of limestone caves adjacent to, and underlying the proposed works (including C Johnston, L Connew and S Lemon-Connew, J Lowe-Arrol and C Arrol, A C Norman and F C Spencer, G Barton and M Barton-Boots, T Munro, Otaika Marae Komiti).

- 8.11 Extensive site investigations undertaken by Tonkin and Taylor and ScanTec on behalf of GBC Winstone's have shown that limestone hosting the cave system is absent below the footprint of the works. This is further discussed in the evidence of Mr Lines. An outcrop of limestone, with an associated small surface depression, is located along the north-western boundary of the site, as are limestone features further to the west in an adjacent property, however testing that has been completed has found that the caves do not extend into the overburden disposal area.
- 8.12 Te Henearu Trust were concerned about the possible presence of caves underneath the Pegram Block and engaged Dr Martin Brooks of Auckland University to peer review the application. Dr Brook has accepted the work of Tonkin and Taylor and concluded that "the T&T work is accepted as providing a reasonable summary of the geology and geomorphology of the Pegram Block site". These findings appear to have been accepted by the authors of Council cultural assessment and Officers Report.
- 8.13 The design of the overburden disposal area is such that it will be separated from this limestone outcrop and associated depression (tomo). Overburden is not proposed to be placed in the catchment leading to the surface depression (tomo).
- 8.14 To provide an additional reassurance to Te Henearu Trust who were concerned that sediment laden storm water could enter the adjacent cave system via this tomo catchment, and while GBC Winstone was confident this could be avoided using Sediment and Erosion Controls, it has opted to revise the footprint to ensure that this catchment is entirely avoided (Addendum 2 to AEE, Appendix 4 – Concept Plans of Proposal).
- 8.15 Following all the work the Company has done it is confident that the adjacent cave network and associated groundwater hydrogeology will be unaffected by the proposal.

#### **Alternative Uses for Overburden**

- 8.16 Three submitters (Taipari Munro, AC Norman and FC Spencer, and G Barton and M Barton-Boots) have submitted that other alternatives for the disposal of overburden have not been fully investigated by Winstones.

- 8.17 Alternative uses for overburden, including disposal at sites further afield from Otaika Quarry has been provided to Council (Addendum 2 to AEE, Overview of Other Options for Disposal of Overburden at Otaika Quarry dated March 2018). Alternative uses of overburden is covered in the evidence of Chris Edmonds.

## **9. SECTION 42A REPORT TO THE HEARING COMMISSIONERS**

- 9.1 I have read the Section 42A report to the Hearing Commissioners and wish to comment as follows:

### **Backfilling Quarry Areas**

- 9.2 S42A Report Para 8.25 – refers to paragraph's 2.23 and 5.3 in Michael Farrow's evidence with regard to possible alternative backfill areas of the quarry pit where aggregate has been fully extracted or where the resource has been fully exhausted in practical terms.

- 9.3 I confirm that this is not possible. The quarry pit floor is still being actively worked, aggregate has not been fully extracted and the resource has not been exhausted. As detailed above, placing overburden within the quarry pit will sterilise resource. It is very unlikely that backfilling of the quarry pit would be able to commence within the timeframe of the consents being sought without sterilising resource.

### **Completion of all Works within 55 dBA**

- 9.4 S42A Report Para 8.27 to 8.29 – the reference to Peter Runcie's report of a MEA noise limit rule to all the works including the enabling works.

- 9.5 This is to confirm that there will be construction works such as land clearance, stream diversion, foundation preparation including the excavation and placement of a shear key, construction of a retaining bund, drainage installation and site rehabilitation works within the enabling work phase of the development.

- 9.6 Noise modelling undertaken by Marshall Day has shown that these works will generally require a construction noise standard to be compliance at the notional boundary of residential dwellings adjacent to the works.

- 9.7 Alternative methods of working using smaller plant to place material in the retaining bund and in the drainage works within the Enabling Works development phase have been considered and various scenarios modelled using smaller equipment to complete these works, varying models of bulldozers, and restricting number of vehicles in a work area at any one time. Although some very minor reduction in noise emissions could be achieved, the works would not comply with the MEA noise limit, the construction noise limit would still be necessary. This would also impact greatly on the duration of the works.
- 9.8 It is estimated using the smaller equipment only for the enabling works would increase the length of these works from 2 to 4 times the duration as outlined in the proposal. Instead of two earthworks seasons (3-5 years apart of 6-8 months duration), this scenario is likely to result in either an extended first season of earthworks (subject to weather conditions), or the enabling works being undertaken over a number of consecutive years (to maintain rock availability within the quarry pit). This would result in similar amenity effects on residents for a longer duration.
- 9.9 This is further discussed in the evidence of Siiri Wilkening.

#### **RPS - Sterilisation of the Resource**

- 9.10 At S42A Report Para 9.6 – the Officer application of the RPS in terms of whether placing overburden in the Pegram block sterilises land with significant mineral resource, is incorrect. The Officer concludes that while Otaika Quarry is defined as a regionally significant mineral resource, the Pegram block is not identified as containing a mineral resource. This is overly simplistic and fails to appreciate the direct link between the need for overburden disposal area and sterilisation of the resource at Otaika Quarry.
- 9.11 The operation of a quarry includes not only the extraction, processing, stockpiling and sale of aggregate products, it also includes, amongst others (i.e. roading and haulways, water storage and treatment, storm water controls, offices, workshops and staff facilities), the removal and deposition of overlying materials (overburden).
- 9.12 The application is for the Pegram block to be used as a depository for overburden material from excavations undertaken within the quarry pit at Otaika Quarry. If this material is not removed and placed outside the

quarry pit, mineral resources within the quarry pit will be sterilised. There is no capacity adjacent to the quarry pit to contain any more overburden and placing material within the quarry pit at this stage in the development will sterilise resource.

- 9.13 So while the Pegram block does not contain a mineral resource, it is important as the use of the site as an overburden disposal area avoids sterilising mineral resource at Otaika Quarry.

### **Enabling Works – Noise Limits**

- 9.14 S42A Report Para 9.32 – regarding a suitable limitation on the noise levels associated with both the enabling and general works will ensure that the noise generated by the operation of machinery on the site will be appropriate and acceptable within the receiving environment.

- 9.15 Enabling works are needed to support the general works. They are the preparatory works that need to be undertaken in advance of the general works. The placement of overburden cannot start until the enabling works are substantially completed. The company worked closely with Marshall Day and others to develop the overall design for the overburden disposal on the site. The design process included close consideration of the permitted noise limits in the district plan. The district plan noise limits require the enabling works to meet the construction noise limits. The design developed meets these limits, except at two locations, where the written approval of the affected parties has been obtained. Requiring the enabling works to meet a noise standard that is even less than the district plan noise limit has been considered, as part of reviewing the Officers report, however is not considered practicable.

### **Staging the proposal**

- 9.16 S42A Report Para 10.5 – Consideration of alternatives to a 35 year term to place overburden on the Pegram block

- 9.17 The officer has suggested that instead of seeking a 35- year consent, that a staged consent approach should be considered, and new consents be sought incrementally for each stage of the design. This is not a practicable approach. The overburden placement is a comprehensive design that has been developed for the required volume of overburden. The form of the final completed and stabilised overburden area is critical

to informing the design of the initial preparatory and foundation works (the enabling works) at the commencement of the project. The 35-year consent was applied for to give certainty that the entire required overburden disposal area will be available for use.

### **Options**

- 9.18 S42A Report Para 11.7 – the Officer comments that an alternative option that minimises or avoids adverse effects on the cultural values be considered, and while the current proposal is likely to be the best option available for GBC Winstone, it may not be the only viable option.
- 9.19 The current proposal has incorporated operational, engineering, environmental and cultural considerations. With regard to cultural considerations, the Company has already modified the design of the proposed works. The footprint has been setback from the limestone landscape to the west of the Pegram block and the footprint has been adjusted out of the catchment area of a limestone outcrop on the property boundary.

### **S42A Report – Proposed Conditions of Consent**

- 9.20 In the event that the Panel was inclined to grant consent, the Officer has provided a draft set of conditions. While GBC is generally supportive of the conditions suggested by the Officer, I have the following comments to make.
- 9.21 **Condition 10** – requirement for a suitability qualified and experience Chartered Professional Engineer to verify that all works inclusive of the construction of the shear key and toe buttress and placement of matressed material have been generally completed in accordance with the document entitled ‘Otaika Quarry – Pegram Block Overburden Disposal: Assessment of Adverse Effects of Land Stability’.
- 9.22 A suitability qualified and experienced person may be more appropriate rather than a Chartered Professional Engineer. A Chartered Professional Engineer was not involved in the Tonkin and Taylor report and is not required to verify that the work has been undertaken in accordance with this report. Delete ‘Chartered Profession Engineer’ and replace with ‘person’.

- 9.23 **Condition 13 b)** - requirement for a suitability qualified and experience Chartered Professional Engineer to verify that the placement of overburden has been undertaken in accordance with sound engineering practice, and in general accordance with the document entitled 'Otaika Quarry – Pegram Block Overburden Disposal: Assessment of Adverse Effects of Land Stability'.
- 9.24 A suitability qualified and experienced person may be more appropriate rather than a Chartered Professional Engineer. A Chartered Professional Engineer was not involved in the Tonkin and Taylor report and is not required to verify that the work has been undertaken in accordance with this report. Delete 'Chartered Profession Engineer' and replace with 'person'.
- 9.25 In addition, the works need to be undertaken in accordance with sound engineering practice 'associated with the placement of overburden'. This will avoid uncertainty as to what 'engineering practice' is required to be undertaken.

## **10. SUMMARY AND CONCLUSIONS**

- 10.1 The proposal to place overburden in the Pegram Block has been carefully designed and planned. It has included geological, geotechnical, and hydrological investigations as well as operational and environmental considerations.
- 10.2 The staged design with the progressive development of final slopes enables progressive rehabilitation to be undertaken and the area to be returned to pasture in the shortest time possible.

**MIKE HARRIS**  
**March 2018**