Group ID: 422

Consent name: Fulton Hogan - Roydon Quarry

Consent number: CRC192408, CRC192409, CRC192410, CRC192411, CRC192412, CRC192413, CRC192414, RC185627

Name: Nigel and Alex McGrath

Care of:

Contact by email: Yes

Is a trade competitor: No

Directly affected: No

Consent support/hearing details

- CRC192408: oppose | WANT to be heard | WILL consider a joint hearing
- CRC192409: oppose | WANT to be heard | WILL consider a joint hearing
- CRC192410: oppose | WANT to be heard | WILL consider a joint hearing
- CRC192411: oppose | WANT to be heard | WILL consider a joint hearing
- CRC192412: oppose | WANT to be heard | WILL consider a joint hearing
- CRC192413: oppose | WANT to be heard | WILL consider a joint hearing
- CRC192414: oppose | WANT to be heard | WILL consider a joint hearing
- RC185627: oppose | WANT to be heard | WILL consider a joint hearing
Reasons comment:
Significant detrimental effect to our business neighboring the proposed site and concern for the well being of the surrounding community and environment in many regards. Please note our attached submission which provides significantly expanded detail.

Consent comment:
We wish the consent to be declined.
Attachment for CON520 – Submission – Fulton Hogan Quarry Application

Nigel and Alex McGrath
494 and 502 Maddisons Road
RD 5
Weedons
Christchurch 7675

Re: Applications to Environment Canterbury and Selwyn District Council for Resource Consent to use land situated on Jones, Curraghs and Dawsons Roads by Fulton Hogan Ltd

Resource Consent Application Points

2. The reason for making our submission is:

The address of 502 Maddisons Road is our residence where we live with our two young children and at the adjacent two titles addressed 494 Maddisons Road we have operated a large and successful harness racing business for over twenty years. This business is our primary source of income and the only purpose for which we own a total of fifty acres across three titles, all of which are bounded by Maddisons Road and are located across three titles within a five-seventy hundred metre distance of the proposed quarry.

Nigel and I firmly oppose the proposed quarry for two key, over-arching reasons.

1. The proximity of the quarry to our business and the resulting detriment it will have is unacceptable.

Nigel is a professional horse trainer of fifty plus horses.
The health and well-being of our approximately six full-time staff who work outdoors every day will be compromised in regards silica dust exposure.
Lower airway disease is a debilitating condition for racehorses that is commonly caused by silica dust exposure. Real or even perceived exposure of our horses to silica dust will be debilitating for our business in terms of the results we will no longer be able to produce on the track and the reputational damage that will be caused.
Noise and ground vibration pollution is unsettling for horses - if unsettled they cannot perform. There will be no way to assure our clients that their horse is not disadvantaged in being located with us, next door to the proposed quarry.

The presence of a quarry would likely force us to shut the gates, lay off staff and dispose of our fifty acres for an extremely reduced value given the loss of all capital value currently invested throughout the property, in order to house, train and care for horses.

Air, water and noise environmental quality are vital components in our business that our location, given the district plan and detailed zoning guidelines, should guarantee.
A low-stress (i.e. low noise and lack of ground vibration) and dust-free environment is integral to the welfare of the horses we are entrusted to care for and train to the best of their ability. Our staff, and we (in working outdoors, seven days a week) have the right to clean air and a relaxed environment whereby our safety is not jeopardised by horses unsettled due to heavy traffic and quarrying noise, or ground vibrations.
We have the right to not see our business decline due to the reputational and real issues that will be created by the air, water and noise pollution that will be inflicted on our property. All these forms of pollution will have a detrimental effect on the equine athletes that we are entrusted to care for in the best possible manner.

We have the right to not be forced to relocate in order to continue to operate to the standard of business which we currently conduct. Due to capital setup costs, re-location is NOT an option we could reasonably consider. Detriment caused by the proposed quarry would not be repairable. As previously mentioned we would likely need to dispose of the property. Nigel has trained horses his whole life and so a change in career is an outcome that would see our family significantly financially disadvantaged.

2. For our children, and the vulnerable community members of Templeton.

The traffic, noise, air and water pollution this quarry would create promotes an unsafe environment for our children to grow up in, one that is far removed from the future we envisioned when soundly instigating roots here over twenty years ago.

We are disgusted that a large, privately-owned New Zealand entity considers it acceptable to put the physical and mental health of a three-thousand strong community of people at risk.

In summary, we **strongly object** to the proposed quarry being positioned on the corner of Dawsons, Jones and Curraghs Roads.

Below we provide further detail on the reasons that we oppose the quarry, by subject area.

**DUST**

Besides the concern for the entire community of Templeton, our personal concern is for our horses, our children and ourselves. The dust generated from the process of mining the shingle has particles that affect the airways of all living creatures, both human and animal and our horses will encounter this daily – particularly during daily training which will detriment their fitness progress and their health.

We have been advised by a veterinarian that the dust particles are particularly dangerous, and he has provided scientific evidence from Canada and USA showing the effects on horses. This can be found in Appendix B.

Our proximity to the site means our horses will absolutely be in contact with these dust particles.

It is timely that the point be clearly re-iterated that re-location is NOT an option for our business.

We note from the submission that initially an extraction area is to be developed in the centre of the property and soil is to be stockpiled. This will very easily become a dust bowl as there will be no way to contain the large piles of dirt from any wind - therefore easily creating dust to become airborne. Also, the submission talks about stock piling - how much will be held on site at any one time and how close to boundaries will this take place? Dust will be generated by any stock pile on the site.

Our children are four and nearly two years old. Our eldest son has asthmatic and skin-inflammation/eczema issues. It is not acceptable that a commercial operation should put his quality of health at risk when he spends time in the beloved outdoors.
For our workforce (of approximately six full-time employees, varying across the year) and ourselves, it is not acceptable that we are expected to tolerate prolonged and continual exposure to respirable crystalline silica, due to the nature of our working outdoors for long periods of each day – at all times of the year.

It is also not acceptable that we are expected to tolerate the severe nuisance and health risks associated with dust embedment on our clothes when hung outside to dry. Our asthmatic son particularly.

The growth of quality grass for our horses and of fruit and vegetables on our good productive soil will be comprised by the persistent presence of dust. Plants require light to generate photosynthesis, but if they are covered in dust this will inhibit growth and hence our productivity.

Fulton Hogan will argue that they will contain the dust, but evidence to the contrary is plentiful in relation to the numerous, prolonged and very real dust-related concerns strongly voiced by residents of Yaldhurst. The Yaldhurst sites have been earmarked for quarry use and there is little if no housing in the surrounding area, unlike this proposed site where there is high density housing and lifestyle blocks close by. This site is not zoned for quarry use.

Air quality influences several areas of our society for instance health – those who suffer from respiratory conditions such as asthma, bronchitis, pneumonia, and emphysema to name just a few will unfairly suffer from dust created by this quarry site. This is disgusting and unacceptable.

**NOISE AND GROUND VIBRATION**

Aside from the obvious concern regarding noise pollution of what is supposed to be a peaceful area (besides air-traffic) being zoned as Inner Plains – we are concerned specifically for vibratory and auditory noise pollution for our children during weekends, mornings and evenings specifically with proposed operation hours stretching into these parts of the day and week. Secondly, we are concerned as to the stress the vibratory pollution from the operation of heavy equipment, will cause our horses.

It is well known that horses have a higher and more specific auditory function than humans, they also sense the world around them through their hooves.

“The horse's foot is the primary avenue for the horse to obtain information about the physical features of the ground surface upon which it stands and moves. The horse gains access to this information via the nerves and receptors, which are specialized for sensing specific information that is detected by the foot. This information is then transformed into electrical activity which is conveyed along nerves in the horse's legs to the central nervous system (CNS), including the spinal cord and brain. Within the spinal cord, the generated nerve activity becomes incorporated into the different reflexes needed for movement, postural.” - Bowker, Robert & Isbell, Diane & Lancaster, Lisa & Leonhardt, Wayne. (2012). The Horse's foot as a Neurosensory Organ: How the Horse Perceives its Environment.

We are concerned as to the high-level of alertness and hence sensitivity that ground vibrations, given our extremely close proximity to the proposed quarry, will cause our horses. Horses – much like humans – that are over-stimulated and stressed, do not perform.

Equally, ongoing and sporadic vibratory impacts via their hooves will impact on the health of their muscular and skeletal systems. There is significant literature to support this. “The equine limb has evolved for efficient locomotion and high-speed performance. It can be considered mechanically
constrained, lacking the ability seen in other legged animals to adapt dynamically to different circumstances” – R.S.V. Parkes, T.H. Witte. (2015), The foot-surface interaction and its impact on musculoskeletal adaptation and injury risk in the horse.

In the proposed submission it talks about a fog cannon - what noise and vibratory levels does this generate and what hours will it be operating on site?

There is no assurance that initially anticipated noise and vibratory output levels won’t increase given intentions to increase production from the quarry. The anticipated noise and vibratory ground pollution that we would directly, perpetually and consistently experience is grossly unfair and unacceptable.

IRRESPONSIBLE COMMUNITY AND ECOSYSTEM MORALE
This week our government released a world-first ‘wellbeing’ budget which cites numerous indicators in relation to environmental and community wellbeing. Any business, especially one that is both one of the country’s biggest employers and one of the crown’s biggest suppliers must be held to account in operating in a manner consistent with the values held by central government.

Ecosystems are the responsibility of those individuals who make changes in the environment. It is these people that should be looking to sustainability to ensure we have a balanced environment in which we live and work daily. Fulton Hogan are ignorant of this notion by jeopardising the environment here in Weedons and Templeton by considering a site totally unsuited to quarrying. Sustainable development is the type of development that meets the needs of the present without compromising the ability of the future generations to meet their own needs. Fulton Hogan are looking to their own gains and not that of the future generations by placing a quarry in a residential / lifestyle area only 20 kilometres from the city centre. How can this be looking after future generations?

Healthy ecosystems and environments are necessary for all humans to survive in the future. A quarry of this size will have detrimental effects on the local ecosystems. For instance, those people who have beehives in the area will be impacted and in turn the crops will not be pollinated. Crops will be affected by the increased dust created in the area and this in turn will impact on individual’s ability to secure income from their properties.

DISREGARD FOR TECHNOLOGY OPPORTUNITIES
Fulton Hogan appears to be a prime example of green-washing at its best. On the one hand they are suggesting they are developing potential solutions for plastic waste and investigating future alternative roading surfaces (https://www.fultonhogan.com/trial-recycles-plastic-containers-asphalt/). They also have staff investigating disruptive technologies in relation to “Future Cities” https://www.ipwea.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=355a1ff1-058d-a844-c682-09b4036d3589 and yet they are investing significant resource into securing a VERY LARGE aggregate-producing quarry, very near a residential area, for the next FORTY YEARS. Clearly they have no intention to pursue diversification from aggregate extraction with any great vigour or commitment. The following is an excerpt from the above mentioned “Future Cities” report – we underline comments of irony:

“The concept of the city of the future features a harmonious environment where electric vehicles reduce emissions, pedestrians and cyclists can move about the city safely without being at risk of being hit by transiting vehicles, and autonomous vehicles combined with a multi-modal connected
transport system provides opportunity for safe and easy transit for people of all ages, to all destinations. **New Zealand will need to embrace advancements in technology and electric vehicles to ensure a sustainable future, enabling economic strength as our population continues to grow.**” A company of this size, that is so heavily involved in providing services to the public sector, must be held accountable for providing innovation and thought-leadership in regards to improved provision of infrastructure now and into the future.

**TRAFFIC VOLUMES**

Initial plans suggest the proposed quarry will not see Maddisons Road subjected to additional DIRECT traffic, but by default indirect spill-over increases will definitely result. Our road has already proved ill-equipped for increased traffic – despite a recently reduced speed limit, our area is generally considered ‘open road’ by motorists – as it has been for many years. Wide grass-verges were not enough to recently protect an innocent pedestrian from the effects of infrastructure not suited to dense/commercial traffic. Many cyclists also use the local roads for pleasure. Larger traffic volumes on rural roads that weren’t designed for such volumes will be dangerous to ride on. Maddisons Road has a very narrow carriageway not allowing for a cyclist to ride single file without the fear of being knocked off. Our children will eventually attend Weedons School – within two kilometres from our house. They will never experience the positive mental, physical and emotional effects of riding a bike to school as it is simply far too dangerous. This is unfortunate given the central-government push for more use of environmentally friendly transportation. If commercial entities such as Fulton Hogan would plan to use and develop roading infrastructure in a responsible manner, these visions could be a reality for our community.

**ZONING**

Referencing the Selwyn District Plan we make mention of:

The smaller allotment size and higher population density of the Rural (Inner Plains) Zone means that rural based industrial activities of a size and scale beyond that which is permitted by the District Plan are unlikely to be able to locate in this area without generating significant adverse amenity effects.

**B3.4 – QUALITY OF THE ENVIRONMENT**

See Appendix A - District Plan with highlighted paragraphs

Inner Plains permits dwellings to be built plus additional small household units on sites (total of two units) of more than 10 acres. Therefore, neighbouring dwellings to the boundary of the quarry block are:

- 20 metres
- 120 metres
- 150 metres
- 100 metres
- Etc
**B1.3 – WATER ISSUES**

- Pollution of ground water and waterbodies
- Demand for water supplies can affect the quantity of water in waterbodies
- Discharge of contaminants into water or running off land can affect water quality
- Structures, earthworks and trees planted along the edge of waterbodies can affect the natural character of the waterbody and access to it

The above we noted from the District Plan and highlight the effects on water contamination and possible effects of access to water which may occur should the quarry proceed.

The concern of water supply in this area is highlighted by ECAN identifying the area as “Red” – high risk. To consider this quarry activity will surely not meet everybody’s concerns about aquifer water depletion or ECAN’s own rules identifying the area as one where no more high use bores / rights can be granted.

The amount of water required to run an operation like this will be detrimental to private wells in close proximity – we have several on our property which are the only source of water to our property for our own domestic use and for watering our horses. With approximately fifty horses on our property at any one time, water access risk is not acceptable and puts the welfare of our livestock at an immediate and serious ongoing risk.

**REAL SUPPLY AND DEMAND**

Often the excuse of extortionate demand created by infrastructural improvements required by the broader Canterbury region in response to both economic development and the Canterbury earthquakes, is used when referencing the ‘requirement’ of this proposed quarry.

We would like the question answered as to whether this demand is real in a ‘whole of supply’ sense (i.e. inclusive of Fulton Hogan’s competitors) or is this proposed quarry and the blatant economic advantages it will provide Fulton Hogan the company, due to proximity to roading projects, simply a competitive tool to be able to provide a large amount of aggregate at a cheaper price than their competitors?

We understand that the supply volume of aggregate to the broader Canterbury district is actually not an issue – the illusion of a shortage is simply created by the players in an illustrious and highly profitable industry, in their competing against each other in what is clearly a too open, and too unregulated market.

Perhaps when the next quarry application comes in from a Fulton Hogan competitor in an empty industrial site in Hornby for example, those able to take control of this situation might actually stand up and act against the blatant persistence of economic greed over all else being consistently displayed by the roading infrastructure industry.

**FULTON HOGAN PROPERTY OWNERSHIP – WHY NOT MINE THIS NOW?**

Below is a map showing a block Fulton Hogan recently purchased and adjacent to their already owned land in Yaldhurst. Given the zoning for these properties is already “quarry zone”, surely there
is no need to proceed in the Templeton / Weedons location. The residents of Yaldhurst have known this land has been designated / zoned quarrying for many years.

Below shows the “Rural Quarry Zone” for this Fulton Hogan land in Yaldhurst.

SURROUNDING DEVELOPMENT
Given the information about Fulton Hogan purchasing quarry zoned land before Dawsons Road we ask the question - is the subject block suitable? It is not zoned and the below map outlines the rural / lifestyle / residential area for the proposed quarry site.

There are three main areas of large holdings - the proposed quarry site made up of the Roydon Lodge property and the Ward family farm and the Christchurch City Council holding which was purchased many years ago for agricultural education purposes. The Christchurch City Council land has recently been talked about being used for future sports facilities and perhaps a cemetery (but that still has to be consented) and may require change of use and consultation with the original owners.
The only other large holding is the Prison combined property. Therefore, without exception the whole area is made up of farming and lifestyle blocks and an intensive area in Templeton and further out Rolleston and West Melton of residential housing.

Therefore, we again ask with the agricultural rural lifestyle use which dominates the surrounding area and the underlying “Inner Plains” zone surely this land is not suitable as a quarry.

Fulton Hogan’s recent purchase at West Coast Road provides sufficient area for the company’s immediate quarry needs.

We again question REAL demand for aggregate – versus a desire for Fulton Hogan to simply improve their financial competitiveness in this grossly unregulated and immoral market.

It is also noted from the Selwyn District Scheme the definition of “The Plains” as quoted below certainly does go against everything the application from Fulton and Hogan is seeking -

**The Plains**
The Canterbury Plains are the largest area of flat land in New Zealand. It is an outstanding natural feature. It is also an area with different characteristics, such
as the wetter area around Te Waihora/Lake Ellesmere with loam and clay soils, and the drier, stonier area on the Waimakariri river floodplain, west of Christchurch. The different characteristics of the Plains have resulted in different land uses and intensity of subdivision and settlement. These differences are reflected in the division of the Plains into Inner and Outer Plains for the management of subdivision and residential density in the Plan.

The single most significant resource management issue on the Plains is the demand for small allotments (less than 4 hectares) for residential development. The demand is greatest within an area up to 30km from Christchurch City. This demand affects:

- Natural resources such as groundwater and soil;
- Farming activities and potential ‘reverse sensitivity’ issues;
- The character of the rural area.

These issues are addressed in Part B, Sections: 1.1, 1.2, 3.4 and 4.1 of the Plan.

GENERAL
Lastly there are several other factors that should be included such as VISUAL POLUTION, this is from both land and air. As this site is on the controlled airport landing line it isn’t a very nice “welcome to Christchurch” – or “100% pure New Zealand” for that matter, out of the window for passengers in an aeroplane seeing a large hole in the ground so close to the city centre. Also, INVESTMENT, this will affect the whole district of Templeton, Weedons and surrounding areas. This will affect us as home and landowners when it comes to selling our properties, potential buyers will be less likely to purchase in this area with a “quarry” on the doorstep, thereby reducing the number of people interested in our properties. The overall effect on the ENVIRONMENT will be significant, it is a rural location close to city amenities, not a gravel pit. The water ways, wells and rivers will be affected by the drawing down of water to eliminate dust.

CONCLUSION
We have concerns about this application and these in part are –

- Does not meet the “Inner Plains” zone intent – large heavy industrial use was never envisaged to be in this zone and it is grossly unfair that a changed interpretation be inflicted on all who have invested in this otherwise lucrative area.

- Sensitivity comments in the Selwyn District Plan is the opposite to what the application is intending.

- Traffic

- Water Supply (ECAN “red zone”)

Page 9
- Noise and machinery vibratory pollution

- Visual Pollution

- How can an Independent commissioner decline a free-range egg layer poultry farm intended for the “Outer Plains” zone, but Fulton Hogan thinks a heavy industrial use application can be successful when it is located in the “Inner Plains”.

A free-range poultry farm was declined by the Selwyn District Council (Independent Commissioner) in the “Outer Plains” which permits dwelling construction on rural blocks greater than 50 acres. However, Fulton Hogan expect the community to allow a quarry in the “Inner Plains” zone to be accepted by the community and approved.

This application does not meet the “sensitivity” test that Selwyn District Council has specifically commented upon in the Rural zone rules.

3. We wish the consent authority to decline the application.
Appendix A

B3.4
QUALITY OF THE ENVIRONMENT — ISSUES

• Activities which affect the character of the rural area or which make it a less pleasant place to live or work in.

• “Reverse Sensitivity” from activities with incompatible affects locating too close to each other.

Introduction
This section deals with two issues:

• The effects of activities on the amenity values of the rural area – its character and quality of the environment.

• Reverse sensitivity effects – when a new activity sets up near an existing activity and complains about the effects of the existing activity.

Amenity Values/Rural Character
Protecting amenity values is part of achieving the purpose of the Act. Section 7 requires particular regard be had to:

• The maintenance and enhancement of amenity values’ (section 7(c)); and

• Maintenance and enhancement of the quality of the environment (section 7(f)).

Amenity values is defined in the Act (section 2) as including:
“Those natural or physical qualities and characteristics of an area that contribute to people’s appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes”.

The rural area has a character which is distinct from townships. There are common perceptions which many people share about the character of the rural area. These include:

• Predominance of vegetation cover.

• Dominant land uses (but not all land uses) are associated with primary production: agriculture, horticulture, forestry, pastoralism.

• Views of mountains, basins and river valleys which are not modified by structures.

• Being able to see, hear and smell animals and birds.

Rural character can also mean different things to different people.
• People who live in the rural area as an alternative to living in a town may value a sense of open space, panoramic views and their perception of a rural outlook.

• People carrying out farming and other business activities may share some of these values. They also perceive the rural area as a business area and expect to be able to carry out existing activities; adopt new technology and practices; and to diversify activities as markets change.

• Some people value the rural area as a place to locate activities that need lots of space. These people may value large areas of land and distance from neighbours.

Conflicts can be created by the combination of different activities, effects and perceptions of the character of the rural area.

In particular, issues are emerging in the District over effects of activities which are typical or normal for rural areas, but which some residents do not expect or dislike. These effects fall into two categories:

• Temporary effects from seasonal activities such as burning stubble, harvesting crops or topdressing.

• Effects from day to day activities in the rural area are part of the rural area which are different from effects in townships such as, the smell of crops like silage, turnips or garlic; or noise from irrigators or tractors; and stock being driven along roads.

The Council believes these effects are part of the character of the rural area. This District Plan has policies and rules to maintain a generally pleasant living and working environment. However, residents should not expect an environment which is as conducive to residential activities as Living zones. The Rural zone is principally a business area and the policies and rules are designed to allow people to undertake farming and other business activities relatively freely. In addition, the policies and rules acknowledge sites established for dairy processing activities and provides for the continued development of these sites in the Rural Outer Plains for the processing, testing, storage, handling and packaging and distribution of milk and dairy products, related by-products and ancillary activities.

Reverse Sensitivity
Reverse Sensitivity is jargon to describe the situation where a new activity locates close to an existing activity and the new activity is sensitive to effects from the existing activity. As a result, the new activity tries to restrict or stop the existing activity, to reduce the effects. Reverse sensitivity is one of the major resource management issues in the rural area. It occurs principally between residential activities and activities associated with primary production or rural industries.

Reverse sensitivity issues arise when:

• Subdivision of rural land and erecting houses occurs in the vicinity of established activities; or
• Houses and other activities are located side by side, and the effects of the other activity alter.

The nature of reverse sensitivity issues varies in the District. There are examples of quite significant issues which have involved considerable time and cost to all parties, including the Council. For example:

• Mushroom composting at Prebbleton.
• Dairy cow droving along Old Tai Tapu Road.
• Noise from audible bird scaring devices.
• Houses and restaurants close to intensive pig or poultry farms.
• Nightglow from houses erected close to the West Melton Observatory.

Reverse sensitivity is a matter to be addressed as part of promoting sustainable management of natural and physical resources. People and natural and physical resources are part of the definition of environment in section 2 of the Act. Potential adverse effects of new activities on existing activities must be avoided, remedied or mitigated under section 5(2)(c) of the Act, and part of promoting sustainable management is enabling people and communities to provide for their economic, social and cultural wellbeing (section 5(2)). Potential reverse sensitivity effects have been recognised by the Environment Court as an issue under the Act, in several cases. The District Plan has provisions to manage potential reverse sensitivity effects when the effects may be significant enough to create an unpleasant living or working environment. In these cases, reverse sensitivity effects may have significant costs on residents or businesses. The District Plan does not address effects which the Council considers are a typical or normal part of the rural environment, and which are mild or of short duration.

QUALITY OF THE ENVIRONMENT — STRATEGY
The Rural Volume of the District Plan uses the following basic strategy to address issues affecting environmental quality, rural character and reverse sensitivity:

Amenity Values

• The Plan identifies what rural character is and manages activities which may affect it.
• Temporary effects and mild effects which are typical of rural areas are part of the rural environment.
• Policies and rules manage effects of activities, which may be more severe or adverse.

Reverse Sensitivity
• Policies and rules manage the location of activities which may have significant effects on surrounding properties, when they set up.

• Once set up, policies and rules protect these activities from reverse sensitivity effects from other activities locating near them.

Objectives and policies in this section should be read in conjunction with the following:

• **Section B1.4 Outstanding Landscapes and Natural Features**
  - Effects of activities and landscapes and rural character.

• **Section B2.1 Transport**
  - Stock droving and airfields.

• **Section B4.1 Residential Density and Subdivision**
  - Managing residential density in the rural area.

**QUALITY OF THE ENVIRONMENT — OBJECTIVES**
Objective B3.4.1
The District’s rural area is a pleasant place to live and work in.
Objective B3.4.2
A variety of activities are provided for in the rural area, while maintaining rural character and avoiding reverse sensitivity effects.

Explanation and Reasons
The rural area has a character which is distinct from townships and people value this distinction – the rural outlook. The rural area of Selwyn District is a pleasant place to live and work in. **Objective B3.4.1** is to maintain this quality of the environment. It is achieved by policies and rules to manage effects such as noise, vibration, outdoor signage; glare and odour. The policies and rules allow for day to day farming and other activities which have effects typical of a rural area, but manage activities that have potentially stronger effects. The policies and rules are not as stringent as those for Living zones. The Rural zone is recognised principally as a business area rather than a residential area, in the Plan.

**Objective B3.4.2** recognises the Rural zone as an area where a variety of activities take place:

• All sorts of primary production

• Outdoor recreation

• A variety of business activities
• Residential activities; and community facilities.

This diversity may increase in the future if farming and other business activities continue to diversify; and District Plans do not require activities in the rural area to be associated with primary production.

A variety of activities in the rural area creates the potential for reverse sensitivity effects, particularly between residential activities and other activities. **Objective B3.4.2** recognises that while a variety of activities may be appropriate in the rural area, **rural character must be maintained**; and potential reverse sensitivity effects must be avoided. **Objective B3.4.2** is achieved by policies and rules which:

• Describe the **character of the rural area and seek to maintain it**.

• Require resource consents for activities to set up which may affect surrounding properties; and recognise and protect existing lawful activities from potential reverse sensitivity effects once they are set up.

The Council has chosen to use District Plan rules to manage effects of activities on amenity values and reverse sensitivity effects. Often people do not consider the effects of existing activities when making decisions about where to build houses in the rural area.

The policies are split into 3 groups:

• Those to identify and maintain rural character.

• Those to maintain the quality of the environment.

• Those to manage reverse sensitivity effects.

Policies and rules to manage reverse sensitivity effects are also found in **Section B2.1 Transport**, for airfields and airports. Policies and rules to manage residential density are found in **Section B4.1 Residential Density and Subdivision**.

**QUALITY OF THE ENVIRONMENT — POLICIES AND METHODS**

**RURAL CHARACTER**

Policy B3.4.1

Recognise the Rural zone as an area where a variety of activities occur and maintain environmental standards that allows for primary production and other business activities to operate.

**Explanation and Reasons**

**Policy B3.4.1** recognises that the Rural zone is principally a business area. Farms, forests, ski areas and other rural activities are businesses and they need to be able to operate efficiently and with as few restrictions as practical. Residential activities occur in the Rural zone, both ancillary to farming and other business activities, and as the principal use of the site. The Plan provisions, coupled with the distance between houses and activities in the Rural zone, should combine to maintain a pleasant living environment. However, the rules will not be as stringent as those in Living zones and residents can expect to tolerate
mild effects associated with ‘day-to-day’ farming activities and temporary effects associated with seasonal activities.

Method
District Plan Rules

• Rules manage effects not types of activities, except in Policy B3.4.2

Policy B3.4.3
Avoid, remedy or mitigate significant adverse effects of activities on the amenity values of the rural area.

Explanation and Reasons
There are many places in the rural area which are not outstanding landscapes or natural features or which do not contain significant ecological sites but which people find pleasant places to live in or visit, for example, rolling hills, meandering streams, and fields with animals and crops, which are all typical rural scenes. These areas can be sought after locations for activities that need large sites and to be separated from people. Some of these activities can make areas less pleasant – they can affect their amenity values. Policy B3.4.3 requires adverse effects from activities on the amenity values of rural areas generally be mitigated. Part of promoting sustainable management under the Act is having particular regard for:
"The maintenance and enhancement of amenity values." (section 7(c)).
Policy B3.4.3 should not be used as a catch-all policy to oppose any changes to land uses in an area. Changes in land uses do not necessarily detract from the amenity values of an area and may enhance them. Where an activity will detract from the amenity values of an area, Policy B3.4.3 requires those effects be mitigated.
The requirement to mitigate adverse effects of activities in Policy B3.4.3 of this section does not replace more specific duties to protect areas and avoid adverse effects, in other policies in the Plan.

Method
District Plan Rules

• Discretionary activities

• Dairy Processing Management Area

Policy B3.4.4
Ensure that any adverse effects arising from “rural based” industrial activities in the Rural (Inner Plains) Zone of a size and scale beyond what is permitted by the District Plan and “other” types of industrial activities in all Rural zones are avoided, remedied or mitigated to the extent that the adverse effects are no more than minor.

Explanation and Reasons
While the Rural zone may be able to better accommodate the potential adverse effects associated with industrial activities than Living or Business 1 Zones due to a lower population density and larger allotment sizes, certain types and scales of industrial activities are unlikely to be appropriate in all parts of the Rural zone. For the purposes of the Rural Volume, industrial activities have therefore been categorised into either a “rural-
based” or an “other” type of industrial activity. Rural-based industrial activities are those that involve a raw material or product that is derived directly from the rural area (e.g. timber yard, winery or dairy factory), as opposed to other types of industrial activities (e.g. panel beating, dry cleaning or spray painting).

The effects associated with permitted small scale rural-based industrial activities are appropriate in all rural areas. Where these activities are of a scale and size beyond what is permitted by the District Plan there is a potential for their effects to impact on aspects of the rural environment such as visual amenity, rural outlook, spaciousness and quietness. There is also likely to be a higher demand for servicing requirements, such as water supply and stormwater disposal, which may be constrained in some parts of the rural area. Overall, the Council recognises that it may be necessary for an industrial activity that relies on a raw material or primary product derived from the rural environment to locate in proximity to its source.

However, the potential adverse effects of rural-based industrial activities that are of a size and scale beyond that which is permitted by the District Plan may be avoided by locating in a Business 2 Zone or in the Rural (Outer Plains) Zone where larger allotment sizes and lower population densities provide greater opportunity for internalising adverse effects.

Provision is also made for Dairy Processing Management Areas. This is an overlay within the Rural Outer Plains that is limited to sites of existing and established dairy processing facilities. Dairy processing facilities can be anticipated within, and form part of a cohesive rural character in the Rural Outer Plains and the Management Area limits activities to those associated with a dairy processing plant and manages the scale of development through the use of an Outline Development Plan (ODP) and a specific set of rules. Accordingly, the DPMA enables economic efficiency to be achieved whilst ensuring the integrated management of effects at the boundary with the rural area, avoiding effects on the rural character and amenity values of the Outer Plains. The smaller allotment size and higher population density of the Rural (Inner Plains) Zone means that rural based industrial activities of a size and scale beyond that which is permitted by the District Plan are unlikely to be able to locate in this area without generating significant adverse amenity effects.

The effects associated with other types of industrial activities (i.e. those that are not defined as “rural-based” industrial activities) are considered to be generally inappropriate in all parts of the Rural Zone, except for industrial activities involving the use or extraction of natural resources in the Port Hills, Malvern Hills or High Country. While there is a degree of acceptance for rural-based industrial activities within parts of the rural area, other types of industry are likely to detract from the quality of the rural environment resulting in significant adverse visual effects, increased traffic generation and noise, and a reduction in rural outlook and openness. As such, it is appropriate that these types of industrial activities are directed to locate within Business 2 Zones, unless significant adverse effects can be avoided, remedied or mitigated.
Silicosis in Horses

In the scenic foothills of the Central coast of California, there lurks a quiet problem that can lead to severe disease in our horses. Commonly known as ‘chalk rock’, this dusty rock form can cause an irreversible lung condition known as silicosis.

Silicosis is a well known occupational disease in humans, typically caused by inhaling rock dust created in mining, masonry work, sandblasting, and many other industries where rock is crushed into an easily-inhaled dust.

In horses, the disease was first diagnosed in the late 1970s in the Monterey-Carmel area. Before this time, area veterinarians had noted signs of respiratory disease, but had been unsure of its cause. For years, silicosis in horses was believed to be isolated to this small region. But as awareness of the disease increased, cases started to be diagnosed in other parts of the state.

What causes silicosis?

Briefly, silicosis is caused by inhaling silica dust small enough to travel all the way into the smallest airways and air sacs in the lung. Some sources incompletely describe silicosis as a lung disease caused by inhaling quartz dust. As will be discussed in the section titled Silicates, other crystal forms of silica can also cause silicosis. Once the dust particles become lodged in the lung, the body mounts a strong immune reaction. While bacteria or pollen can be broken down and removed from the lung, silicates can not. This causes an ongoing process which can lead to scarring of the lung, and, in people, certain auto-immune disorders.

History

In humans, silicosis is a fairly well understood but frustrating disease. Even now, there is no cure. Occupational safety measures have dramatically decreased the incidence of the disease, but cases still occur.

The most notorious occupational incident occurred in the early 1930s when at least 700 workers died from silicosis. Workers came from all around to tunnel through a mountain in Gauley Bridge West Virginia, eager for any type of work during the Great Depression. The tunnel was to be used to carry water for a new hydroelectric plant. Although it was well understood at the time that silicosis was a risk if dry-drilling was used, the contractors chose this method over the much safer, but slower, wet-drilling technique.

As an occupational disease, silicosis may have been recognized by ancient Egyptians, and was described well by Agricola in 1556.
Silicates

Silicates are crystalline forms of the element silica. By far the most widespread crystal of silicate is quartz, which is present in most rock types. The form which causes silicosis in horses is cristobalite. Cristobalite causes a more severe reaction in the lung than quartz does. This crystal is present in abundance in the Monterey/Carmel Valley areas. Geologists refer to this particular deposit of rock as the Monterey Formation. Although this rock type is common in this region, it is present from Point Reyes to San Onofre in the coastal ranges, with outcroppings in the San Joaquin valley, and as far south as Baja California.

The Monterey Formation developed in shallow seabeds during the Miocene epoch (between 5 and 20 million years ago) from deposits of microorganisms known as diatoms. Diatoms have a non-crystalline form of silica in their structure which, over millions of years, becomes compressed into crystalline forms. Initially, the crystal formed is cristobalite, but with more time, quartz can be formed. Many of the soils of the Monterey Formation have high levels of cristobalite.

These soils are often referred to as ‘chalk rock’ locally, as they tend to be dusty and light. (True chalk is actually limestone, which contains no silica.) Geologists refer to some of the various subsets of the Monterey Formation as porcelanite, chert, siliceous mudstone, and siliceous shale. For the rest of this article, the term silaceous soils will be used.

Cristobalite can also be formed through volcanic activity. The Sonoma volcanic soils are a likely source of the cristobalite responsible for silicosis in horses from this region.

Roadcut exposing siliceous shale of the Monterey Formation.
Exposure
Areas with siliceous soils are typically in foothill areas. Often, cases are seen not long after recent construction has disrupted the soil, creating a dusty environment. The horses inhale the dust over days to months or even years. Depending on a variety of factors, affected horses may show no signs or could develop severe respiratory compromise. Rate of exposure and individual immune response probably play the biggest roles in terms of severity of signs.

Clinical Signs
Affected horses will sometimes develop a cough, an elevated respiratory rate (normal resting rate for a horse is typically around 8-16 breaths per minute), flared nostrils at rest, and/or exercise intolerance. It is very important to remember that these signs are typical of respiratory compromise in general, so are not specific for silicosis.

Diagnostics
Lung x-rays are the simplest test to perform to diagnose silicosis. Abnormal x-rays exhibit classical signs for silicosis in advanced cases. Early or mild cases may have subtle, non-specific lung x-ray findings.
Samples of fluid and cells from the lungs can be obtained in two ways: a trans-tracheal wash, or a bronchoalveolar lavage (BAL). Affected horses may exhibit pink crystals within a type of white blood cell called a macrophage. The crystals are silicate crystals, and the macrophages are the cells that attempt to destroy or remove the particles. At Steinbeck Country Equine Clinic, we typically choose the BAL technique for this diagnosis.

Ultrasound is occasionally useful in imaging silicosis cases, particularly with advanced cases. Most silicosis changes are deep within the lung, and the ultrasound beam does not penetrate through the air present within the lung, so less advanced cases do not show up well.

**Treatment**

In horses, as in humans, there is no cure for silicosis. Treatment involves removing the horse from the silicate dust as well as from other types of dusty or moldy environments. In mild to moderate cases, short courses of steroids and bronchodilators can get a horse through a flare-up. Affected horses may not be able to regulate their temperature, so it is important during hot weather to provide shade, or other means to create a cool environment.

**Silicate Associated Osteoporosis**

In horses living on siliceous soils, certain bone deformities and fractures can develop. Horses with silicate associated osteoporosis can develop signs years after moving away from an area with siliceous soils. This disease typically occurs in horses with a longer-term exposure to silicate dust. The bones develop osteoporosis which, as in people, can predispose to fractures. Horses typically develop bowed shoulders, a swayed back, and often a stiff neck secondary to osteoporosis and secondary arthritis in the cervical spine, although early cases have no obvious outward signs.
Body soreness and exercise intolerance are common in horses with silicate associated osteoporosis, and some horses may develop neurologic signs. Fractures are most common in the spine, ribs, pelvis and shoulder blades. Affected horses may or may not have respiratory signs, but will typically have some degree of respiratory involvement.

Diagnosis of silicate associated osteoporosis is simple in advanced cases, where outward signs alone are diagnostic. In mildly affected horses, diagnosis is challenging, because vague lameness or stiffness may be the only signs (as can be seen in countless other disease processes). In these cases, nuclear scintigraphy (bone scan) is very sensitive at detecting the disease. Ultrasound of the shoulder blades and x-ray images of the neck can help define the disease as signs progress, but will often be normal in early cases.

Treatment for silicate associated osteoporosis with typical anti-inflammatories such as phenylbutazone is often minimally effective. Sometimes steroids will improve the comfort level, but not always. Intravenous Legend® can help with the arthritis pain in the neck that commonly develops, but does not help with bone pain. Tildren® may help decrease bone pain and possibly stop the progression of osteoporosis. Tildren® is in the same family of drugs as Actonel®, Fosamax®, and Boniva®, which are used to treat osteoporosis in people. Recently, zoledronate (Zometa® or Reclast®) has been used experimentally at UC Davis, with promising results.

Prevention of Silicosis
Prevention of silicosis requires limiting the amount of inhaled silicate dust. Areas of new construction should be avoided. Dry lot situations should be altered as much as is possible. The ideal solution is to plant grass over the area and irrigate throughout the summer months, but this is often very impractical. Incorporating organic material into the soil can help to retain moisture and minimize dustiness. Wood chips or composted manure are fairly effective and inexpensive methods. Topsoil brought in from an unaffected area may also be effective.

Future Directions in Silicosis Study
Control of the excessive immune response is the primary direction of research in the human field. In horses, the primary areas of study involve silicate associated osteoporosis. We are currently working in conjunction with researchers at UC Davis on studies to determine the exact nature of the bone disease. Currently, Dr. Murray is studying two blood tests, which appear to be promising in detecting the disease process. With earlier detection and monitoring of bone density, we hope to be able to prevent the catastrophic fractures and other bone-related pain.

Matt Durham, DVM grew up in Reno, Nevada. During the summers growing up, Dr. Durham worked in the Sierra Nevadas as a backcountry guide at McGee Creek and Mammoth Lakes Pack Outfits, where he met his wife, Tiffany. He attended Cal Poly, San Luis Obispo, and obtained a degree in Animal Science. After graduating from veterinary school at UC Davis, he performed a one year internship at Alamo Pintado Equine Medical Center in Los Olivos, California. After four years in practice, he performed a one year fellowship in large animal cardiology and ultrasound at the University of Pennsylvania's New Bolton Center. Dr. Durham has been at Steinbeck Country Equine Clinic since 2001.