

**SUBMISSION ON AN APPLICATION FOR RESOURCE CONSENT UNDER SECTION 96 OF THE RESOURCE MANAGEMENT ACT 1991**

**PART A: DESCRIPTION OF APPLICATION**

CONSENT NUMBER: WCRC: RC-2023-0046, GDC: LUN3154/23

APPLICANT: TIGA MINERALS AND METALS LTD

DESCRIPTION OF PROPOSED ACTIVITY: Establish and operate a mineral sands mine, including construction of associated infrastructure.

LOCATION: Barrytown Flats, west of State Highway 6 (Coast Road), 9km south of Punakaiki township and 36km north of Greymouth

**PART B: SUBMITTER DETAILS**

Full name/s: Bevan Chignell

Postal address: [REDACTED]

Email address: [REDACTED]

Phone numbers:

Mobil: [REDACTED]

Date: 8/10/2023

Name (BLOCK CAPITALS):

BEVAN CHIGNELL

I oppose the application

I wish to be heard in support of my/our submission.

If you wish to be heard, and others make a similar submission would you consider making a joint case with them at any hearing. **No**

If you indicated you wish to be heard, you will be sent a copy of the S.42A Officer's Report and a copy of the Decision once it is released. Please indicate below which format you would like to receive these documents in: **Electronic copy**

I/we **have** served a copy of my/our submission on the Applicant as per Section 96(6)(b) of the RMA **Yes**

**I am not** a trade competitor for the purposes of section 308B of the Resource Management Act 1991.

I request, pursuant to section 100A of the Act, that you delegate your functions, powers, and duties to hear and decide the application to 1 or more hearings commissioners who are not members of the local authority.

## Submission

I wish to express my complete opposition to the proposed TiGa Minerals & Metals Barrytown mine.

I base this opposition on 4 main grounds.

1. Noise impacts of trucking will contribute to increased stress levels and negative health outcomes for those living along the trucking routes.
2. The impacts of heavy trucking on our already over-congested roads unfairly burden those of us who live here and travel these roads daily for work, medical appointments etc.
3. Environmental impacts are potentially significant.
4. Social harm outweighs any economic benefits.

## Noise impacts

It is my contention that many people, not only those neighbouring the mining site, but also those who live along the transport routes SH6 (including ourselves) and in the Westport/Greymouth urban environment will be adversely and significantly affected by the mining truck movements particularly during the quieter periods of the day.

There is also a significant body of research that indicates road noise has a harmful impact on our native birds, geckos, frogs etc.

The European Environmental Agency reports, “that noise ranks second only to air pollution as the environmental exposure most harmful to public health”.<sup>1</sup> The impacts of noise can occur at relatively low levels and constitute a significant stressor for human health.

Marshall Day believes that the noise effects will be acceptable to the mine’s neighbours.

Unfortunately, the Marshall Day experts demonstrate an extraordinarily simplistic, one-dimensional understanding of how noise travels and its impact on humans and wildlife. Their use of what they deem to be ‘acceptable’ noise levels is based on a very shallow understanding of the power of noise to do harm to humans and wildlife.

Any discussion of noise impacts needs to explore both sound intensity (volume) and frequency/pitch/tonal quality. First, a very basic explanation. Any sound is made up of a fundamental note with additional layers of harmonics or overtones both above and below (in pitch) the fundamental note. Many of these harmonics are inaudible to the human ear but these harmonics, along with the fundamental, give each sound its specific character.

These characteristics also help to determine how a specific sound will travel and how annoying or painful that sound can be. This partly explains why some sounds can be more painful and penetrating than others. The way sounds travel can be very difficult to predict and conditions such

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<sup>1</sup> <https://hms.harvard.edu/magazine/viral-world/effects-noise-health>

as wind, humidity, and natural features such as bluffs can even increase the impacts of noise at a great distance.

The inability of Hutt and Wellington councils earlier this year to find bush parties that triggered numerous noise complaints serve as an example to explain these points. And as anyone who has been affected by party noise while trying to sleep can testify: it doesn't have to be loud to be penetrating and insanely irritating. Those incessant bass beats coming through the walls and closed windows can be 50dB or less yet still have a significant impact on your quality of life.

One more general point about sound that needs clarification. The Marshall Day experts claim that sounds such as a 3dB difference in volume are barely perceptible and therefore cannot have an effect. This is not true. Here's a fun site where you can test your own ability to perceive a 3dB difference: [https://www.audiocheck.net/blindtests\\_level.php?lvl=3](https://www.audiocheck.net/blindtests_level.php?lvl=3)

Likewise so-called inaudible frequencies can also have negative impacts on our nervous systems. Research by neurobiologist Markus Drexler and colleagues at the Ludwig Maximilian University in Munich, Germany clearly shows that 'inaudible' sounds as low as 30Hz can have possibly detrimental effects on hearing health.<sup>2</sup>

Marshall Day also ignores the cumulative impacts of unwanted noise as a stressor for those forced to live with it and instead trumpet the fallacy that it's just a small average increase throughout the day. As if that somehow reduces the impact of yet another truck rattling your windows or disturbing your sleep.

They also raise the issue that natural background noise mitigates the impacts of truck and mining noise. The Tonkin and Taylor report also promotes this fallacy that if you have more noise loud/ vibration it masks the other loud noises /vibrations. Masking noise does not reduce its impact; it very much depends on the types of noise involved. Put simply, sounds can have a significant impact whether they are audible/ distinguishable or not.

Let's explore these points in more detail and look at the overwhelming research about the negative impacts of noise.

## General impacts of noise on human health and wildlife

*"According to the [WHO](#) (World Health Organization), noise pollution is one of the most dangerous environmental threats to public health. According to the [European Environment Agency](#) (EEA), noise is responsible for 16,600 premature deaths and more than 72,000 hospitalizations each year in Europe alone."<sup>3</sup>*

Even the NZ Transport Agency admits:

*"Long-term exposure to transport noise and vibration can have significant impacts on human health, primarily related to sleep disruption and stress, and the resulting health impacts. Other impacts may include speech interference, cognitive impacts, and psychological and behavioural impacts."*

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<sup>2</sup> <https://www.science.org/content/article/sounds-you-cant-hear-can-still-hurt-your-ears>

<sup>3</sup> <https://earthandhuman.org/noise-pollution-effects/>

*Humans are very sensitive to vibration, and the effects of vibration on human health and wellbeing are similar to noise. Vibration can cause sleep disruption, stress and annoyance. Vibration may be ground-borne or arise from sound that causes secondary vibration (eg window rattles). Both forms of traffic-induced vibration may produce resonance, which is perceived as sound or as a body vibration.”<sup>4</sup>*

These health impacts can include:

- Hypertension and ischemic heart disease
- Annoyance
- Sleep disturbance
- Reduced performance
- Cognition problems
- Mental stress

The WHO believes that *“the evidence on low-frequency noise (e.g. heavy duty vehicles, public works) is sufficiently strong to warrant immediate concern. ... Health effects due to low-frequency components in noise are estimated to be more severe than for community noises in general.”<sup>5</sup>* In other words, the noise from trucks is more harmful than the noise from cars or ambient noise such as the sea or the wind even when at the same dB level.

For many residents along the proposed transport routes and around the mine, the increased truck movements with the low frequency noise and associated vibrations, (and you can add in sudden, harsh sounds such as engine braking etc) particularly during the quieter periods, are a real concern.

### **Intermittent and low intensity noises are still harmful**

Many researchers point out that intermittent noise can be significantly more disturbing than constant noise, especially when it occurs during sleep. This makes a nonsense of Day’s claim that the increased truck movements constitute only a small, hardly noticeable increase and when you average it out, ‘well , we don’t think it’ll be a problem’. They’re not living with it day after day, night after night.

Furthermore, the impacts of noise can occur at much lower sound intensities than previously thought.

A recent study showed that *“people who were exposed to airplane noise at levels as low as 45 dB were more likely to sleep less than 7 hours per night.”<sup>6</sup>*

The WHO Guidelines for Community Noise states quite bluntly that, *“...continuous noise in excess of 30 dB disturbs sleep. For intermittent noise, the probability of being awakened increases with the number of noise events per night.”<sup>7</sup>*

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<sup>4</sup> <https://www.nzta.govt.nz/planning-and-investment/learning-and-resources/benefits-management-guidance/the-land-transport-benefits-framework/healthy-and-safe-people/3-changes-in-human-health/3-3-impact-of-noise-and-vibration-on-health/>

<sup>5</sup> <https://www.who.int/publications/i/item/a68672>

<sup>6</sup> Boston University School of Public Health. "Exposure to airplane noise increases risk of sleeping fewer than 7 hours per night." ScienceDaily. ScienceDaily, 1 May 2023. <[www.sciencedaily.com/releases/2023/05/230501143012.htm](http://www.sciencedaily.com/releases/2023/05/230501143012.htm)>.

Unfortunately, even when a noise doesn't necessarily cause you to fully wake up it can reduce your quality of sleep with reduced deep sleep periods, leading to reduced performance and increased stress levels. This is confirmed by researchers such as Westman & Walters, who state that, "*sound can produce orienting and defensive responses and alter the quality of sleep without causing awakening.*"<sup>8</sup>

Although the trucking amendments as outlined in the T&T report limit trucking movements to before 10pm and only after 5.00am, the reality is many people are trying to sleep before 10.00pm and just as many do not want to have their sleep disturbed at 5am either. This includes children, elderly and ordinary everyday workers.

Sadly, according to researchers at Massachusetts General Hospital, "*even those who tune out noise pollution, whether when awake or asleep, **experience autonomic stress reactions.***" These researchers "*have used advanced PET scanning to show that **transportation noise** is associated with heightened activity of the amygdala relative to regulatory cortical regions. Amygdalar activity can trigger stress pathways, including inflammation, that can lead to cardiovascular and metabolic diseases.*"<sup>9</sup>

The Marshall Day experts try to minimise the stated impacts of truck noise at night time by claiming that there are already vehicles using the SH6 during the hours of 10pm to 6am. However, they deliberately avoid stating the fact that of the average 9 vehicles using the SH6 between 5 and 6am for example, few if any (from my experience) are trucks. This also applies to the hours after 8pm.

Some would argue that this is a State Highway and so noise is inevitable but the reality is that for large parts of each 24 hour period (evenings and for quite some time into the mornings on Sundays and public holidays) SH6 is an extremely quiet road. It cannot be compared with SH1 between Christchurch and Timaru, for example.

The updated Tonkin & Taylor report implies that night time trucking only involves 2 hours up to 10.00pm. Those evening hours are vital preparation for a good night's sleep. Most people need time to unwind after stressful days and listening to how effectively the sound/vibration of yet another truck passing is masked by the sound of the truck passing in the other direction is not how most people like to relax.

One more comment here about the nature of truck noise as it affects us personally. The topography and site of our house and the orientation of the road relative to our house means that the noise from a single truck can be clearly audible for up to two minutes both before and after passing our house. For that period it becomes the dominant noise in our soundscape and, depending on the wind direction, can penetrate and is clearly audible inside our house with all windows and doors shut.

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<sup>7</sup> [https://www.researchgate.net/profile/Hiral-Jariwala/publication/319329633\\_Noise\\_Pollution\\_Human\\_Health\\_A\\_Review/links/59a54434a6fdcc773a3b1c49/Noise-Pollution-Human-Health-A-Review.pdf](https://www.researchgate.net/profile/Hiral-Jariwala/publication/319329633_Noise_Pollution_Human_Health_A_Review/links/59a54434a6fdcc773a3b1c49/Noise-Pollution-Human-Health-A-Review.pdf)

<sup>8</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1568850/pdf/envhper00468-0281.pdf>

<sup>9</sup> <https://hms.harvard.edu/magazine/viral-world/effects-noise-health>

## Ambient noise

The acoustic report states:

*“Daytime ambient noise levels during fine, calm conditions were measured to be 53-58 dB LAeq(52-60 dB LA10) at locations representative of the dwellings near State Highway 6, which suggests that a noise limit of 55 dB LAeq would be appropriate at these dwellings.”*

This broad statement takes no account of the fact that different sounds are more harmful, annoying and penetrating than others. This goes back to the earlier discussion (intro) of fundamentals and harmonics. We’ve already seen how research shows low frequency noise such as trucks is more harmful than other similar volume noise. Likewise, we all know how intensely irritating the bass beats of an unwanted party can be.

The problem here is that dB readings give only a very limited picture of the impacts a given noise will have. We need to go deeper into the structure of sound (hence my explanation in the intro). The fundamentals and harmonics operate at different frequencies. Our ears (and bodies) are programmed to be more sensitive to certain frequency ranges-- typically between 2,000 and 5,000 Hz.

The second issue with Day’s fallacious argument is not everyone along the transport route experiences that same ambient noise. For us personally, the sea is more distant and the loudest evening/early morning noises are generally the Moreporks, Wekas, Tuis, Bellbirds etc. The roar of trucks is felt as a very significant incursion into the soundscape. Unfortunately, these unwanted impacts on the human nervous system can rapidly become cumulative leading to some of the negative health outcomes mentioned earlier.

## Environmental impact

Increased truck movements both during the day time and at night will have a significant and negative impact on our already struggling native birdlife and fauna. This is due to three key reasons.

1. It goes without saying that increased truck movements will lead to an increase in road kill numbers for our flightless birds.
2. Lighting, and particularly the extraordinarily bright beams used by some trucks today, will create a serious disturbance for both nesting birds and birds that are on the move in the dark.
3. Research<sup>10</sup> shows that increased road noise can significantly increase stress responses in bird, lizard and frog populations near roadsides. This stress is the result of inability to hear predators, masking communications such as bird calls, as well as potentially causing some hearing loss.

NZTA itself states that “many of New Zealand’s native animals are forest dwellers. Their habitat quality is degraded by road noise, artificial light,...”<sup>11</sup>.

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<sup>10</sup> <http://dx.doi.org/10.1098/rsbl.2016.0113>

<sup>11</sup> <https://www.nzta.govt.nz/assets/resources/research/reports/692/692-road-edge-effects-on-ecosystems-summary.pdf>

These negative impacts will be felt not just around the mine site but all the way along SH6, in both directions, towards Greymouth and towards Westport.

### **Social harm outweighs any economic benefits**

This project provides minimal benefit to the area as most funds will go to its Australian owners. In particular, very few of those who actually live along SH6 will benefit in way shape or form from this proposal. In fact, as already discussed, most of us will be negatively affected. We will pay the price for yet another project that places rampant greed above environmental and social benefits.

Aspects of this social harm also include the damage to an already fragile yet essential road, increased frustration with longer driving times to important appointments such as getting to our superbly well appointed 'hospital' in Greymouth, and dangerous truck manoeuvres (crossing the white line, hurtling through narrow bridges, holding up and refusing to let motorists pass).

**I seek the following decision from the Local Authority: that the application be declined in its entirety.**