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20 August 2014

Department of Conservation
Westport Office
72 Russell Street
Westport 7825

Ref: S12073

Attn: Judi Brennan/Toby Wilkes

Dear Judi and Toby

PAC 11-04-431/PAM 11-07-41279 Rangatira Developments Limited – Request for Further Information for Te Kuha Access Arrangement and Concession Applications

This letter refers.

The following responses have been received from the personnel engaged by Rangatira Developments for the Te Kuha Limited Partnership project. The responses coincide with the numbering contained within the letter dated 1 August 2014.

HAUL ROAD CONSTRUCTION

1. ***A detailed design plan showing cut/fill footprint areas***
2. ***Further detail on how stockpile volume will be managed. Will it be stockpiled along the road, at the mine, on the private land? If stockpiled along the road what would be the implications for total footprint etc***
3. ***Comment/opinion on the potential cut depth within 'pakihi' areas. Experience on the West Coast suggests depths of 2m are sometimes required to get suitable base material. This means a lot of material, stockpile volume and implications for 2 and therefore 1 above.***

This information will be provided in the next few days under separate cover.

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MINE PLANNING/OPERATIONS

The latest version of the mine plans were uploaded to dropbox and made available to Toby Wilkes and Mark Smith in the week 11 – 15th August. This version is dated June 2014.

LANDSCAPE

<u>Photosimulations</u>

4. ***That the photosimulation methodology be provided, including the information on which the 3D computer model is based, so that the photosimulations can be verified.***

The methodology for the photosimulations is attached to this letter.

5. ***That viewpoint 13 is re-done with a better quality photo (requested because it is arguable the most important viewpoint).***

The viewpoint from the Buller Gorge has been redone with a better quality photo. The content of visual simulations and the reference to viewpoints have been updated in the most recent Graphic Attachment dated August 2014. Rough and Milne have also added two more photo simulations from Mt Rochfort and Buckland Peaks.

6. ***That photosimulations be prepared from the three additional viewpoints below(however these will need to be confirmed on site):***

    a. ***From SH6 in the lower Buller Gorge west of ' Horseshoe Bend' (from maps it appears that the mine may be visible on the skyline from some placed on this section of road. If this is correct, a further photosimulation might be warranted from this location for the reasons given in paragraph 10 above. Either way, further information on the visibility of the mine from this section of road is warranted.***

        In general, views from within the Buller Gorge are heavily screened by roadside vegetation making it very difficult to get a clear view of the skyline affected by the mine. Intervening topography also screens views of the mine site. The Buller Gorge Viewpoint is the only clear salient viewpoint showing the full extent of the mine along the ridgeline. Only partial views are obtained for a short distance either side of this viewpoint through roadside vegetation.

    b. ***From SH 6 opposite the loading facility at Te Kuha (at the entrance to the Lower Buller Gorge). With regard this viewpoint it would also be useful if the extent of vegetation clearance around the loading facility was quantified (the assessment currently says the vegetation clearance will be no more than necessary (p.49), in particular the extent to which vegetation clearance affects visibility of the facility from SH6.***

        As detailed on pages 47 & 48 of the original landscape assessment, the facility has not been fully designed. So far Rough and Milne have noted *'the proposed facilities area will be within 650m of SH6 immediately before the highway*

enters the *Buller Gorge and the facilities area will be within 120m of Nine Mile Road. Despite the close proximity to public and scenic roads, the structures and activity will be well screened from views obtained from SH6 by existing vegetation on the Stevenson Mining Limited land and by vegetation existing on both sides of the Buller River.*

c. ***From Mount Rochfort. Although people need to go out of their way to reach this site, it is a public viewpoint, and a photosimulation overlooking the site from such an elevated viewpoint would help understanding of the project.***

   A photosimulation has been included from Mt Rochfort. The reference is the graphic attachment dated August 2014, viewpoint 12, sheets 68 – 74.

<u>Lower Buller Gorge</u>

7. ***A closer appraisal of the existing landscape values of the Lower Buller Gorge, including a professional view on whether it is an ONL or not***

   Rough and Milne consider it inappropriate to assess a portion of a landscape as to whether it is an ONL and accept the findings of Brown NZ Ltd who have considered the Lower Buller Gorge in the context of the whole Buller District and found it to be an ONL. Page 13 of the original landscape report from Rough and Milne mentions the Brown NZ Ltd Landscape Assessment of the Buller District, and identified the east facing slopes of the site as an ONL and Section 4.8.4 Lower Buller Gorge where Rough and Milne describe the landscape values associated with the Lower Buller Gorge. In Section 5 Landscape and Visual Amenity Values of Te Kuha Coal Project Site, under sections 5.2, 5.3, 5.4 and 5.5 Lower Buller Gorge values are referred to. In addition, Section 8.1 Outstanding Natural Features and Landscapes specifically discusses the effects of the proposed mining activity on the ONL.

8. ***A more detailed analysis of the visibility from within the Gorge and effects on the sequence of views travelling through the Gorge***

   See below for response to points 8 and 9.

9. ***An appraisal of such visual effects on the overall landscape value of the Gorge.***

   Rough and Milne have undertaken this is relation to Viewpoint 11 , Buller Gorge, because the visibility of the mine site is very limited within the Gorge itself and in fact is restricted to the immediate vicinity of Viewpoint 11. Viewpoint 11 is in the centre of a very short section of SH6 where the only clear view of the site is obtained within the Buller Gorge. It is only for a short distance either side of this viewpoint that partial views of the site through roadside vegetation may be obtained. Section 7.13 (pages 59 – 60) and Table 2 Landscape and Visual Effects (page 65) address this.

<u>Mine plan and eastern ridgeline</u>

10. ***Sheet 7 of the Graphic Supplement appears to depict finished contours for years 1 to 3 and most of year 4, but only existing contours for years 5 to 8 and the balance of year 4.***

The areas for which finished contours are not provided comprise the skyline where the potential effects are greatest. Similarly, it is difficult at face value to reconcile the 3D computer model/photosimulations depiction of the existing and finished landform with the description of backfilling provided in the Assessment. For instance, the 3D model and photosimulations appear to depict backfilling along the ridge, but the description on pages 43 – 44 says that overburden from years 4 – 8 will be moved downhill and not returned to the ridge following mining. It may be that the tones used in the diagrams lead to misinterpretation. It would therefore be useful to have both existing and finished contours for the mining site to enable the earthworks to be understood more closely and the 3D model checked.

These concerns relate to the Graphic Attachment dated May 2014. The mine design plan has since been updated and refined. Accordingly, the description of effects on the landscape particularly the ridgeline have been revised and all photo-simulations have been amended. From four key viewpoints photo-simulations show a sequence of mine activity throughout the life of the mine (19 – 20 years). The photosimulations from these four viewpoints (Norris Creek, Buller Gorge, Mt Rochfort and Bucklands Peaks) include a key identifying the areas of land affected on the mine site, the dump areas, stockpile areas, and the sequence of temporary and final rehabilitation to assist in understanding the mine project.

11. ***Information /discussion on the practicality or otherwise of reconfiguring mining to avoid the area east of the ridge, or backfilling to the ridge-top mined area.***

    The practicality and alternatives have been considered in the latest mine design and it is understood that this will be outlined in the application by those experts familiar with the many issues involved. The landscape and visual assessment addresses the current mine proposal. Rough and Milne understand that other experts involved in mine planning and design have given consideration to alternative methods and in doing so have evaluated the pros and cons or augering the coal seams from the western side and mining and backfilling the east facing ridge. Providing a discussion on the practicality is outside the area of expertise of the landscape experts but given the proposal is to mine the area east of the ridge and backfill the ridge top mined areas, the assessment has been made of the effects of this proposal.

ECOLOGY

<u>Aquatic</u>

12. ***Completion of baseline monitoring, including adult insects to assess potential re-colonisation success, as well as a repeat of the aquatic ecology monitoring report under average flow conditions***

    Adult insect monitoring

    There are a variety of ways that a stream fauna can recolonize a denuded stream or freshwater habitat: organisms drift down from upstream environments (both accidentally through dislodgement and purposefully through behaviours); translocation by other animals, especially birds; movement or wind blow across land; and through the laying of eggs by the

females of the adult stage of aquatic insects. The role of adult aquatic insects is critical to the continued sustainability of aquatic communities, and there is a need to maintain or create habitat for adult insects.

For the proposed Te Kuha mine, the streams and their habitats of the upper mountain will be removed completely, thus removing any ability for the recolonization of future rehabilitated streams from these natural cycles. Thus the rehabilitation of the stream post-mining will be dependent on the translocation of insects from neighbouring streams to 'seed' the new streams. Success will also depend on recreating the associated riparian habitat for the adult insects.

We are not convinced that additional adult aquatic insect monitoring at this stage is necessary or will add any additional information; the adult communities of aquatic insects reflects the insect communities already occurring within the stream. It is known that the streams contain a number of aquatic insect species; several species belong to the mayflies-stoneflies-caddis flies (commonly referred to as EPT); and generally regarded as representing higher ecological value. The rehabilitation plan will detail how the streams will be rehabilitated on site along with their respective habitat, riparian habitat and thus adult insect habitats. Post-rehabilitation monitoring of the instream fauna will reveal the success of rehabilitation.

Follow up aquatic surveys

As the reviewer has indicated, the initial aquatic surveys were undertaken during a period of drought conditions. As a consequence a follow up survey was undertaken in December 2013 and the results are reported and referred to in the Golder 2014 AEE report. The full survey was not repeated at this time and the purpose of the December 2013 site visit was to confirm the conclusions from the earlier surveys during baseline flows in the streams of the upper mountain. The additional December 2013 surveys confirmed the earlier findings as reported in the earlier Access Agreement application (Golder 2013). We consider that the findings as reported represent the aquatic ecological characteristics of the site.

13. Further information on koura mitigation, specifically the 'capture/rescue' process and identification of alternative receiving habitat

As part of the application for access agreement, the need for a koura rescue and relocation plan was highlighted. The Golder (2014) AEE provides more detail to a Koura Rescue and Relocation Plan (KRRP) as part of a suggested resource consent condition as follows:

Koura rescue and relocation

The Consent Holder shall submit a draft Koura Rescue and Relocation Plan (KRRP) to the Manager at least 30 working days prior to Work commencing. The final KRRP will be

submitted for certification, and a copy provided to WCRC and DOC, at least 15 working days prior to Work commencing.

The KRRP shall be prepared by a suitably qualified ecologist. All capture and release of koura shall be undertaken by a suitably qualified ecologist.

The KRRP will include details of koura rescue and relocation techniques to be used, including (but not limited to):

- The Plan shall detail the process and timing for obtaining the relevant permits for the removal and transfer of koura from the mine site to the identified and agreed receptor locations.
- The Plan shall detail the receptor location(s) proposed to receive the captured koura.
- The Plan shall include placement of appropriate screen to stop koura migrating back into the reach to be diverted while the rescue operation is being carried out.
- Detail the use of multiple koura capture methods over multiple nights days/nights (at least 2 days/nights and ceased only when no more koura are caught, or through agreement with the Manager). Koura capture methods may include spotlighting, minnow traps, and electric fishing, suitable to the habitat, post screen installation and prior to any works that may affect the aquatic habitat.
- The methods of transfer proposed for the captured koura.
- The location and use of temporary holding (refuge) pools within the stream or alternative stream or reach to be diverted.
- The method of draining the water body to ensure maximum koura rescue (if relevant).
- The methods of capture (and transfer) from any temporary holding location.
- The methods to record, count and measure all koura caught and transferred.
- The Plan shall guide all works in any permanent or intermittent water body (including tarns and wetlands) that is to be lost, diverted or reclaimed (including temporary diversion for culvert placement).
- The details of the koura rescue and relocation shall be reported to the Manager, WCRC.

14. ***Further detail on proposed approach/methodology for stream restoration/reconstruction within mine footprint and the reinstatement of tarns***

A response to this query has been provided in the response from Mitchell Partnerships. In summary, the long term ecological objective of the stream reconstructions would be to create a similar amount of stream habitat (stream length and area), quality of stream habitat, water quality and benthic macroinvertebrate and fish community diversity and abundance to that which existed pre-mining. The proportion of habitat types, stream gradients and water velocities may differ from that currently occurring at the mine site but the overall biological communities of the rehabilitated streams is likely to be the same as presently found at the mine site.

The new stream channels are not expected to support biological communities that are similar to the existing channels within the life of the mine. One of the key short term (0 – 2 years) objectives of the reconstructions will be to establish and maintain indigenous vegetation on the stream banks so as to reduce stream bank erosion and sediment inputs and improve water quality.

We note that fish are absent from the streams on the upper mountain and therefore there are no plans to provide access for fish to the upper mountain as part of the stream rehabilitation. .

The rehabilitation plan for the mine site is expected to include the formation of small tarns to ensure the presence of habitat for those species that are limited to these poorly drained areas and contribute to restoring overall habitat diversity at the site once mining is completed.

15. ***Baseline data for turbidity is provided for key streams affected by the haul road***

    A report on water quality is expected to indicate the baseline water quality conditions of the site. Where turbidity data is insufficient for stream sites along the haul road, baseline turbidity data will be gathered as part of a construction environmental management plan. It is worth noting here that information on the risk of Acid Mine Drainage (AMD) is expected to be included in the pending report on Water Quality. Once received then the aquatic ecology AEE will be updated to respond to this information, and include how any effects of AMD on aquatic ecology will be managed

16. ***Confirmation that [the design of] culverts used for the haul road will retain fish passage***

    It is expected that the design of culverts used for the haul road will retain the ability for passage of fish from the lower to upper catchments at each stream crossing. We note that it is our understanding that the main streams will be crossed using bridges. As indicated above, we note that fish are absent from the streams on the upper mountain and therefore there are no plans to provide access for fish to the upper mountain.

<u>Avifauna</u>

17. ***Combining the vegetation map with bird count stations and transect routes within a GIS. This would provide a clearer picture of the bird species present within the mine footprint including their respective habitat associations.***

    A combined map as requested above has been provided and is attached to this response.

<u>Lizards</u>

18. ***More information on the potential ability of the West Coast green gecko to recolonize post-mine landforms. Providing further information on the Marshall Mine example referred to on page 69 of the Ecology Report may be useful.***

Recolonization rate and ability will depend on proximity to the nearest intact habitat remaining for the species and the nature (and success) of habitat rehabilitation as well as the demography of the surrounding population at the time rehabilitation is completed. Sites that are rehabilitated by restoration planting will likely take many decades before they are suitable for geckos. Vegetation direct transfer, if successful, may offer some suitable habitat for the species in a much shorter time-frame, however we recognise that neither method can fully replace habitats lost and accept this loss should be mitigated.

19. Comment/opinion on the likely significance to West Coast green gecko population of the mortality of individuals within the mine footprint and habitat loss/alteration.

Mitchell Partnerships are of the opinion that there is insufficient knowledge about the West Coast green gecko population as a whole to comment on the significance of the proposal, except to note the following:

1) West Coast green gecko was not detected during the survey at Te Kuha. However, their presence has been inferred from the types of habitat present within the survey area, which we consider are suitable for West Coast green gecko, and from other records in the vicinity (e.g. Denniston and Stockton). The Te Kuha area is also within their known range. The weather during the Te Kuha survey was quite warm, which is not ideal for detecting West Coast green gecko by day. To confirm their presence additional survey would be required and the chances of success, even if West Coast green gecko is present, are probably low.

2) This lack of confirmed presence is unsurprising. In the 15 years since 1997 there have been eleven lizard surveys with respect to coal measures vegetation which are summarised in Appendix 1. These surveys have used a variety of methods to detect lizards including visual scanning, spotlighting, pitfall trapping, live trapping using gee-minnow funnel traps, refugia searches / hand searching, artificial cover objects and the use of a lizard detector dog certified under the Department of Conservation's Conservation Dogs Programme. The most successful lizard surveys have been at Millerton, where the detection rate is relatively high and the species present include forest gecko and speckled skink. In the Upper Waimangaroa and Denniston areas, lizard detection rates have generally been lower. Of the eleven surveys, ten have provided information about lizard numbers and not all of them have quantified the search effort. Nonetheless a total of 48 lizards have been recorded in these ten surveys including 34 forest gecko, four West Coast green gecko and six speckled skinks. An additional West Coast green gecko was encountered during the surveys for Solid Energy's Stockton hydro project, bringing the total number of West Coast green geckos recorded to five. These records were generated from at least 176 hours of survey effort, although as noted earlier not all the surveys have quantified search time.

3) Accepting that West Coast green geckos are likely to be present and use habitats at Te Kuha, it is likely that they are present in equivalent or lower densities than at other coal measures locations which have been surveyed (described in point two above and in Appendix 1). Gecko density is likely to be low and distribution patchy. Unfortunately there are no density estimates available for this species from any site within its range.

4) We consider it is most likely that any West Coast green geckos present would be killed during mining operations. It remains unknown how significant this would be at a population

level because both the number of gecko at Te Kuha and the number nationally remain unknown. Given the conservation threat ranking of West Coast green geckos ("nationally vulnerable") the loss of any individuals or habitat is of concern and should be adequately mitigated.

5) The effects of pest control and pest control agents on lizard populations remain unconfirmed in most situations in New Zealand, but we consider that the key to successful predator control for lizards is likely to be including rodents as well as the larger predators (mustelids, hedgehogs and cats) and having a sufficiently-large area (including a sizeable trapping buffer) to reduce predator re-invasions, as is the case for some other sensitive fauna. The proposal to carry out pest control to mitigate loss of West Coast green gecko is based on this assumption.

20. Further discussion/exploring of potential options to avoid West Coast green gecko habitat

Given the fixed location of the economic coal resource we do not see any potential for avoidance of lizard habitat if mining is undertaken.

Bats

21. Information on the habitat and characteristics of sites where ABMs were placed and the weather conditions during each night for each ABM

The field notes taken at the time of each ABM night are included in Table 1 below

Table 1: Habitat descriptors for each automated bat detector at Te Kuha.

Unit Number	Effective Number of nights	General Location	Habitat
WS01	10	Upper Orowaiti River	In tall mixed forest (red beech around) next to slow and pooled creek - forest overhung
WS08	10	Upper Reservoir	Overlooking Reservoir in manuka shrubland - odd rata, rimu etc around
WS05	10	Lower Reservoir	Overlooking Reservoir in manuka shrubland - odd rata, rimu etc around
WS04	11	Buller River North Bank	Overlooking slow and big pool Buller River
WS11	10	Buller River North Bank	Overlooking slow small pool and side creek junction

			on Buller River edge
WS02	11	Overlooks Coal Ck left and right branch junction	Tall forest and farmland with bush edges in area
WS13	9	Overlooks junction of Jones and Ballarat Cks	Tall mixed forest and manuka shrubland in area
WS14	17	Summit Ridge: overlooks subalpine saddle	Manuka shrubland, stunted and tall mix forest
WS09	14	Summit Ridge: overlooks subalpine saddle	Manuka shrubland, stunted and tall mixed forest
WS03	14	Upper Coal Creek: Trib of Coal Ck (25m distant).	In tall mixed forest above pooled side creek

The 10 detectors were established at sites where the experts considered bats most likely to forage or roost: e.g. older forest, forest edges, or near streams or ponds. Most of the sites considered to offer the "best" habitat for bats were outside the mining permit, but within flight range of it (long-tailed bats can fly up to 20 km from roost sites). The reasoning was that evaluating presence/absence of bats at the most favourable sites, even if outside the mining area, had more value to the overall bat survey than locating detectors randomly within the affected area. Site locations included four sites within the mining permit (one within the proposed mine site) and six sites outside the mining permit as discussed in the Mitchell Partnerships report.

Weather conditions during the ≥ 10 nights the detectors were deployed were predominantly fine and mild, therefore ideal conditions for recording bats had they been present. However, it is acknowledged that bats (especially short-tailed bats) are very cryptic, or may visit the area seasonally. Therefore bats could have been missed during the current survey.

To put the 116 nights of bat recording undertaken at Te Kuha in context, previous sampling for bats at Te Kuha was very limited. Garrick (1986) did not use electronic equipment to detect bats but relied on visual surveys for flying bats at dusk. This method is only appropriate for long-tailed bats that leave their roosts soon after sunset. Mitchell Partnerships & Landcare Research (2001) deployed only a single bat detector, set on only one frequency (45 kHz) to detect long-tailed bats, on only one night (exact date not specified, but within period 29 November – 1 December 1999). No bats were detected during these surveys, though Garrick (1986) reported that M. Daniel (New Zealand bat expert) knew of bats (probably long-tailed bat) being present in the area at that time.

Short-tailed bats have not been recorded in the Ngakawau Ecological District and for that reason are unlikely to be present. The nearest known population of short-tailed bats was in the Oparara valley near Karamea, but recent surveys have failed to find them and they are now believed to be locally extinct.

Overall results of several bat surveys carried out in the Buller region and other parts of the West Coast since the 1990s have found only patchy distributions and generally low density populations of long-tailed bats as shown in Appendix 2. Highest densities of bats were recorded in inland forests on the river flats above the forks of the Mokihinui River north of Westport and

Kiwi Flat in the Waitaha Valley south of Hokitika, but even these populations were small compared to some Fiordland populations.

No recent records of bats have been obtained from the lower Buller Valley area or the Orikaka Valley where extensive bat surveys were carried out in summer 1998 and more recently (R. Buckingham, pers. comm.). The only known recent bat record relatively close to Te Kuha was of a single pass on the Stockton Plateau in 1997, but this record has not been substantiated by any of the many more recent surveys in the area undertaken on behalf of Solid Energy.

Recent surveys using modern effective bat detector devices have not detected bats in the Denniston, Stockton or Mt William Range areas.

In light of these observations the absence of bat detections in the Te Kuha area is not altogether surprising.

While the absence of detections does not necessarily mean an absence of bats, Mitchell Partnerships consider that the available evidence from the accumulation of bat survey results in the general area indicate that if bats are present at Te Kuha, they occur in very low numbers (e.g. as seasonal visitors or with very localised roosting and feeding sites).

Although there is tall forest within the proposed access route, the proposed mine site comprises mainly low-stature scrubland vegetation that is not suitable bat roosting or breeding habitat. Mitchell Partnerships therefore consider that their conclusions with respect to bats are robust.

<u>Invertebrates</u>

22. Invertebrate survey should be done again in more favourable conditions, as detailed in the further information request.

The review refers to "poor methodology" but is lacking in any specific criticism or any particular changes to methodology that could have improved the survey. Then in the third bullet point in **paragraph 22** the reviewers recommend basing the future survey on methods already used. We take that to imply that the main methodological limitations are in regard to the timing and coverage of the survey.

The limitations of the invertebrate survey are acknowledged in the original report. Additional sampling over summer would certainly improve the robustness of findings, although our experts consider it is unlikely that additional survey would substantially change the conclusions as to the value of the area.

More thorough sampling at a wider range of altitudes and in direct association with the vegetation types identified would also improve the robustness of the survey, and may identify rare or new species, but given the nature and spread of habitats in the area, it is considered unreasonable to think that such species would be restricted to zones affected by the proposal and therefore it is not considered that additional survey would change the conclusions in a substantial way.

The reviewer has criticised the level of identification provided. Mitchell Partnerships have provided species level identifications of all those taxa where they considered it was useful to do so, including ground and tree weta, Lepidoptera, and the rare mollusc. For some higher taxa it is impractical to provide species level diagnosis as this would be very time consuming and would not provide any useful information because the group is so poorly known on a national or regional basis that it is impossible to draw useful conclusions. As an example, if we were to discover a new species of parasitic wasp, there is no evidence that it is not widespread within the region. That the reviewers comment that a future survey should concentrate on no more than three groups (and suggest the groups actually used), itself acknowledges the taxonomic impediment inherent to invertebrate surveys.

The reviewers request in **paragraph 22** that the site be resurveyed at a more suitable time of year. Mitchell Partnerships consider that there is little to be gained from additional survey work without going to significant additional expense. The reviewers suggest such a survey should aim to "inform on what special species are present in terms of rarity, threat status, distribution and specialised relationships with the flora or geology". A survey which adequately addresses these matters would be prohibitively expensive, and would require more than a one off survey with a focus on a maximum of three invertebrate groups.

It is not agreed that the surveys are inadequate to form any meaningful opinion on the values present and potential impacts for the following reasons:

1) The habitat available is overwhelmingly natural and intact. The invertebrate fauna is expected to similarly comprise mostly native species. This was confirmed by the (limited) surveys.

2) The Te Kuha area has not been extensively surveyed for invertebrates in the past.

3) There are few taxonomists working in New Zealand and "new" invertebrate species are regularly discovered. For example the number of known, but as yet undescribed, species of leaf-veined slugs now exceeds the 20 or so species which have been described from the New Zealand mainland.

4) Because of reasons 2 and 3 the taxonomy and conservation status of many of the species present would remain unknown, even if they were captured and recorded. Focussing on particular invertebrate groups on the basis of expertise available does not address this matter and would be of limited additional use.

5) The presence of threatened or rare species is likely, given the intact nature of the habitat. Overall, the invertebrate communities found within the project area so not appear to be noticeably different from those encountered in similar habitats within the Ngakawau Ecological Area.

   It is unlikely that the proposed project presents a specific threat to most of the individual invertebrate species present in the project area as similar habitats will remain undisturbed in adjacent areas. Both the '*Rhytida*' and the new *Pseudaneita* species were found in taller woody vegetation which is well-represented outside the project footprint.

The original report recommended an additional field survey specifically targeting the *Pseudaneita* slug and '*Rhytida*' snail to confirm the presence of these species outside the mine footprint and to collect samples for DNA analysis.

23. The weta and cricket species collected during the invertebrate surveys are identified.

The reviewers also request in **paragraph 23** that the weta and cricket species collected during the invertebrate surveys be identified. The specimens were reviewed by a suitable expert (Steve Trewick's group at Massey University who have been leading the way in terms of weta systematics over recent years) and identifications are included in Appendix 3 of the original report.

REHABILITATION

24. Area able to be VDT'd in hectares(even a best estimate would be useful at this stage) and the proportion of the total mine disturbance(eg 18% of total mine is VDT-able, 10% of the haul road vegetation would be VDT'd)

In **paragraph 24**, the reviewers request the area able to be rehabilitated using VDT and what proportion of the total mine disturbance that represents.

As discussed on page 70 of the Mitchell report, the June 2014 mine schedule allows about 18 ha of the mine footprint to be rehabilitated using DT. 18 ha is 17% of the 105.7 ha footprint. The proposed mine schedule also allows DT to be applied across lower slopes of ex-pit overburden landforms and backfill. Nearly all yellow-silver pine-mānuka shrubland vegetation stripped between years two and ten can be recovered and conserved as DT as shown in Tables 11 and 12. The specific timing is discussed in more detail on pages 74 – 79 of that original report.

Similar figures are not available for the proposed access road, because as discussed in Section 7.3.2 of our report, the specific footprint of the road can to some degree, subject to geotechnical considerations, be adjusted according to conservation (vegetation clearance) and landscape priorities. The final road alignment and disturbed footprint is therefore intended be informed by Department of Conservation input. It is expected that many of the 'fill' batters along the access road can be rehabilitated using VDT gathered by "leap frogging" during road construction (i.e. using newly removed vegetation to rehabilitate sections of the road already constructed).

25. Further information on the mining/handling of the ridgeline and construction of final landform, particularly with regard to stability on the eastern face [aligns with landscape requests re: ridgeline]

The reviewers request in **paragraph 25**, further information on the mining/handling of the ridgeline and construction of the final landform, particularly with respect to stability on the eastern face. This matter is best addressed by the mining engineers who are designing the engineered landform.

26. Stockpile availability/planning and soil stockpile scheduling. How Much? And is there room within the proposed footprint?

In terms of extent this matter is considered in Tables 11 and 12 of the original Mitchell report. The mine planning illustrations (including Figures 16 – 18 in our report) include the vegetation and soil stockpile areas and represent a maximum extent. Whilst the mine schedule is likely to change to some degree, the footprint won't be larger, with efforts made to minimise it where possible.

27. Detail on the approach for stream reconstruction/restoration and reinstatement of tarns [aligns with aquatic request]

With regard to the approach to stream reconstruction / restoration and reinstatement of tarns (as requested in **paragraph 27**), the long term ecological objective of the stream reconstructions would be to create a similar amount of stream habitat (stream length and area), quality of stream habitat, water quality and benthic macroinvertebrate and fish community diversity and abundance to that which existed pre-mining. We note that the position and gradient of the newly formed channels is constrained by the topography of the area. Some sections of the new stream channel could have lower stream channel gradient and hence lower water velocity than the existing channels. The new stream channel gradients and reduced water velocity would likely alter the stream bed substrate composition and proportion of habitat types (pools, runs, riffles and chutes). This in turn is likely to alter the biological communities that colonise and live within some of the new sections of stream channel. The gradient of the new stream channels will be suitable for maintaining fish passage.

The new stream channels are not expected to support biological communities that are similar to the existing channels within the life of the mine. One of the key short term (0 – 2 years) objectives of the reconstructions will be to establish and maintain indigenous vegetation in the riparian zone so as to reduce stream bank erosion and sediment inputs and improve water quality. Placement of DT sods will be prioritised for stream riparian zones (including riparian buffers) where these are available to create shade and habitat. In places where nursery seedlings are used, surfacing with rock mulch in flood zones and coarse wood above the flood level will be used to maximise protection of soils from sediment while plants are establishing.

Tarns are generally ephemeral features occurring where water drainage is impeded. They are typically surrounded by a variety of vegetation types, depending on substrate depth, drainage status and site exposure. Tarn-like features have been recreated in places at Stockton including on coal floor, where water flow is impeded by the impermeable coal floor and a bank of overburden is created and then covered with VDT sods, and on flat, compacted overburden. On such areas numerous ponds have been created using mixed soils to block water flow from flat areas. Formation of similar artificially created tarns at Te Kuha during rehabilitation is intended to help ensure the presence of habitat for those species that are limited to these poorly drained areas and contribute to restoring overall habitat diversity at the site once mining is completed. We note that any non-vegetated fine sediment is highly vulnerable to invasion by non-native rushes, particularly *Juncus*

canadensis (at least at Stockton) and monitoring of aquatic and terrestrial components of the biodiversity, as well as attention to weed control at created tarn sites will be required (at least initially).

MITIGATION AND COMPENSATION

<u>Potential ecosystem management proposal</u>

28. FYI only.

MAPS

30. GIS map showing vegetation types overlaid on high resolution aerial photography and separate maps for each of the mine AA footprint, concession road footprint and water reserve footprint.

As requested in paragraph 30 we have provided a GIS map of vegetation types overlaid on high resolution aerial photographs, including separate maps for the access arrangement footprint and concession road footprint (which are the same) and the water reserve footprint. These are provided as Figures 2 and 3 respectively.

We trust this satisfies the request for further information. If you have any questions or queries as you work through this document, please do not hesitate to contact me on 03 445 9905 or 0274 957 486 or via email, kate@btwsouth.co.nz. The residual information, being the AMD information, and the roading information, will be provided under separate cover as soon as it has been received and reviewed by the appropriate personnel.

Yours faithfully

Kate Scott

On behalf of Te Kuha Limited Partnership

Encl.

- *Methodology for photosimulations (drop box)*
- *Graphic Attachment updated from Rough and Milne, August 2014(drop box)*
- *GIS maps (drop box)*
- *Appendix 1 and 2 to accompany Mr I Boothroyd's response (drop box)*