**BEFORE THE TARANAKI REGIONAL COUNCIL AND NEW PLYMOUTH DISTRICT COUNCIL**

**MT MESSENGER BYPASS PROJECT**

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| In the matter | of the Resource Management Act 1991 |
| and | |
| In the matter | of applications for resource consents, and a notice of requirement by the NZ Transport Agency for an alteration to the State Highway 3 designation in the New Plymouth District Plan, to carry out the Mt Messenger Bypass Project |

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# STATEMENT OF REBUTTAL EVIDENCE OF ROGER JOHN MACGIBBON (ECOLOGY MITIGATION AND OFFSETS) ON BEHALF OF THE NZ TRANSPORT AGENCY

30 July 2018

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## INTRODUCTION

1. My name is Roger John MacGibbon.

2. This rebuttal evidence is given in relation to applications for resource consents, and a notice of requirement by the NZ Transport Agency ("the **Transport Agency**") for an alteration to the State Highway 3 designation in the New Plymouth District Plan, to carry out the Mt Messenger Bypass Project ("**the Project**"). It is my third statement of evidence for the Project, following my evidence in chief ("**EIC**") dated 25 May 2018 and my supplementary statement of evidence ("**Supplementary Evidence**") dated 17 July 2018.

3. I have the qualifications and experience set out in my EIC.

4. I repeat the confirmation given in my EIC that I have read the 'Code of Conduct' for expert witnesses and that my evidence has been prepared in compliance with that Code.

5. In this evidence I use the same defined terms as in my EIC and Supplementary Evidence.

## RESPONSE TO EVIDENCE

6. This evidence responds primarily to the evidence of Dr Laurence Barea on behalf of DOC but also to a specific paragraph in the evidence of Dr Rhys Burns and a specific section of Mr Eric Edwards' evidence, both on behalf of DOC. I also respond to some aspects of the evidence of Dr Lee Shapiro filed on behalf of Ngati Tama.

## DR LAURENCE BAREA

7. In Section 2 of his evidence Dr Barea summarises several areas where he disagrees with my evidence, with further and detailed elaboration on each matter in later paragraphs. I address each of these points in sections to follow.

### Offsetting, compensation and no net loss

8. In paragraph 2.1 Dr Barea states that his definition of biodiversity offset and compensation differ from mine. However, his definition of offset, as stated in his paragraph 3.11, is identical to that referred to in my EIC (paragraph 50). The definition used by both of us is extracted directly from the publication "*Guidance on Good Practice Biodiversity Offsetting in New Zealand*" and is derived from the BBOP definition.

9. He later (3.20) provides what appears to be his own definition of compensation: *"Actions offered as a means to address residual adverse effects on the environment arising from project development where no net loss or net gain of biodiversity on the ground is not intended or able to be measured*." Of note, the *Guidance on Good Practice Biodiversity Offsetting in New Zealand* does not provide a definition of compensation.

10. Dr Barea's view that my definition of offset and compensation is not consistent with those used internationally may arise from my attempt to clarify the difference between offset and compensation using layman's terms in paragraph 53 of my EIC. However, in most respects, I suspect that my views and those of Dr Barea on the definition of offset and compensation are essentially the same. While arguments as to terminology may be interesting academically, I do not think this debate has any relevance to assessment of the adequacy of the Restoration Package in addressing the effects of the Project which is the purpose of my evidence.

11. In paragraph 2.2, Dr Barea objects to the use of the term "no net loss" when it is applied to positive environmental effects that cannot be demonstrated, and implies, therefore, that the target of no net loss can only be achieved through biodiversity offsetting and not compensation.

12. He later states (2.3) that what is proposed in this Project is a mixture of offset and environmental compensation. I agree entirely with this statement and have stated so several times in my EIC (including in paragraphs 99 and 100 where I acknowledge that bats, birds, herpetofauna and invertebrates have not been assessed in the offset model because of the limitations of existing survey techniques for bats, herpetofauna and invertebrates and the associated long pre-construction survey periods required for bats, to generate robust quantitative baseline data).

13. Applying Dr Barea's definitions, ecologists would never be able to propose biodiversity offset nor the establishment and achievement of a no net loss outcome for bats, herpetofauna and invertebrates because there is not suitable technology nor is there usually sufficient time to obtain quantifiable data against which a no net loss outcome could be determined. In other words, for these taxa we have no choice other than to pursue a compensation outcome.

14. Where Dr Barea and I may continue to disagree is whether no net loss of biodiversity can only be demonstrated by the generation of empirical before-construction survey data. Equally, I question why a target of no net loss, or determination of an equivalent positive ecological outcome, cannot be pursued by way of compensation as well as by offset. The objective of the Project ecology team has been to develop a Restoration Package that has a high likelihood of generating positive, biologically diverse, and enduring ecological outcomes, greater in terms of net benefit than the residual effects caused by the Project. Most of this package may be more accurately termed compensation but the objective (ecological benefit) remains the same.

15. In the absence of the technology and opportunity to quantify the state of bat, bird, herpetofauna and invertebrate populations I have drawn on the considerable professional experience and expertise of the Project ecologists, who have undertaken physical assessments of the Project area and adjacent

landscape, considered all relevant peer reviewed literature and have applied an additional element of conservatism to their judgements, to demonstrate that a 3650ha PMA managed intensively and in perpetuity has a very high likelihood of generating net positive biodiversity gains 15 years following construction.

16. In paragraph 2.5, Dr Barea states that there is no rigour provided to support how the Applicant's experts (other than Mr Singers) have determined the proposal is sufficient to achieve no net loss. I refer to the rebuttal evidence of each of the Project ecology experts in response to this comment, and highlight the EIC, supplementary evidence and rebuttal evidence of Dr McLennan as an example of the considerable rigour with which determination of an appropriate Restoration Package has been applied.

**Pest management**

17. Both Dr Burns (paragraph 3.9) and Dr Barea (paragraph 4.46) seem to be confused about the intensity with which pests will be managed over the 3650ha PMA, especially with regard to ungulates. To clarify, all pests – goats, pigs, feral cats, mustelids, possums and rats – will be managed equally intensively over the full 3650ha area (as outlined in detail in Section 9 of the ELMP – the Pest Management Plan).

18. Dr Barea acknowledges (paragraph 2.9) that "*on an area basis alone effective management of pests will result in biodiversity gain significantly greater than previously proposed.*"

19. In paragraph 2.9 b) Dr Barea expresses concern about appropriate sized pest management buffers and how they will reduce the effective size of the PMA where all the benefits of pest control will occur. Pest intrusion from areas of little or no pest management into areas of perpetual intensive pest management is a practical reality irrespective of how large or small the pest management area is. The buffers referred to in the ELMP and my supplementary evidence reflect the potential area that will experience occasional penetration of pests. Pest densities in the buffer zones can be expected to be above the performance targets on occasions but they will not rise to densities found in unmanaged areas and as a consequence there will still be considerable benefits to biodiversity in these buffer areas.

20. I acknowledge that, currently, the ELMP does not adequately emphasise the need for more intensive edge pest management. In recognition of the importance of pest management around the PMA margins it is proposed that additional pest management effort (increased trap/bait station intensity) will be directed at rat and stoat control along PMA boundaries particularly in areas where sizeable pest populations are suspected to exist on adjacent unmanaged land, and especially in the period immediately leading up to the bat and bird breeding season. Details to this effect will be added to the ELMP.

21. With the exception of reference to bats, where he defers to the evidence of Dr O'Donnell, Dr Barea does not propose a different sized PMA. In my opinion, which is reinforced by Mr Singers in his supplementary and rebuttal evidence, the core areas of the PMA (ie. those areas lying inside the buffers) are more than sufficient to generate positive biodiversity gains.

22. While I refer to the rebuttal evidence of Mr Chapman for comment on the value of the enlarged 3650ha PMA for bats, I note that the rat management areas in the Fiordland study carried out by O'Donnell et al[1] also appears to include margins where rats are likely to have intruded. That study extrapolated that bat population recovery was detectable in rat managed areas of 3350ha or larger so there is good reason to expect a similar response in the proposed 3650ha PMA.

23. Mr Chapman notes in his rebuttal evidence (paragraph 12) that long tailed bats generally use cavity-bearing trees >80 cm DBH for roosting and breeding when available. I recently undertook a sample survey of tree stem diameters along the Project footprint. An area of 2.83 hectares was surveyed along the footprint with sample sites in both the Mangapepeke and Mimi catchments. In total, 61 trees greater than 80cm DBH were recorded. While the sample area was relatively small I consider it was representative of the forest types and tree dimensions that are likely to be found along the full footprint, and also likely to be indicative of tree dimensions over the entire 3650ha PMA. This would suggest that there are several tens of thousands of trees in the PMA that have stem diameters greater than 80cm and therefore could be suitable bat roost trees.

24. I reiterate the point made by Mr Chapman in his evidence (paragraph 55 of his EIC) that achieving anything beyond addressing any residual effects the Project will have on bats should be considered a bonus and a benefit of the Project. Halting and / or reversing the existing decline in the local bat population should be seen as a benefit of the Project for bats.

**Herpetofauna**

25. Dr Barea agrees (in paragraph 4.7) with Ms Adams' opinion that adverse effects to lizards will be satisfactorily addressed by the construction of a predator proof fence around an area with a known lizard population. This is consistent with what is proposed as part of the Restoration Package. A potentially suitable site for the enclosure and a willing landowner have been identified approximately 20km northeast of the Project site. Discussions with that landowner are ongoing.

[1] O'Donnell, C., Pryde, M., Dam-Bates, P. and Elliot, G. 2017. Controlling invasive predators enhances the long-term survival of endangered New Zealand long-tailed bats (*Chalinolobus tuberculatus*): Implications for conservation of bats on oceanic islands. Department of Conservation 156-167.

**Freshwater values**

26. In paragraph 4.80 Dr Barea provides his support for Dr Drinan's view that the SEV should be redone and that confirmation of agreement with private landowners where planting is required on their property needs to be provided for certainty. I refer to Mr Hamill's rebuttal evidence in response to matters related to the SEV, but confirm that the agreement of private landowners has been obtained for all but 2.3km of the stream margins required for riparian restoration works and written documentation to that effect is currently being developed with those landowners. Suitable stream sections, adjoining the confirmed sections, have been identified to make up the full 8.455km required and discussions are on-going with those landowners.

**Restoration Planting Additional Works Area**

27. Dr Barea states (paragraph 4.71) that he does not support a 1:1 ratio for the 8.38ha of proposed mitigation planting (or a lower one such as that proposed 0.5:1 for replacement of exotic rushland) because it does not account for time lags and assumes 100% success. He adds that if a 1:1 ratio is adopted, then anything less than 100% success results in a net loss.

28. As a point of correction, the area of proposed mitigation planting has been increased to 9ha as stated in my supplementary evidence.

29. As stated in my EIC (paragraph 172) I believe 1:1 mitigation planting is appropriate for the following reasons:

    (a) The vegetation being replaced is early successional manuka-dominant scrub and the mitigation planting is likely to reach a similar size and ecological equivalency within 10 years of planting.

    (b) The enlarged PMA and the intensive pest management that will be undertaken within it contains a number of grass valleys that are currently grazed by ungulates including farm livestock. Removal of ungulates will promote considerable manuka dominant regeneration along the bush edges adding to the areas of new early successional vegetation.

    (c) The Restoration Package includes provisions to ensure that all 9ha of mitigation planting are fully and successfully established. Continued maintenance and blanking will occur until the required 80% canopy cover is achieved - an acceptable measure of planting success.

**Other vegetation and values**

30. The matter of whether species-appropriate sites for the planting of the 3400 significant tree seedlings have been confirmed is raised in paragraph 4.83 of Dr Barea's evidence. Suitable sites for all of the seedlings have been found along the designation and on Ngāti Tama land adjacent to the Project site.

**Adoption of current ELMP in conditions**

31. In paragraph 4.87 of his evidence Dr Barea expresses concerns about several aspects of the content of the ELMP and the suitability of those aspects to be adopted as consent conditions. I comment on each of these below.

32. Paragraphs 4.87 a) and b) relate to long tailed bats and I refer to Mr Chapman's rebuttal evidence in response.

33. Paragraph 4.87 c): Dr Barea states that the ELMP contains provisions for a biodiversity offset that cannot demonstrate no net loss now or in the predicted 10-15 years, and comments that the ELMP needs to be revised to remove reference to the offset and no net loss for EI and instead focus on biodiversity gain under an environmental compensation framework. I refer to the rebuttal evidence of Mr Singers for a more detailed response on whether his use of EI is an appropriate method for determining vegetation offset. However, in my opinion Mr Singers' use of EI as the currency for vegetation offset is appropriate and consequently the offset area he has determined is, by definition, legitimately biodiversity offset.

34. As I have commented in paragraphs above, the contents of the Restoration Package other than the vegetation offset area calculated by Mr Singers are, by definition, compensation and at no point have I claimed otherwise. However, the primary objective of the Project Ecology team has always been to propose a Restoration Package that will generate net biodiversity gains after construction of the road. I consider that the Restoration Package as presented will achieve these positive outcomes, and the evidence of the Project ecologists demonstrates that the predicted outcomes have a high likelihood of being achieved. A different "environmental compensation framework" (as Dr Barea describes) is not necessary to achieve these outcomes.

35. Paragraph 4.87 d): Dr Barea states that the vegetation outcome monitoring, as detailed in the ELMP, lacks design and operational detail and methodological certainty. I agree that currently there is insufficient detail in the ELMP about the methods to be used for vegetation outcome monitoring. Additional detail will be added before pre-construction survey work needs to be undertaken. This information will include detailed survey methodology including the size of sample plots or lines, the number of sample sites, the regularity of sampling, and the measurements to be recorded. For the canopy health monitoring, the methodology for drone imagery assessment will be defined.

36. Paragraph 4.87 e) and f): Dr Barea states: *"The ELMP needs to provide for an Ecology Review Panel with function beyond pest management (e.g. fauna outcome monitoring), rather than the narrow (proposed) Pest Management Review Panel. The function of the Panel should also include reviewing a revised ELMP and ecological reports provided to Council and making*

*recommendations to Council based on those reviews."* I agree with Dr Barea's comments. A single Ecology Review Panel was originally proposed (see paragraph 177 in my EIC) but subsequent to that it was considered that the skills required to review the pest management programme and those required to review the aquatic, botanical, avian and herpetological monitoring data were very different and would require experts in each rather than a single panel of generalists. In the process of creating a specialist Pest Management Panel reference to having a panel for the ecological outcome monitoring tasks was inadvertently dropped.

37. To better address the need for independent review capacity across all of the pest management and ecological monitoring areas it is proposed that the name of the Panel be changed back to an "Ecological Review Panel". This panel will be comprised of a single representative from each of DOC, Ngati Tama and the Requiring Authority, each preferably having pest management and broad ecological skills, plus a single recognised independent expert in each of the specialist areas that will be monitored post construction: pest management, aquatic ecology, botany, avian ecology and herpetology. The independent panel experts will have the role of providing independent review of monitoring and performance data as required and will report their findings and recommendation to the consenting authorities and to the stakeholder representatives on the Panel. A draft consent condition that reflects the nature and functions of the Ecological Review Panel is presented by Mr Roan.

38. Paragraph 4.87 g): The issue of obtaining landowner approval for planting and fencing activities is addressed in paragraph 25 above.

39. In paragraph 4.87 h) Dr Barea states that "*Provisions for monitoring the performance of pest control are inadequate to inform adaptive management*". It is intended that the pest management performance monitoring programme will reflect best practice with the details of the monitoring programme to be refined in consultation with the Ecological Review Panel and the independent pest management expert on that panel.

40. Paragraph 4.87 i): Details of the fence design and management of the lizard enclosure are contained in Section 7.4.7 of the ELMP. Further site specific management details will be added to the ELMP once formal agreement with the landowner has occurred prior to commencement of construction.

41. I refer to the rebuttal evidence of Dr McLennan with regard to Dr Barea's concerns (his paragraph 4.87 j) about bittern monitoring (paragraphs 25-27). He also suggests that provision should be made for the monitoring of kōkako should they move into the construction area which Dr McLennan addresses in his EIC at paragraphs 112-113 and 125).

42. My response to Dr Barea's point in paragraph 4.87 k) is above at paragraph 29.

43. Dr Barea refers to an "*absence of a hydrological assessment of the Mangapepeke floodplain affected by fill, wetland function of that floodplain, and the potential for hydrological impacts due to constrained flood flows"* (paragraph 4.87 l). I refer to the evidence of Mr Boam EIC (at paragraphs 199-204) in response to this.

44. In paragraph 4.87 m) Dr Barea expresses concern about the lack of adequate biosecurity provisions around restoration planting, and refers to the evidence of Mr Edwards. My response to Mr Edwards' evidence is below.

**MR ERIC EDWARDS**

45. I respond to sections 4 and 6 of Mr Edwards' evidence on invertebrates. While I am not an expert entomologist I do have considerable experience in native plant production for revegetation purposes having managed what was New Zealand's largest specialist native plant revegetation nursery, the Taupo Native Plant Nursery, for 7 years firstly for DOC and then for a private consortium. Subsequently I have designed native plant production nurseries for a number of entities in the North Island. I have also worked with the Ministry of Primary Industries on disease and invertebrate biosecurity planning and operational activities, most recently assisting with the Queensland fruit fly outbreak in Auckland.

46. I am very familiar with nursery production systems and the biosecurity risks that nurseries can pose when supplying native plants to natural areas. The importance of effective management of invertebrates and micro-organisms during plant production is even more pronounced now as we struggle to contain diseases such as Myrtle Rust and Kauri Die-back Disease.

47. I concur with the comments made by Mr Edwards made in paragraphs 4.1 to 4.7 and agree that the ELMP currently does not adequately address the management of invertebrate biosecurity risks, especially those associated with the importation of nursery raised plants to the Project site.

48. Mr Edwards proposes a series of conditions in paragraphs 6.1 to 6.5 of his evidence with emphasis (6.1 to 6.3) on invertebrate inspections of plant material at the supply nurseries prior to delivery to the Project site. I support the measures proposed and recommend that they are added to (and I will redraft) the Biosecurity Management Plan section (Section 11) of the ELMP.

49. In paragraphs 6.4 and 6.5, Mr Edwards proposes before construction and after planting surveys of the Project site for invertebrate pests by a suitably qualified entomologist. I agree with this approach as it will serve to determine what if any pest species are present before construction commences and therefore allow biosecurity efforts to focus on those high risk pests that are not present.

**DR LEE SHAPIRO**

50. Dr Shapiro has been engaged by Ngāti Tama to review the proposed pest control measures as well as the pest and biodiversity monitoring proposed for the Restoration Package within the PMA. His evidence addresses the pest management components of the Restoration Package and I respond to issues raised in his evidence about the Package.

51. In paragraph 20 of his evidence Dr Shapiro states: *"The success of the Kokako Restoration Project in the Parininihi illustrates how effective Ngati Tama have been at undertaking a large-scale restoration project in this area".* He goes on to say (paragraph 21): "*In my opinion, the involvement of Ngati Tama with the development and implementation of the pest control mitigation is vital to its potential success given their unique understanding of the terrain and effective control methodologies for this area, as well as their natural intergenerational association with this area*."

52. The success of the Kōkako Restoration Project, and the successful pest management methods used to achieve pest densities that have enabled kōkako to be successfully introduced, is the basis of my confidence that the proposed pest management programme for the Project will be successful and the anticipated positive ecological outcomes will eventuate. Ngāti Tama's local experience in pest management has been, and will continue to be, important in implementing the Pest Management Plan, including through their appointment on the Ecological Review Panel.

53. In paragraphs 25 and 26, Dr Shapiro questions why the western satellite blocks of land (owned by Ngāti Tama) have been included in the PMA rather than the larger, more connected Parininihi. From the perspective of connectedness and possibly also ecological equivalence I agree that the Parininihi would be a more suitable area to include in the PMA. However, because the Parininihi is already being managed intensively for pests by Ngāti Tama (supported by external funding and DOC logistical support) the inclusion of the Parininihi would not meet the requirement for additionality.

54. However, both Dr Barea (at paragraph 4.87(a)) and Mr Inger (at paragraph 7.12) question the certainty of ongoing pest management (at least at the present levels) in Parininihi. It appears from these comments that DOC is reviewing its ongoing support for pest control in this area. As kōkako were only released there last year, and they appear to be successfully breeding, a reduction in pest management effort in the area would be unfortunate. If DOC reduces or removes its support for appropriate pest management in Parininihi its inclusion in the PMA would meet the requirement for additionality (and the equivalent area of DOC land would be removed from the PMA).

55. While the western satellite blocks are not physically connected to the main body of the PMA they are connected to the Parininihi block. Both areas will benefit from intensive pest management applied to the satellite blocks.

56. In paragraphs 27 to 32 Dr Shapiro makes several comments about the relative merits of a variety of trap types and states that he would not recommend the use of A24 Goodnature traps as the only trap used for rat control. I have found that experienced pest management experts (including those within DOC) have quite varying views about the effectiveness of A24 traps. There are projects where they have been very effective and others where they have been less so, as Dr Shapiro points out. However, I agree that the pest management programme should commence with a strategy that draws on the Ngāti Tama experience and does not rely entirely on one method or trap type for each pest.

57. It is for this reason that I have proposed that an Ecological Review Panel be set up for the Project (which includes pest management experts), and that Ngāti Tama, with their relevant local experience have an appointee on that panel. This group of experts will have the role of reviewing the monitoring results and applying an adaptive management approach to pest management if any method is not achieving the desired results.

58. In paragraphs 33-38 Dr Shapiro discusses the proposed frequency and duration of pest density monitoring. He proposes four times per year monitoring for the first 12 years of the pest management programme. While Dr Shapiro describes four times per year monitoring as best practice I consider that in a pest management area as large as is proposed three times per year monitoring spread out over the full PMA will generate sufficient pest density information on which to gauge the effectiveness of the campaign and make adjustments to the methods used.

59. I also do not consider that the three times per year monitoring should need to continue for as long as 12 years. I consider that after 5 years, assuming pest density targets are being achieved, sufficient knowledge of pest population changes under different environmental conditions will have been gained to enable the pest management team to modify their methods in response to one pre-breeding season set of monitoring data. The ELMP requires that the monitoring must revert back to 3 times per year when performance targets are not met in two consecutive years.

60. Dr Shapiro suggests that the ELMP does not require monitoring of mustelids and rats immediately before and after the proposed three-yearly aerial 1080 operations. This is not correct. The monitoring regime will be the same whether it is a 1080 application year or not.

61. In paragraphs 40 and 41 Dr Shapiro suggests that mice densities should also be monitored in anticipation that at some time in the future more effective

mouse control techniques may be developed. I agree that mouse densities should be monitored and this can be done using the same tracking tunnel methods used for rats.

62. Dr Shapiro suggests that I recommend (in paragraph 25 of my Supplementary Evidence) that pest monitoring should not be undertaken in the buffer zones of the PMA, and goes on to say he does not agree with this. However, I do not state that monitoring should not take place in the buffer areas. Rather I recommend that the monitoring results derived from monitoring of the whole PMA should not be used when calculating the average pest density for each species. In other words, the determination of whether target pest densities have been met should be derived from pest density data that does not include the buffer areas. I accept that the wording of this may not be as clear as it could be in my supplementary evidence and will ensure that it is expressed more clearly in the ELMP.

63. Explanation is requested for the area labelled “Possible Ungulate Control Area” in the PMA map shown in Appendix F of the ELMP (and also contained in my supplementary evidence). This area is a privately owned block of bush under QEII covenant, and is not currently included in the 3650ha PMA. Its addition to the pest managed area would improve the ability to keep mobile pests, especially goats, pigs and stoats, from reaching the core areas. Engagement with this landowner is intended.

64. In paragraphs 49 and 50, Dr Shapiro asks why the avian outcome monitoring surveys are only to be undertaken within the original 230ha core section of the PMA. I understand from Dr McLennan that this is not the case; the bird surveys will be undertaken over the full 3650ha PMA. The reference to 230ha in the ELMP is an error (not updated) and will be corrected.

**CONCLUSION**

65. Having read and responded to the evidence of Dr Barea, Dr Burns and Mr Edwards I have no reason to change any of my previous conclusions. I remain of the opinion that the Restoration Package, as currently proposed, will provide substantial biodiversity gains by year 15, well in excess of the effects caused by the Project. Therefore, the Restoration Package appropriately addresses the ecological effects of the Project and will provide substantial biodiversity gains in perpetuity.

**Roger MacGibbon**

**30 July 2018**