

Before a Board of Inquiry
Transmission Gully
Notices of Requirement and Consents

under: the Resource Management Act 1991

in the matter of: Notices of requirement for designations and resource consent applications by the NZ Transport Agency, Porirua City Council and Transpower New Zealand Limited for the Transmission Gully Proposal

between: **NZ Transport Agency**
Requiring Authority and Applicant

and: **Porirua City Council**
Local Authority and Applicant

and: **Transpower New Zealand Limited**
Applicant

Statement of rebuttal evidence of Dr Leigh Sandra Bull (Avifauna) for the NZ Transport Agency and Porirua City Council

Dated: 20 January 2012

REFERENCE: John Hassan (john.hassan@chapmantripp.com)
Nicky McIndoe (nicky.mcindoe@chapmantripp.com)

Chapman Tripp
T: +64 4 499 5999
F: +64 4 472 7111

10 Customhouse Quay
PO Box 993, Wellington 6140
New Zealand

www.chapmantripp.com
Auckland, Wellington,
Christchurch



STATEMENT OF REBUTTAL EVIDENCE OF DR LEIGH SANDRA BULL FOR THE NZ TRANSPORT AGENCY AND PORIRUA CITY COUNCIL

INTRODUCTION

- 1 My full name is Leigh Sandra Bull.
- 2 I am an Associate Principal and Senior Ecologist with Boffa Miskell Limited (*BML*). I have worked as an ecologist for 9 years. My area of specialisation is ornithology, particularly seabirds and coastal avifauna.
- 3 I hold the qualifications of Bachelor of Science (Zoology), Masters of Science with Honours (Ecology) and PhD (Ecology) from Victoria University of Wellington. I am a Certified Environmental Practitioner with the Environment Institute of Australia and New Zealand and am bound by the Institute's code of ethics.
- 4 After completing my PhD in 2003 I worked for the Department of Conservation in the Biodiversity Recovery Unit as a Species Protection Officer and later as a Senior Technical Support Officer in the Marine Conservation Unit. Though now disbanded, the Biodiversity Recovery Unit was a national unit that focused solely on the recovery of New Zealand's threatened species. In 2005 I was awarded a French Ministry of Research post-doctorate fellowship at the Université Paris Sud XI. After completing my post-doctorate, I contracted to NIWA to undertake seabird field investigations on Antipodes Island.
- 5 I joined Boffa Miskell in 2007, and have since worked on a variety of projects investigating the potential impact of developments on avifauna, including coastal species.
- 6 I have significant experience conducting ecological surveys and monitoring of a variety of fauna in New Zealand, New Caledonia, Tonga and France. These skills combined with a comprehensive understanding of ecological principals provide me with a thorough knowledge regarding species habitat requirements and how they can be managed effectively in different environments.
- 7 To date I have authored more than 20 international and national peer-reviewed scientific publications and numerous technical reports relating to a variety of ecological matters.
- 8 I have appeared as an expert witness before council hearings and at the environment court in relation to consent applications for landfill and Council Plan changes in terrestrial and coastal environments.

- 9 My professional memberships include:
- 9.1 The Environment Institute of Australia and New Zealand; and
- 9.2 The New Zealand Ornithological Society.
- 10 I have read, and agree to comply with, the Code of Conduct for Expert Witnesses (Consolidated Practice Note 2011).
- 11 I confirm that I am authorised to give this evidence on behalf of the NZ Transport Agency (the NZTA) Project and the Porirua City Council (PCC).
- 12 I am familiar with the area that the Project covers including, in particular the Porirua harbour, and the State highway and local roading network in the vicinity of the Project. I undertook the avifauna investigations for the Project and am the author of Technical Report #8, Avifauna & Bats: Description and Values report.
- 13 I note that I did not attend the expert caucusing for Terrestrial Ecology on 8th and 16th December 2011, but have read the agreed statement and discussed the issues raised with Mr Fuller.
- 14 For the purposes of this evidence, I will refer to the NZ Transport Agency (the NZTA) Project¹ and the Porirua City Council (PCC) Project² collectively as the "Transmission Gully Project" (and hereafter, the TGP or the Project).

EXECUTIVE SUMMARY

- 15 In this statement of rebuttal evidence I will respond to the evidence in chief (EIC) of Dr Matthew James Baber, on behalf of the Director General of Conservation.
- 16 A key concern of Dr Baber's is that the ecological assessment for the Project does not provide sufficient information on coastal birds which are reliant on habitat within Porirua Harbour. He therefore concludes that he cannot determine the potential adverse effect of sediment discharge to this harbour on foraging of these species.
- 17 Consequently, Dr Baber recommends (at paragraphs 26a and 86b of his evidence) conducting coastal bird surveys to provide baseline data against which the effects of sedimentation on these birds can be assessed and adaptively managed.

¹ The 'NZTA Project' refers to the construction, operation and maintenance of the Main Alignment and the Kenepuru Link Road by the NZTA.

² The 'PCC Project' refers to the construction, operation and maintenance of the Porirua Link Roads (being the Whitby Link Road and the Waitangirua Link Road) by PCC.

- 18 The avifauna data presented by Dr Baber in his EIC, on which he bases some of his concerns, has been derived from the Ornithological Society of New Zealand Pauatahanui Inlet surveys conducted in two-year blocks since 1982 (i.e. 1982-84, 1992-94, 2002-04).
- 19 In the following sections I will respond to Dr Baber's concerns and highlight:
- 19.1 that the number and diversity of birds within the harbour is not high relative to other sites within the region or nationally;
 - 19.2 that the number of species potentially affected by sediment discharge from the Project is very low; and
 - 19.3 that the area of intertidal habitat potentially affected by additional discharge from the Project is small.
- 20 On this basis, I confirm my belief than any potential effects of sedimentation from the Project on coastal birds will be negligible.
- 21 With regard to monitoring, I note that:
- 21.1 the significant existing sediment deposition from other land use activities will make determination of cumulative effects on coastal bird species from the Project problematic; and
 - 21.2 the low number of individual birds will make any statistical analysis of population or foraging changes difficult.
- 22 If there is to be a requirement to attempt to assess potential effects on coastal avifauna, my recommendation is that this be through, as was originally intended, the monitoring of significant changes in the marine invertebrates on which the wading bird species forage.

CONTEXT

- 23 There was agreement amongst all parties attending the ecological conferencing on the significance of Porirua Harbour both in terms of the ecological services it provides, and the habitat and species that occur there. I concur with the matters agreed on in this regard.
- 24 I believe there is also general agreement amongst stakeholders that the ecological values of the harbour have been compromised to varying degrees over the past 150 years, hence the preparation of the Porirua Harbour and Catchment Strategy and Action Plan³ and the formation of the Porirua Harbour Catchment Community Trust (PHACCT).

³ PCC (2011). Draft Porirua Harbour and Catchment Strategy and Action Plan. Prepared by Porirua City Council, August 2011.

- 25 It is my view that one of the ecological values that has been most affected is that of the avifauna associated with the harbour.
- 26 There is no reason to believe that prior to human occupation, a harbour of the size and diversity of Porirua Harbour was not home to a great diversity and abundance of divers, dabblers, waders and shorebirds that fed on the beaches, mudflats, shell beds, marine plants and tidal saltmarsh.
- 27 Today this is not the case, with many birds that one would expect to be resident in high numbers, either absent, occasional visitors or resident in low numbers. This is reflected in the list of species and their relative abundances provided in Appendix 1 of Dr Baber's EIC (based on data collected by the Ornithological Society of New Zealand at Pauatahanui Inlet, 1982-2004).
- 28 The reasons for this are likely to be varied and interrelated. From my experience as an ecologist in the Wellington region, and from my observation of the Inlet and surrounding land uses, those reasons will include:
- 28.1 Development of road and rail which 'hard edged' a significant proportion of the harbours circumference, reclaiming beaches, embayment's, and saltmarsh and replacing them with rip rap banks.
 - 28.2 The loss of high tide roosts, most likely on the beaches and dunes lost to reclamation during the development of Mana.
 - 28.3 Loss of the dune and beach system which now lies beneath the playing fields of Ngatittoa Domain and Mana.
 - 28.4 Loss of adjacent forest margins, including overhanging trees which would have provided roost and nest sites to shags and herons.
 - 28.5 Severance from and drainage of the saltmarshes and wetlands that would have occurred in the lower Horokiri and Kakaho valleys.
 - 28.6 Urbanisation of the catchments and harbour edges, resulting in:
 - (a) Predators and domestic pets and their impact on breeding;
 - (b) Recreational use of the beaches including dog walking;
 - (c) Recreational use of the harbours including boating, jet skis, boat races;

- (d) The effects of pollution from marinas, boat de-fouling products, rural fertilisers, weeds and pest control, and urban stormwater; and
 - (e) Increased sedimentation due to run-off associated with the residential developments in the catchment.
- 29 Of these, I believe the lack of high tide roosts and high public activity around the margins of these estuaries will be key limiting factors for most waders and shorebirds including migrants. The lack of appropriate and safe breeding habitat will limit resident bird populations.
- 30 The relative paucity of avifauna within the Porirua Harbour is evident in a number of publications (e.g. Sagar *et al.* 1999⁴, Southey 2009⁵). Of particular note is that the Porirua Harbour does not rank among the 19 sites listed by Dowding & Moore (2006)⁶ as the most important sites in New Zealand for national and internationally migrant species. The five key regions listed by these authors were:
- 30.1 The east coast beaches and smaller estuaries of Northland, Auckland, Coromandel Peninsula and Bay of Plenty.
 - 30.2 The large, northern harbours (particularly Kaipara, Manukau and Firth of Thames but also Parengarenga, Whangarei and Kawhia).
 - 30.3 The estuaries of the northern coast of the South Island (particularly Farewell Spit and Tasman Bay).
 - 30.4 The estuaries, lagoons and rivermouths of the east coast of the South Island (particularly those between Ashley Estuary and Waitaki River).
 - 30.5 The large braided riverbeds and surrounding areas in inland regions of the central South Island.

⁴ Sagar, P.M.; Shankar, U.; Brown, S. (1999). Distribution and numbers of waders in New Zealand, 1983-1994. *Notornis* 46: 1-43.

⁵ Southey, I. (2009). Numbers of waders in New Zealand 1994-2003. *DOC Research & Development Series 308*. Department of Conservation, Wellington. 70 p.

⁶ Dowding, J.E.; Moore, S.J. (2006). Habitat networks of indigenous shorebirds in New Zealand. *Science for Conservation* 261. 99 p.

- 31 Though most of the sites identified by Dowding & Moore (2006) are considerably larger than the Porirua Harbour (807 ha), the Avon-Heathcote Estuary is comparative in size (880 ha⁷) and has been identified by these authors as a site of national importance.

FORAGING HABITAT

- 32 While the Porirua Harbour is a reasonable size (807 ha⁸) the large subtidal component (65% of the estuary under water at low tide⁸) limits the amount of foraging habitat available for wading species. In paragraph 40 of her EIC, Dr De Luca notes that the ratio of subtidal to intertidal habitat in the Porirua Harbour is high compared to other estuaries and tidal inlets. Stevens & Robertson (2008)⁸ attribute this subtidal dominance of the estuary in part due to the extensive historical loss of upper intertidal estuary flats and saltmarsh through reclamation.
- 33 Dr De Luca used the outputs of the hydrodynamic modelling undertaken by SKM⁹ to determine the effects of construction phase stormwater on the Porirua Harbour. Modelling of the baseline scenario (in the absence of the Project) confirmed that sediment deposition will occur in the intertidal, shallow subtidal and subtidal areas in varying proportions depending on the size of a rainfall event and associated predominant wind (refer to Appendix B Figures 15A-22 of Dr De Luca's rebuttal evidence).
- 34 Of the modelled scenarios for the potential contribution from the Project, Dr De Luca noted (paragraph 16-19 EIC) that all but two events¹⁰ were considered to have negligible or low adverse effects on marine ecological values; primarily as sediment was either minimal or largely confined to parts of the harbour with low ecological values.
- 35 Furthermore, the modelling predicted small, localised areas of additional deposition, above baseline, in the two storms¹⁰ that Dr De Luca assessed to most likely result in significant adverse effects (paragraph 19, EIC). From this, Dr De Luca concludes that the adverse effects related to the Project, if the events identified

⁷ Cromarty, P.; Scott, D.A. (1996). A Directory of Wetlands in New Zealand. New Zealand Department of Conservation. 395 p.

⁸ Stevens, L.; Robertson, B. (2008). Porirua Harbour Broad Scale Habitat Mapping 2007/08. Prepared by Wriggle Ltd for Greater Wellington Regional Council and Porirua City Council. 29 p.

⁹ Evidence of Ms Malcom and Mr Roberts and Technical Report 15.

¹⁰ (1) 10 year rainfall event in the Kenepuru/Porirua catchments, with a 2 year rainfall event elsewhere in the harbour, occurring with strong persistent southerly winds; (2) 10 year rainfall event in the Duck/Pauatahanui catchments, with a 2 year rainfall event elsewhere in the harbour, occurring with strong persistent northerly winds.

occur, are likely to be small in comparison to baseline and that the habitat that may be affected is likely to naturally recover over time.

- 36 The areas of harbour predicted to receive the most sediment deposition are subtidal areas (i.e. permanent water). These are not used by waders or shorebirds.

RESPONSE TO DR BABER'S COMMENTS

Analysis of Coastal Bird Values

- 37 In his EIC (paragraph 34), Dr Baber notes that 35 species of coastal birds have been recorded in the Pauatahanui Inlet by the OSNZ (1982-2004). This information is based on the data originally presented in the OSNZ's submission¹¹ on the Draft Porirua Harbour and Catchment Strategy and Action Plan. However, the list of 32 species provided in Appendix 1 of Dr Baber's evidence differs slightly from the 35 species listed in the OSNZ submission. The most notable difference in Dr Baber's list is the omission of five species (none of which had Threatened or At Risk classifications), the inclusion of one Threatened species (NZ shore plover) not originally listed, and the arbitrary determination of what constitutes "High" (>40 individuals) and "Low" (<40) counts.
- 38 No rationale is given by Dr Baber for the cut-off of 40 counts used to differentiate between "High" and "Low". Furthermore, it should be noted that the count data he presents are cumulative totals based on data collected one day per month over a two year period (2002-04). Thus, the "High" count of approximately 70 banded dotterel should not be viewed as a population estimate as it may include multiple counts of single individuals over the two year period. A "High" count may in fact be indicative of a low number of birds being recorded regularly within the harbour, rather than a high number of individual birds.
- 39 I disagree with Dr Baber's allocation of a "High" status to species for which a cumulative count of data collected one day a month over a two year period, totals 40 or more. Nevertheless, for consistency I have used Dr Baber's count status throughout the remainder of my evidence.
- 40 The list of species presented by Dr Baber (EIC Appendix 1) includes 20 species which are classified as Threatened or At Risk. He states that of those Threatened or At Risk species, "High" counts (>40) were recorded for banded dotterel, Caspian tern, red-billed gull, pied stilt, pied oystercatcher, white-fronted tern, variable oystercatcher, black shag, little black shag and royal spoon bill. The remainder of the species were recorded in "Low" (<40) numbers over a two year period (2002-04).

¹¹ Annex 1 and Annex 2 of OSNZ submission dated 29 September 2011.

- 41 There is no doubt that a moderate diversity of species has been recorded in the inlet between 1982-2004. The only species of concern for present purposes, however, are those species that could be adversely affected by the loss of foraging habitat as a result of sediment deposition, which is a considerably reduced list. For instance, tern, gull and shag species forage largely on fish species, not invertebrates, and will not be affected by the Project.
- 42 Focussed solely on waders and dabblers (those species more reliant on invertebrates), the number of species on the list reduces significantly from the 32 species listed in Dr Baber's EIC (Appendix 1) to 17. If species that are recent colonisers (e.g. black swan, royal spoonbill), Not Threatened or recorded in "Low" numbers are excluded, the number reduces further to just three species: banded dotterel, pied stilt and variable oystercatcher.
- 43 Thus, based on the list of species recorded in the inlet between 1982-2004 (listed in Appendix 1 of Dr Baber's EIC), the only Threatened or At Risk species for which "High" counts were recorded and which may be reliant on foraging habitat that could potentially be affected by any sediment discharge are banded dotterel, pied stilt and variable oystercatcher. I note the Dowding & Moore (2006) list of the important breeding and non-breeding sites for these three species does not include Porirua Harbour. Furthermore, the Porirua Harbour did not feature as an important site for any other indigenous shorebirds in that publication.
- 44 Thus, with regard to Dr Baber's concern that there has been no study to quantify coastal bird values as part of the Project, I note that the OSNZ data indicate there are three Threatened or At Risk species for which he has assigned the status of a "High" count (< 40 individuals between 2002-04), which may be reliant on foraging habitat that could potentially be affected by any sediment discharge. However, the Porirua Harbour is not identified as providing either important breeding or non-breeding habitat to these three species (Dowding & Moore 2006).
- 45 In addition, as stated earlier, the hydrodynamic modelling predicted small, localised areas of additional deposition, above baseline, in the two storms that Dr De Luca assessed to most likely result in significant adverse effects (paragraph 19, EIC). The areas of harbour predicted to receive the most sediment deposition are subtidal areas (i.e. permanent water). These are not used by waders or shorebirds (such as the three species identified).

Coastal Bird Survey

- 46 In Dr Baber's EIC, he recommends (paragraphs 26a and 86b) that a coastal bird survey be conducted to establish a baseline for the pattern of foraging habitat use.

- 47 However, Dr Baber also acknowledges (paragraph 35 EIC) that, in the context of recent changes to the harbour through the effects of subdivision within the catchment, the relative abundance and spatial distribution of areas of **high value** to coastal birds may have changed accordingly. I concur with this statement but would add the further comment that the mobile nature of these birds means that they are able to move from area to area in response to changes in habitat quality and extent.
- 48 The implication this has on the collection of the suggested baseline data is that the ongoing land use activities that discharge sediment into the inlet will likely result in continued spatial variability of habitat use. This would make it difficult to establish a meaningful baseline pattern of foraging habitat use against which the potential impact of sediment discharge associated with the Project can be assessed.
- 49 Given bird mobility, the current high levels of sediment discharge from other land uses and the relatively low predicted sediment from the Project; it would be difficult to attribute effects on bird habitat use to the Project.

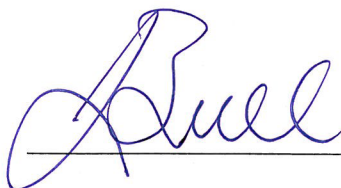
OTHER MATTERS

- 50 I note that Technical Report #8 (Avifauna & Bats: Description and Values report) went through a pre-lodgement review process by Golder Associates for both the RATAG and EPA (Completeness Check).
- 51 In the initial review for RATAG, Golder Associates identified the need for further referencing and information on the avifauna species utilising the Pauatahanui Inlet. Following these review comments, revisions were made to Technical Report #8 to address this and in particular to better explain the rationale for the methodology used (i.e. without specific bird surveys).
- 52 The subsequent Completeness Check undertaken by Golder Associates of the Ecology Technical Reports for the Project did not raise any further issues or comments regarding Pauatahanui Inlet avifauna.

SUMMARY

- 53 In summary I acknowledge that a range of native avifauna utilise the inlet, some of which are resident and others visit seasonally. And I acknowledge that amongst these species are a number that have a national threat status.

- 54 However, due to the various foraging behaviours and diets of these species, only small numbers of a few species are likely to potentially be affected by sediment discharge.
- 55 With respect to undertaking a survey of coastal birds to determine areas of high value foraging habitat, this is made difficult due to:
- 55.1 The existing and continued discharge of sediment into the harbour through current land use activities. It will therefore be difficult or impossible to determine whether changes in habitat use can be attributed to the Project.
- 55.2 The relatively low numbers of wading birds recorded in the inlet make it difficult to detect any statistically significant results in terms of changes in foraging behaviour.
- 56 Thus, in my opinion, the most meaningful way to measure the potential indirect impact of sediment discharge into the harbour on foraging habitat is not through the survey of coastal birds, but through the monitoring of invertebrate indicator species that may form the diet of coastal wading species. As outlined in Dr De Luca's EIC (paragraph 23), monitoring of the marine ecological values (invertebrates and grain size) is proposed both prior to, during and post-construction.
- 57 Therefore, due to the points raised in this rebuttal evidence, I stand by the original conclusion that the potential impact of the Project on coastal avifauna will be no more than minor.
- 58 Furthermore, it is my opinion that the abundance and diversity of avifauna that could be potentially be affected by loss of mudflat and shell bed is significantly lower than the harbour is capable of sustaining, and that the limiting factors to the populations of these species is not availability of food.



Dr Leigh Sandra Bull
20 January 2012