Before the Board of Inquiry of the Environmental Protection Authority OMV New Zealand Ltd 2018 Marine Discharge Consent Application

IN THE MATTER OF
the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012

AND
An application by OMV New Zealand Ltd for a marine discharge consent to discharge harmful substances from the deck drains of a mobile offshore drilling unit associated with an exploration and appraisal drilling programme

Hearing statement by Lyndon DeVantier, PhD

4th September 2018

Introduction and Decision Sought

1. I am a marine scientist with a PhD in marine science from the University of Queensland, Australia (1995). Although speaking here in a private capacity, I am a member of the International Union for the Conservation of Nature (IUCN) Species Survival Commission and as such have participated in Red List assessments of extinction risk to threatened species.
2. This application (EEZ100017) should be declined or deferred. There is a significant lack of information on a broad range of issues, including, at its most basic, which harmful substances will be discharged.
3. Under section 61(1)(c), the EPA must (c) take into account any uncertainty or inadequacy in the information available, and under section 62(2), if, in relation to making a decision under the Act, the information available is uncertain or inadequate, the EPA must favour caution and environmental protection.
4. As noted in the CJT presentation, the application is premature, listing numerous related documents to be lodged for activities associated with the EAD, including applications for a marine consent and another marine discharge consent.

Disjoint processing

5. This prevents proper assessment of cumulative effects on the environment and existing interests, as required by the EEZ Act s 39(1)(d) and 59(2)(a)(i). The cumulative effects of the EAD programme, of

which the discharge of harmful substances is only one part, should not be assessed independently of the effects from other activities in the programme.

6. All the marine consent and discharge consent applications (notified and non-notified) associated with OMV's EAD programme should be assessed jointly (EEZ s 44), and with public input. This would help to provide EPA with a proper understanding of the risks of exploratory drilling and discharges, particularly the immediate risks and hazards associated with the drilling. It would also help to provide a better understanding of the cumulative effects of adding these activities to what is already a heavily industrialized region, in a rapidly changing physical, chemical and biological oceanographic regime of the Tasman Sea.

Cumulative effects

7. EPA has permitted all fossil fuel mining applications in South Taranaki Bight (STB) under the EEZ-CS Act to date, despite cogent warnings of the risks of cumulative effects on threatened species from independent cetacean specialists, including Prof. Liz Slooten and Dr. Leigh Torres.
8. The STB and eastern Tasman Sea region is of global importance for threatened cetaceans (Kaschner et al. 2011), and the cumulative effects on these and other threatened species are highly relevant under the EEZ-CS Act.
9. What is known about these cetacean species in STB waters, or globally for that matter? Do we have enough information about their biology, ecology, including feeding, breeding and migration patterns, to be certain, or even confident, that allowing yet more industrial activity over a decadal time period will be benign?
10. According to the IUCN Red List, six species are Endangered and one is Vulnerable (Table 1). A further 18 species are Data Deficient on the IUCN Red List, meaning there is not enough known about them by the leading specialists globally, or indeed nationally (Table 1), to enable a robust assessment.
11. Furthermore, there are few if any reliable data on population sizes of cetaceans in STB prior to industrialization on which to make useful comparisons, although we do know that the Maui dolphin population had crashed across its range, which includes STB.
12. To date, assessments of cumulative effects for the various notified applications that have been consented under the EEZ-CS Act for STB have focused principally on those of the application at hand, not on the overall impact, including synergisms, of adding that application to those already occurring and predicted to occur in STB. However, the Act states (my highlighting in bold):

> **s6. Meaning of effect**
>
> (1) In this Act, unless the context otherwise requires, *effect* includes—
>
> (a) any positive or adverse effect; and
>
> (b) any temporary or permanent effect; and
>
> (c) any past, present, or **future** effect; and
>
> (d) any cumulative effect that arises **over time or in combination** with other effects; and
>
> (e) any potential effect of high probability; and
>
> (f) any potential effect of low probability that has a high potential impact.
>
> (2) Subsection (1)(a) to (d) apply regardless of the scale, intensity, duration, or frequency of the effect.

And

s33. Matters to be considered …

(3) The Minister must take into account—

(a) any effects on the environment or existing interests of allowing an activity with or without a marine consent, including—

(i) **cumulative effects**; and …

(ii) the **effects of activities that are not regulated under this Act**; and

(d) the importance of **protecting the biological diversity and integrity of marine species, ecosystems, and processes**;

(e) the importance of **protecting rare and vulnerable ecosystems and the habitats of threatened species**; and

(f) **New Zealand's international obligations**; and

(i) the nature and effect of other marine management regimes; …

And

s28 Regulations classifying areas of exclusive economic zone or continental shelf

(1) Regulations made under section 27 or 29A may identify and provide for areas of the exclusive economic zone or the continental shelf that—

(a) are important or **especially vulnerable because of their biophysical characteristics**; or

(b) are important for specific uses; or

(c) must be managed in co-ordination with other marine management regimes; or

(d) are, or are likely to be, the subject of competition or **conflict arising from the incompatibility of different activities**; or

(e) are experiencing, or likely to experience, **cumulative adverse environmental** effects.

(2) The regulations may close an area of the exclusive economic zone or the continental shelf to all or any activities described in section 20 or subpart 2 of Part 2. (Excludes 'permitted activities')

13. In respect of S6, S28 and S33, anthropogenic climate disruption to the EEZ, including STB, should be considered under the Act as a major and growing cumulative effect. Our oceans are changing fast, with cascading effects through food webs.
14. As Hoegh-Guldberg and Bruno (2010) stated: "… *rapidly rising greenhouse gas concentrations are driving ocean systems toward conditions not seen for millions of years, with an associated risk of fundamental and irreversible ecological transformation. The impacts … so far include decreased ocean productivity, altered food web dynamics, reduced abundance of habitat-forming species,*

shifting species distributions, and a greater incidence of disease. … create enormous challenges and costs for societies worldwide ...".

15. Three summers of record heating in the Tasman Sea from 2015 have, in all likelihood, already had cascading effects through the food web, and impacted cetaceans. Such marine heatwaves (MHW) are predicted to become worse in coming decades (Frölicher et al. 2018): *"MHWs have already become longer-lasting and more frequent, extensive and intense in the past few decades, and … this trend will accelerate under further global warming. Between 1982 and 2016, we detect a doubling in the number of MHW days, and this number is projected to further increase on average by a factor of 16 for global warming of 1.5 degrees Celsius relative to preindustrial levels and by a factor of 23 for global warming of 2.0 degrees Celsius. However, current national policies for the reduction of global carbon emissions are predicted to result in global warming of about 3.5 degrees Celsius by the end of the twenty-first century16, for which models project an average increase in the probability of MHWs by a factor of 41. At this level of warming, MHWs have an average spatial extent that is 21 times bigger than in preindustrial times, last on average 112 days and reach maximum sea surface temperature anomaly intensities of 2.5 degrees Celsius.*"
16. STB is globally important for cetaceans in large part because of its productivity, evidenced for the baleen whales by the occurrence of krill *Nyctiphanes australis*. Krill populations, and hence those of their predators, shift seasonally throughout STB, related to upwelling, sea temperature and presence of phytoplankton (Bradford and Chapman 1988, James and Wilkinson 1988 among others).
17. Krill are at significant risk from increasing sea temperature (Johnson et al. 2011): "*Reduced nutrient availability in warm years leads to reduced production and a shift to smaller phytoplankton species, resulting in a drastic reduction in the biomass of larger zooplankton, especially krill* (Nyctiphanes australis)*."*
18. And Ocean Acidification (eg. Kawaguchi et al. 2013):"*Unless CO_2 emissions are mitigated, the Southern Ocean krill population could collapse by 2300 with dire consequences for the entire ecosystem."*
19. And indeed from seismic surveys (McCauley et al. 2017). There is a large and growing body of peer-reviewed science that has demonstrated harm from seismic blasting to cetaceans (eg. Tyack 2008, Clark et al. 2009, Di Iorio and Clark 2009, Castellote et al. 2012). Intense noise from blasting travels for large distances underwater, as illustrated below.
20. Case in point: In May-June of 2018, at least 13 sperm whales, most if not all males, died at sea in the area, from presently unknown causes. Record heating of the Tasman Sea and months of seismic blasting from the Amazon Warrior in the preceding summer, along with other industrial activities, are obviously not conducive to a harmonious environment for these threatened whales. It is likely they were under significant physiological stress which may well have contributed to their deaths.
21. Sperm whales, and other toothed whales, use echolocation in hunting, in a sense 'seeing with sound'. Exactly what impact on feeding, months of extremely loud repeated blasts from the Amazon Warrior had is not known, but on balance of probabilities it is likely to have been detrimental. Obviously I am speculating here. Why? Because the relevant studies, as outlined above, have not been done. Sperm whales dive to significant depths for extended periods, and hence may not have been sighted by the observers on board the Amazon Warrior.
22. Yet the Department of Conservation (DoC) claimed, in the 'Stuff' media, that it was extremely unlikely that the seismic blasting caused their deaths (https://www.stuff.co.nz/national/104292673/extremely-unlikely-seismic-surveying-linked-to-death-of-12-sperm-whales).

23. But this is not known for a fact. Indeed, it may well have contributed to them, along with the exceedingly high sea temperature and related disruption of food webs, all part of the cumulative effects of human activities locally, regionally and globally.
24. STB is heavily industrialized, with fisheries, fossil fuel exploration and mining, and with sea bed sand-mining remaining a contentious issue). This level of activity was well illustrated by Prof. Slooten in her graphic to the TTRL hearing (also see Torres et al. 2017).
25. Adding to these multiple impacts is the recently discovered fact that most marine mammals have lost the gene that provides the main defence against neurotoxicity from organophosphorus pesticides (Meyer et al. 2018) , used widely across New Zealand.
26. Given all these activities, in my view the regulatory approach to the ecosystems and threatened species of STB is more akin to a sacrificial zone than a globally significant 'hotspot' for marine mammals, and other threatened species. This, despite explicit acknowledgement of the Precautionary Principle.
27. Climate disruption, along with all the other cumulative effects, will increasingly impact this oceanographic setting, the food chains on which it is built and the trophic cascades that will follow, although I was unable to find any published work specific to STB, another apparent research gap.
28. In the present case, OMV plans to drill 12 exploration / appraisal wells across six licensed areas off the Taranaki coast, and discharge undetermined quantities of un-identified harmful substances at sea. International experience has demonstrated that there can be devastating environmental and socio-economic impacts across huge areas from exploratory drilling.

Failure of prudent governance

29. I hold serious concerns re the legislative process that resulted in the EEZ Amendment Act 2013 and subsequent regulatory changes in 2014 that enabled non-notification of exploratory drilling (Regulation 5). Use of a Supplementary Order Paper, thereby avoiding the select committee process and public submissions, was not, in my view, good or prudent governance, particularly given that it occurred only a few years subsequent to the disastrous 2010 Deepwater Horizon exploratory drilling catastrophe in the Gulf of Mexico. That single incident cost 11 lives, multiple billions of dollars in clean-up, and has left a multi-decadal regional environmental and human health disaster.
30. Exploratory drilling is inherently high-risk, as demonstrated by the Navigatus (2015) report to the Ministry of Transport. Drilling activity presents more risk than ongoing production activities. Given this, it is imperative that the required levels of assurance are increased before drilling commences to better reflect the potential financial implications of clean-up and compensation costs. Unknown risks include the pressure of the well, the substance in the well, and the volume of the well. Such drilling in the increasingly stormy Tasman Sea presents even greater risk. New Zealand has no adequate rapid response capability in the event of a well blow-out or other incident.
31. Given that there are already far more known reserves of fossil fuels that simply cannot be burnt if we are to avoid catastrophic levels of climate change, no further exploration should be permitted to occur. The EEZ-CS Act should be amended to a) prohibit future exploratory drilling; b) include considerations of the effects of emissions on climate change, to be consistent with the forthcoming Zero Carbon Act.

Lyndon DeVantier

4th September 2018

Selected References and recommended reading

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Kaschner, K., D.P. Tittensor, J. Ready, T. Gerrodette, B. Worm (2011) Current and Future Patterns of Global Marine Mammal Biodiversity. *PLoS ONE* 6(5): e19653. doi:10.1371/journal.pone.0019653. http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0019653

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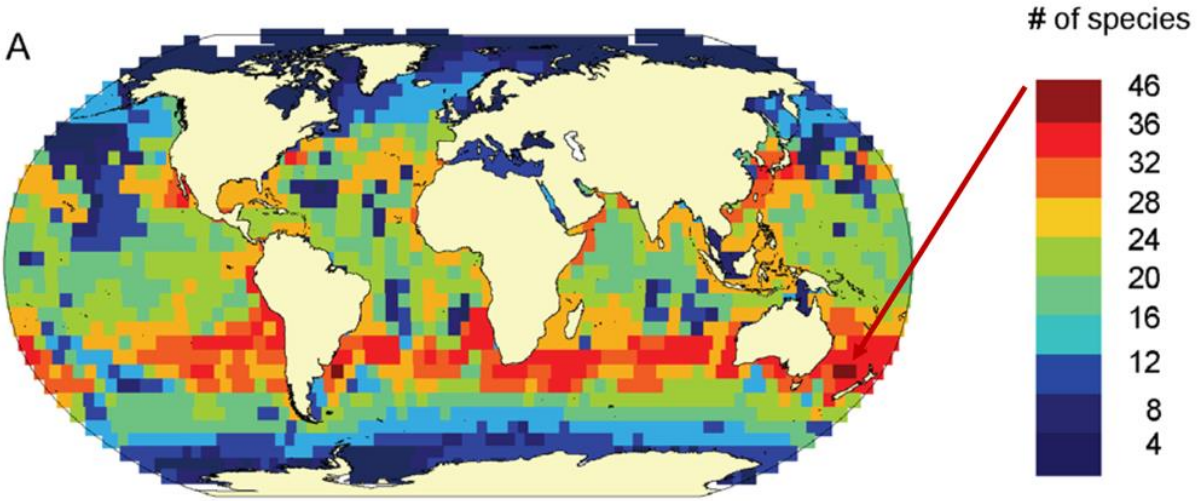
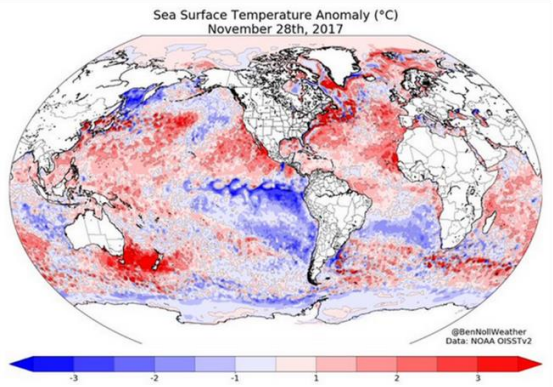
Table 1. Species identified from South Taranaki Bight region on IUCN Red List and NZ national list (in parentheses where different from IUCN). DD: Data Deficient; LC: Least Concern; Vu: Vulnerable; En: Endangered. * 3 spp. Nationally Critical (NC), ** 2 spp. Nat. Endangered (NE), *** 1 sp. Nat. Vulnerable (NV), NT – Not Threatened.

1. The "*foraging population*" of blue whales that was thought to exist off the Taranaki coast has been proved to be a genetically distinct population (Barlow et al. 2018).

Species	**IUCN Red List / NZ (if different)**	**Species**	**IUCN Red List / NZ (if different)**
Antarctic Minke Whale	DD (NT)	Risso's Dolphin	LC
Common Minke Whale	LC	Short-finned Pilot Whale	DD
Southern Right Whale	LC **(NV) *** **	Long-finned Pilot Whale	DD (NT)
Bryde's Whale	DD **(NC) ***	Spectacled Porpoise	DD
Sei Whale	**En**	False Killer Whale	DD (NT)
Humpback Whale	LC	Killer Whale	**DD (NC) ***
Fin Whale	**En**	Pygmy Sperm Whale	DD (NT)
Blue Whale	**En**	Southern Bottlenose Whale	**LC (DD)**
Pygmy Blue Whale (subspecies) 1	**En**	Hector's Beaked Whale	DD
Hector's Dolphin	**En (NE) ****	Shepherd's Beaked Whale	DD
Maui's Dolphin (subspecies)	**En (NC) ***	Cuvier's Beaked Whale	**LC (DD)**
Dusky Dolphin	DD	Ginkgo Toothed Beaked Whale	DD
Pan Tropical spotted Dolphin	LC	Gray's Beaked Whale	DD (NT)
Indo-Pacific Bottlenose Dolphin	DD	Arnoux's Beaked Whale	DD
Common Bottlenose Dolphin	**LC (NE) ****	Andrew's Beaked Whale	DD
Striped Dolphin	LC	Strap-toothed Whale	DD
Southern Right Whale Dolphin	**DD (NT)**	**Sperm Whale**	**Vu (NT)**

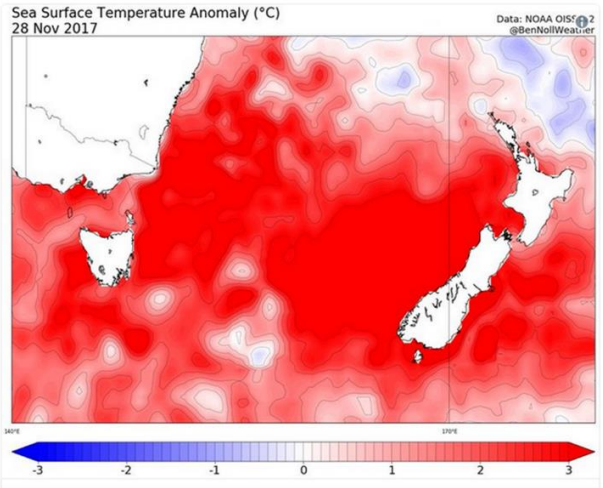


Kaschner et al. (2011) Figure 4. Validation with empirically observed marine mammal occurrences (56x56 cells, 1990–1999). A. Predicted species richness of all cetaceans.

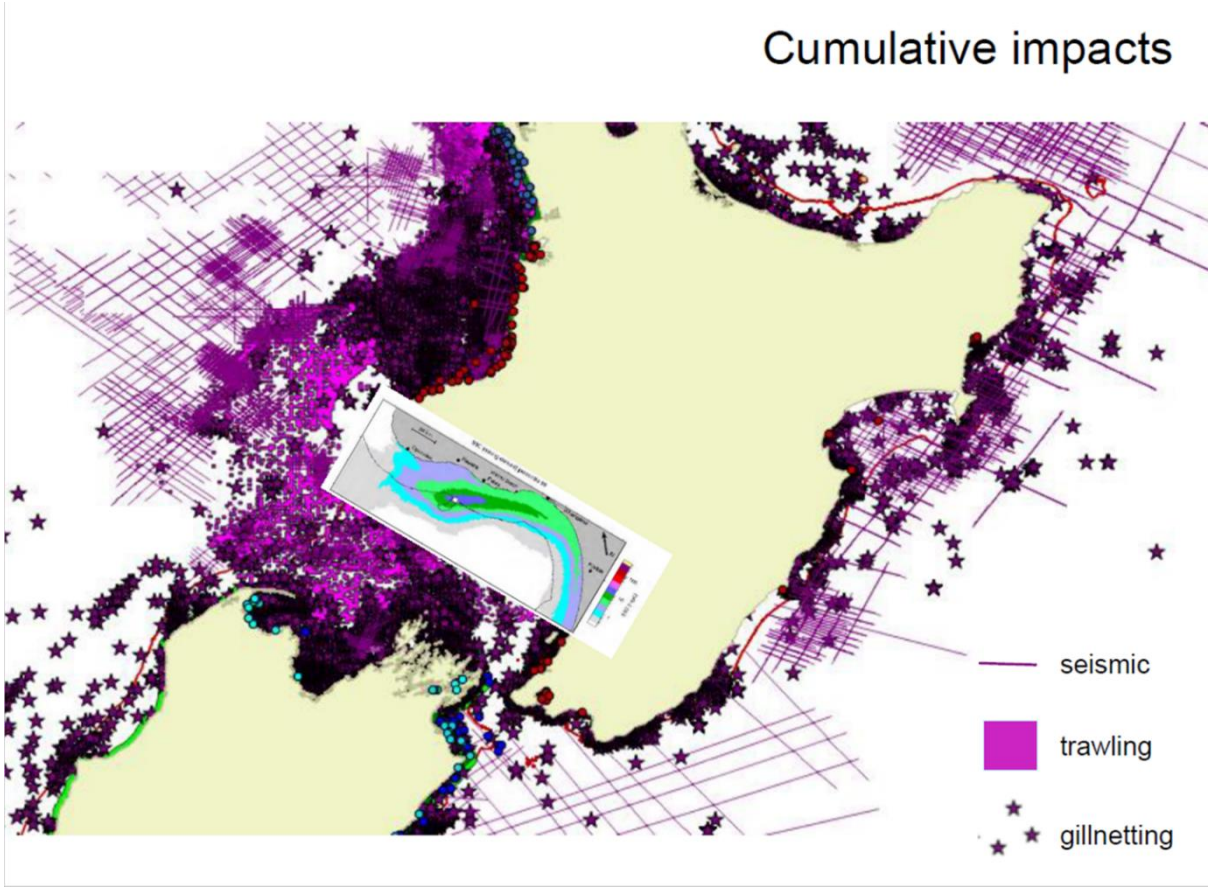


Record-breaking sea temps have cascading effects on food webs (eg. 'drastic reduction in krill biomass', Johnson et al. 2011)

Tasman Sea temperature 'snapshot' 28th Nov. 2017



NOAA 'Snapshot' of extreme heating of Tasman Sea in November of 2017.



Slide courtesy of Prof. Liz Slooten (TTRL hearing presentation).

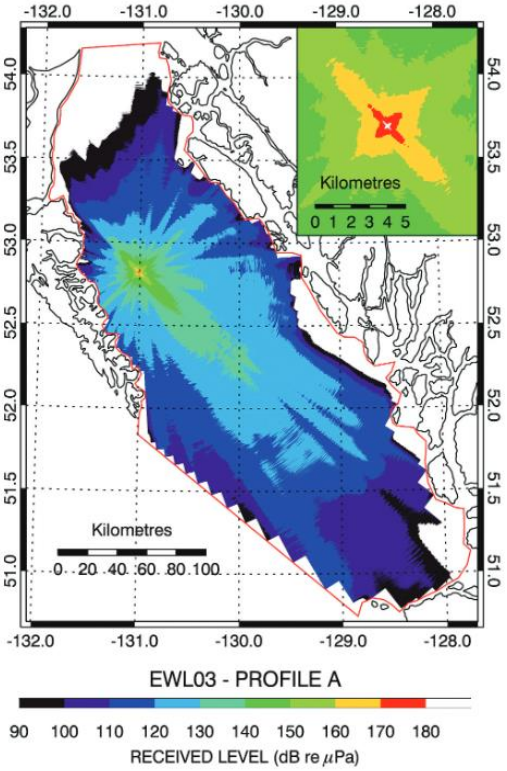


Photo: The Amazon Warrior's path of destruction, from Google Earth KMZ

Gisiner (2016) http://acousticstoday.org/wp-content/uploads/2016/12/Seismic-Surveys.pdf