Shell Taranaki Limited (STL) 2017: Applications for marine consent and marine discharge consent (EEZ100014).

Submission to EPA Decision-Making Committee by Lyndon DeVantier, PhD

3rd October 2017

Introduction and decision sought

I am a marine scientist with a PhD 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.

I request EPA to decline the STL application for a broad range of reasons relating to various sections of the EEZ-CS Act, as listed in my written submission (including but not limited to EEZ Act 2012 s10, s11B, s12, s39(2)(b), s41, s42a, s59(2), S61, s87E,F. I note that some of these sections have been repealed or replaced following passage of the Resource Legislation Amendment Act on 1st June 2017. I understand that these recent amendments do not affect the decision making process in the present case, which will be determined under the previous version of the Act, prior to the recent amendments.)

The application should also be declined because there is inadequate information to assess impacts, particularly from cumulative effects, with regard to NZ's international obligations under UNCLOS 1982, UNCBD 1992, Noumea Convention 1986, London Convention on Dumping and the Paris Agreement 2016.

Specific points

1. There is inadequate information provided on:

i. the composition and quantities of hazardous chemicals that will be released to the environment as a result of the drilling and related activities, and of their effects.

ii. the present condition and future integrity of the infrastructure, posing an unknown level of risk.

iii. the receiving environment and its biota. After decades of operation, STOS (now STL) has not provided adequate quantitative ecological or biophysical baselines, (eg. underwater noise levels), in some cases relying on work conducted for other operators which has only limited relevance.

2. There is no assessment of the economic and environmental costs of the 'externalities' of pollution arising from the application.

3. The cumulative effects and impacts of all these activities have not been addressed in a comprehensive manner in the Impact Assessment.

4. This lack of information across a broad range of matters relevant under the Act clearly warrants a Precautionary Approach and decision to decline the application.

Cumulative impacts in a global cetacean hotspot

5. In the brief time available, I focus on cumulative effects, the precautionary principle and our international obligations, noting the recent Memorandum of Counsel Response to DMC Minute 4, specifically in relation to EEZ-CS Act s 59(2) b i and ii.

6. To date, assessments of cumulative effects for the various notified applications that have been consented under the Act for South Taranaki Bight (STB) have focused principally on those of the application at hand, not on the overall impact, including possible synergisms, of adding that application to those already occurring and predicted to occur in STB.

7. In this respect, it is crucial to understand that the physical, chemical and biological oceanography of STB are changing, not just from local industrialization, but primarily via climate disruption. Rising sea temperature, ocean acidification and associated impacts on productivity and food webs will all increase in coming decades, a major part of the cumulative human impact in STB.

8. Apparently this has been summarily consigned to the 'too hard basket', at least according to STL witness Simon Childerhouse, who stated in evidence:

"To address cumulative impacts quantitatively is not possible, as it is not possible to collect detailed data on all potential impacts across the region and their potential interaction due to their complexity and scale."

9. There are in fact several quantitative and semi-quantitative approaches that can be used, as has been done elsewhere, including modelling future projections of changing sea temperature, acidification and productivity based on present conditions and various IPCC scenarios. This approach can examine future habitat marginality, and when coupled with population viability analyses (PVA) could provide important insights into future cumulative effects in STB on threatened species. Such an approach was recommended by Angliss et al. (2002), who proposed a general framework for recovery criteria of large whales that should:

be applied at the Distinct Population Segment (DPS) level (eg. STB for Pygmy Blue Whales);

be defined by the risk of extinction (Endangered);

be probabilistic;

use a Population Viability Analysis approach/philosophy;

and explicitly identify the acceptable risk and the time frame of consideration.

As far as I am aware, this has not been done for any of the threatened large whales in STB, although PVA has been used to assess population trends in Hector's Dolphin in the South Island (Slooten et al. 2000), and a risk assessment has been undertaken for Maui dolphin (Currey et al. 2012). PVA, combined with power analysis, was also used by Thomson et al. (2001) to assess a small, isolated population of Bottlenose Dolphins in Scotland, and demonstrated that:

"… this approach can be used to provide a more scientific basis for determining the level of precaution required to address particular management issues in this and other marine systems."

10. Why have such studies not been undertaken when they have been demonstrated to yield highly relevant information for management decisions when dealing with threatened species?

11. Despite having no quantitative data, cumulative impacts are all considered to be low or negligible, a particularly sanguine finding consistent across all applications in STB under the EEZ-CS Act to date, as Dr. Childerhouse noted:

"… assessments provided in the IA and other comparable assessments undertaken for other regional activities… also have assessments of low or negligible impact (e.g. such as those evaluated by the EPA in approved consents for OMV, STOS and TTRL)".

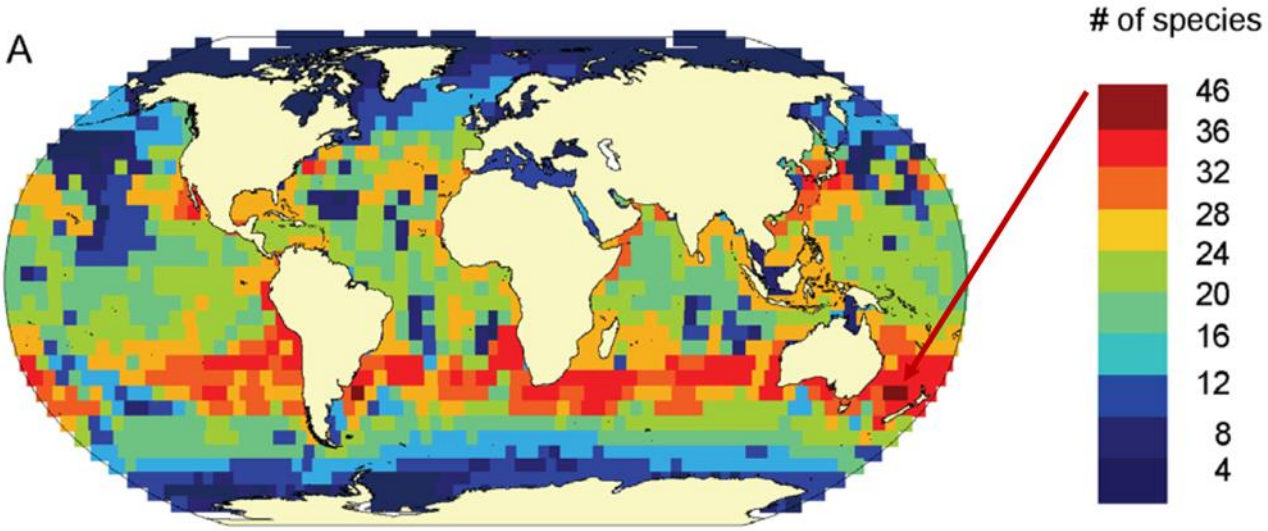
12. Independent cetacean specialists did not agree with these assessments, and raised serious concerns in respect of the previous applications. This begs the obvious question: how many 'low or negligible impacts' does it take to make a moderate or major impact? Or: how many industrial activities can we squeeze into STB with 'negligible impact' in a changing oceanographic regime? 'Having cakes and eating them' comes to mind.

13. Torres et al. (2017): *"Cumulative and isolated impacts on blue whales and their habitat from these activities should be carefully considered by environmental managers. In particular, elevated anthropogenic ocean noise may disturb blue whale behavior and physiology, with consequences for individual health and population viability."*

Indeed Dr. Childerhouse effectively, if perhaps inadvertently, makes this point in his comment re noise *"… that the source levels from these operations are significantly quieter that the noise from large container vessels (e.g. typically 186-198 dB re 1µPa @ 1m from vessels 100-200m in length; Pine et al. 2016) commonly transiting through the Taranaki area".*

14. Dr. Childerhouse concluded *"With respect to cumulative noise impacts from the activity, I note that there has been significant oil and gas development (including production, drilling and exploration) in this region for several decades and marine mammals are still regularly found there."* Indeed there are. At least 20 species of marine mammal have been reported from the Maui field AOI itself.

15. This is because STB is a global hotspot for cetaceans. According to Kaschner et al. (2011), South Taranaki Bight and adjacent waters host the highest cetacean diversity on Earth, along with an area off eastern South America (their Figure 4A, reproduced here, http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0019653).



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

16. Yet I was unable to find any reference to STB's global importance for cetaceans in any of the STL evidence, perhaps I missed it. Dr. Childerhouse's conclusion also fails to consider the 'shifting baseline'. 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 has crashed across its range, which includes STB. It also fails to acknowledge that some of

these species are nationally and/or internationally threatened. According to the IUCN Red List, six species are Endangered and one is Vulnerable (Table 1).

17. How much do we actually know about these 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?

18. It turns out we do not know much, despite Dr. Childerhouse's and other STL witnesses' assurances to the contrary. In fact 18 species are Data Deficient on the IUCN Red List, meaning there is not enough known about them by the leading specialists globally to enable a robust assessment.

19. Surely having six endangered species, one vulnerable species and another 18 species that are data deficient is cause for concern, and a powerful reason for adopting a cautionary approach. Surely more studies like those of Prof. Slooten on Hector's Dolphins (2000) and Dr. Torres on Blue Whales (2013, 2017) in STB should be initiated. This is a global hotspot after all.

20. The lack of quantitative data, and of predictive analyses of habitat marginality and population viability, is a very poor reflection on fulfilling our commitment to meeting international obligations. These include the United Nations Convention on Biological Diversity, Article 8, which requires the following of Parties, including New Zealand (which signed and ratified the Convention in 1992 and 1993):

Article 8(d) Promote the protection of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings;

Article 8(f) Rehabilitate and restore degraded ecosystems and promote the recovery of threatened species,…

21. I do not consider that proper consideration has been given to these Articles in previous applications under the EEZ-CS Act, and I note that the Memorandum re DMC Minute 4 does not exclude such consideration.

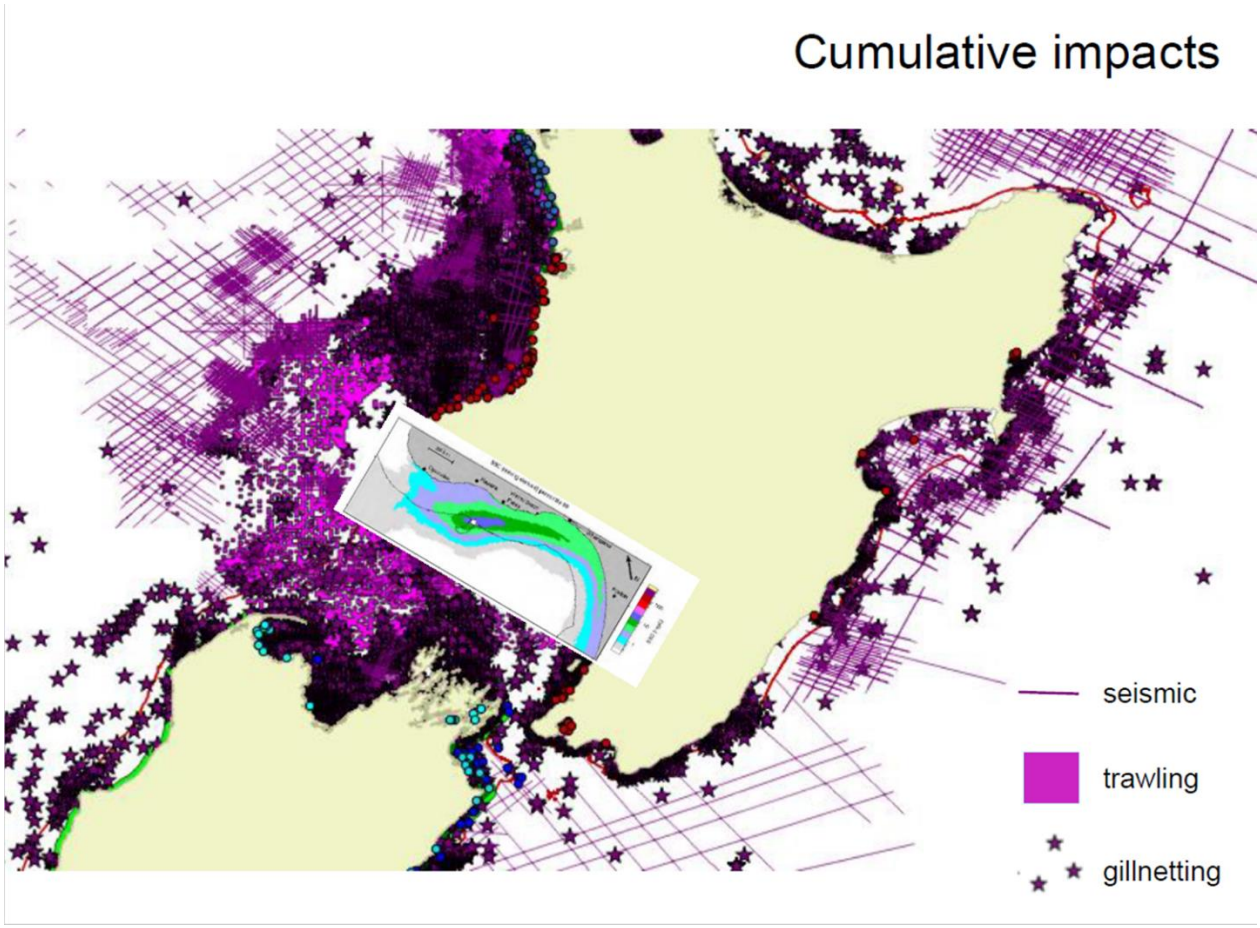
22. At present the regulatory approach to the ecosystems and threatened species of STB is more akin to a sacrificial zone than a globally significant 'hotspot' for marine mammals, and other threatened species.

23. STB is heavily industrialized, with fisheries, fossil fuel exploration and mining, and with sea bed sand-mining now consented. This level of activity was well illustrated by Prof. Slooten in her graphic to the TTRL hearing (also see Torres et al. 2017).

24. Both Prof. Slooten and Dr. Torres have now warned repeatedly against increasing industrial activity in STB. These independent scientists, acknowledged world experts, have nothing to gain from this, other than maintaining their professional integrity in stating the case for caution.

Table 1. Species identified from South Taranaki Bight region on IUCN Red List. DD: Data Deficient; LC: Least Concern; Vu: Vulnerable; En: Endangered.

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



Reproduced from Prof. Slooten's evidence to TTRL hearing.

Whales in the Bight and an elephant in the room

25. The EEZ-CS Act explicitly excludes consideration of the effects of an activity on climate change, surely a pertinent example of that famous old quote comparing laws and asses. This benighted foolishness notwithstanding, as noted above, 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.

27. 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).

28. 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.

29. Across the ditch, however, a major peer-reviewed paper by Johnson et al. (2011) examining cascading impacts of climate change reported:

"*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).*" Krill are also at significant risk from ocean acidification (eg. Kawaguchi et al. 2013), and indeed from seismic surveys (McCauley et al. 2017).

30. In summary, the oceanographic, biological and ecological conditions that support the globally important diversity of cetaceans and other threatened species in STB are not static, to which additional impacts can be added incrementally. Rather, these are changing in response to climate disruption and ocean acidification, and will continue to do so for decades to centuries, a highly significant future cumulative effect that can and should be modelled.

As Sir Peter Gluckman (2013) pointed out': *"For New Zealand, the resulting impact of changes in wind patterns, precipitation, and the chemistry of our oceans can be expected to be at least as significant as the changes in temperature itself."*

I think it is incumbent upon the DMC to consider this carefully in this and all future applications under the Act.

31. It is also clear that STL's parent company Shell, which *'… owns 100% of operating company Shell Taranaki Ltd.'* (http://www.shell.co.nz/about-us/who-we-are.html), holds significant responsibility for these impacts, and not just in STB. Shell is one of the top 10 fossil fuel 'carbon majors' most responsible for the greenhouse gas emissions driving climate disruption and related changes to our oceans (Griffin 2017).

A false economy

32. Here is what the American Association for the Advancement of Science had to say a decade ago, back in 2007: *"The scientific evidence is clear …. Accumulating data from across the globe reveal a wide array of effects: rapidly melting glaciers, destabilization of major ice sheets, increases in extreme weather, rising sea level, shifts in species ranges, and more. The pace of change and the evidence of harm have increased markedly over the last five years. … Delaying action … will increase the environmental and societal consequences as well as the costs. The longer we wait …, the harder and more expensive the task will be."*

33. Unfortunately, NZ's resource management, biodiversity conservation and climate change legislation is in disarray in respect of delivering a coherent planning and management regime for a sustainable future, a situation hindered rather than helped by the recent Resource Legislation Amendment Act and continued fiddling with the failed Emissions Trading Scheme. The various legislative changes that have been introduced since 2012, including non-notification of various consents precluding public scrutiny, is not consistent with participatory democracy.

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