Triview: consideration of potential effects

- On 24 May 2014 the Triview grounded on a reef some 930 metres more or less northwest of beaches and the mouth of the Waiwhakaiho River on the north Taranaki coast.
- 2. The ship was carrying (more or less) 400 tonnes of fuel oil and 8200 tonnes of soy meal as its cargo.
- 3. The hull of the Triview was holed. In the event, the ship was removed from the reef without a rupture to either its fuel tanks or its cargo holds.
- 4. I have been asked to provide a view on the possible consequences had either or both of those possibilities eventuated
- 5. In summary, I consider that had the fuel tanks been ruptured, there would have been significant adverse consequences, both in scale and in severity.
- 6. I consider that had the cargo holds been ruptured, there would have been significant adverse effects. The scale of these effects would have been dependent upon a number of contributing factors, including the amount of soy meal that might have been lost from the ship, the rate of loss, the sea and tidal conditions following the grounding, and the time interval before removal of the ship and its remaining cargo.

Loss of fuel oil

7. There have been several events giving rise to discharges of oil in coastal waters around New Zealand in recent years. It is very informative to put the significance of the Triview grounding into the context of these other events. Table 1 sets out this perspective.

Name	Jodi F Millennium	Umuroa	Rena	Triview
Date	2002	2007	2012	2014
Distance from shore	Near foreshore	50 km	12 nautical miles	Near foreshore
Volume of oil lost	25T bunker oil	32T crude oil	350T bunker oil	400T oil* 8200 T soy meal*
Volume of oil on shore	25T	23T	200T	-
Length of coastline affected (approx)	8 km	14 km	55 km	-
Cost of clean-up	\$4 million	\$120,000	\$50 million	-

*Fuel and cargo was not lost from Triview. This report assesses the consequences had the loss occurred

- 8. From the above, it is readily apparent that had a loss of fuel oil occurred from the Triview, it would have been the greatest quantity of oil lost into the marine environment, and because of the proximity of the site of grounding to the foreshore, it would have been in every likelihood the greatest discharge of oil into a shallow benthic/near shoreline/coastal environment within New Zealand's waters, in living memory.
- 9. Given that effectively twice as much oil would have reached the foreshore and near shore zone from the Triview as had from the Rena, and ten times as much as had from the Umuroa, it is beyond doubt that the potential ecological and amenity effects of the oil spill would have been of much greater magnitude than for either of these events.
- 10. Prevailing littoral drift on the north Taranaki coastline is predominantly to the north east along the coast, but with some tidal movements there is also some transportation in the opposite direction. Thus, the transport of oil (and cargo had cargo loss occurred) would have been overall north-east, affecting beaches, kaimoana reefs, other sub-tidal and inter-tidal reefs, rocky outcrops, and estuaries, towards Bell Block (3.3 km), Waitara (10 km), Onaero (20 km), Urenui (24 km), Wai-iti (33 km), Pukearuhe (37 km), the White Cliffs (42 km), and Tongaporutu (46 km). In the opposite direction, central city beaches, the walkway, and the foreshore to the Port (9 km), and beyond to Back Beach and Waireka and Oakura (15 km) would have been impacted.

- 11. The nature and duration of the effects, had a spill occurred, would depend on a wide range of factors. The nature of the environment potentially impacted, including coastal areas of significance and threatened species, are covered in the report by Dr Emily Roberts 'Damage to the Waiwhakaiho Reef Caused by the Grounding of the MV Lake Triview', highlighted at paragraphs 35-38 of her statement.
- 12. In summary, if an oil spill had occurred seabirds would have been particularly vulnerable through fouling of plumage and ingestion of oil during preening. Nationally threatened seabird species occurring within the area include the black fronted tern, banded dotterel, red-billed gull, Caspian tern, flesh-footed shearwater, white heron and reef heron. Whale and dolphins could have been impacted by floating oil when surfacing to breath or breach. Orca and Maui's dolphin are nationally critical species reported to occur within the area. A breeding colony of New Zealand fur seal is known to occur at the Sugar Loaf Islands (9.5 km from the Waiwhakaiho Reef). These seals could have come into contact with oil while hauling out of the water and spending time on land. Seals are vulnerable to oil because they rely on their fur to regulate body temperature.
- 13. Shoreline communities would have been exposed to the effects of an oil spill from the MV Lake Triview. On the whole, intertidal rocky shore communities are considered to be relatively resilient and would have been expected to recover reasonably quickly following an oil spill. Estuaries and river mouths (e.g. at the mouths of the Waiwhakaiho and Waitara Rivers) would have been more susceptible to long-term effects, as oil could have been incorporated into fine sediments through flocculation, potentially persisting for many years.
- 14. Residents of Taranaki would also have been impacted by an oil spill through contamination of kaimoana, loss of public amenity at valued recreational beaches and estuaries and offence to and loss of mana for local iwi.

Loss of soy meal cargo

- 15. Soy meal is highly putrescible and high in nitrogen. When released into the natural environment, the consequences would be an immediate loss of oxygen as decomposition begins, and hypernutrification (nutrient over-enrichment). The nitrogen released can be taken up by microorganisms and seaweed ie potential for eutrophication, which would result in a shift in and degradation of ecological communities and possible ongoing damage as nutrients are recycled.
- 16. Because of many different potential pathways of loss of the soy meal, it is not possible to identify a most likely scale of effect that is beyond reasonable doubt. The scenarios range from a few tonnes to most of the cargo. However, the nature of effects is more certain.
- 17. Seawater contains around 10 grammes of oxygen per tonne of seawater when saturated with dissolved oxygen. Soy meal on the other hand would generate a demand for oxygen in the vicinity of or more than 500,000 grammes of oxygen per tonne. In simple terms, one tonne of soy meal could strip the oxygen out of 50,000 tonnes (cubic metres, more or less) of seawater. There would in any natural environment be a number of confounding factors to this simple equation-eg the rate of ongoing deposition of additional soy meal; the rate of re-aeration of seawater due to turbulence; the depth of seawater to the point of deposition of oxygenated seawater to zones of deprivation; the effects of any tidal movement in promoting mixing, etc; but the potential for widespread oxygen depletion is obvious and indisputable.
- 18. Depletion of oxygen stresses and in more severe situations suffocates marine life. It creates stagnant zones. These need not be widespread, and could be created wherever water is quiescent eg between rock or in crevices.
- 19. Smothering by deposition of soy meal and its rapid decomposition would suffocate micro and macro flora and fauna. Increased turbidity within the water column would depress photosynthesis by phytoplankton (photosynthetic plankton) and seaweed. Aversion behaviour would be expected from motile species. A high level of

nitrogen would facilitate algal proliferation (although other factors would also have to come into play for a widespread 'bloom' to occur).

This statement has been prepared by Gary Bedford, Director-Environment Quality, Taranaki Regional Council.

Gary Bedford: Statement of qualifications and experience in Appendix.

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Gary Bedford Director-Environment Quality, Taranaki Regional Council

Appendix

- 1. My full name is Gary Kenneth Bedford. I live in New Plymouth.
- 2. I am the Director-Environment Quality at the Taranaki Regional Council ("the Council"). I have been employed by the Council for twenty-four years.
- 3. I hold a Bachelor of Science degree from the University of Auckland and a Master of Applied Science degree from the University of New South Wales. My Master's degree included studies in water pollution, waste analysis science, risk assessment, and hazardous wastes management.
- 4. I have a postgraduate Diploma in Science in environmental science.
- 5. In my role at the Council, I am involved in assessing applications for resource consents in relation to land, water, and air, in preparing and supervising compliance and regional environmental monitoring programmes across marine, air, water and soil environments, supervising the Council's scientific staff across a range of scientific disciplines, and managing the Council's research and investigations. Of the scientific disciplines covered by the Science Services Section of the Council, I am particularly responsible for waste management, hazardous wastes, and contaminated sites, and for leading the Council's programmes of monitoring and research into actual and potential environmental consequences in association with the hydrocarbon industry in Taranaki.
- 6. I am trained and qualified by Maritime New Zealand to act as a Planning and Intelligence Manager in the event of a regional or national level oil spill. This training encompassed oil spill response strategies, oil characteristics and behaviour, ecological consequences of oil spills, clean-up techniques, the tracking of oil spills, and waste management.
- 7. Prior to my employment at the Taranaki Regional Council, I was employed as the laboratory manager at the New Plymouth District Council's wastewater laboratory, where I was responsible for that Council's analytical programme for waste waters and trade wastes, as well as providing general laboratory services to the District Council's various departments. During that time the laboratory was accredited by the

Testing Laboratory Accreditation Council of New Zealand (TELARC), with myself as accredited signatory.

- 8. For three years, I was a part-time tutor in final year NZCS chemistry at the Taranaki Polytechnic Institute, lecturing and taking laboratory courses in air, water, and metals chemistry. I have acted as an assessor for TELARC, (now referred to as IANZ), auditing environmental laboratories throughout New Zealand for competence and adequacy of performance.
- 9. I have read the Practice Note prepared by the Environment Court on the Code of Conduct for Expert Witnesses and agree to comply with it. In preparing my report, I have made use of information and material from various sources where I have considered myself competent to interpret and apply such information to assist the Court. Other than in such cases, my evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.