

EVIDENCE OF DR AMBER SUSAN DUNN

1 Qualifications and Experience

- 1.1 My name is Amber Dunn and I am a coastal scientist. My highest qualification is a Doctor of Philosophy (PhD) in Earth & Coastal Sciences from the University of Waikato. I also have a Master of Science degree, with Honours.
- 1.2 Past experience includes resource management consenting at Opus International Consultants, and a coastal and management planner at the Department of Conservation. I acted as the coastal scientist in the formulation of the WBEMS. Furthermore, I am a qualified Resource Management Commissioner.
- 1.3 My Master's thesis is titled *Coastal Erosion at Wainui Beach, Gisborne* and it collected information to define shoreline behaviour, the hydrodynamic regime, and to isolate the coastal processes associated with the erosion at Wainui.
- 1.4 My PhD thesis is titled *Coastal Storm Activity along the Eastern North Island of NZ*. The primary focus area was the Gisborne coastline, and it identified a set of coastal storm types and their meteorological characteristics - frequency, generation, intensity and paths - and their damaging effects.
- 1.5 My chosen sport in my teenage years was competitive surfing. I represented both Gisborne and New Zealand, and am a past National Grommet Surfing Champion (1995).
- 1.6 I have **more than** "visited the site on several occasions". I was born in Gisborne, grew up here, and lived at Wainui Beach between 1990 and 2000 (when I left to pursue academic goals). Wainui Beach is my most favourite PLAYGROUND, and always will be.
- 1.7 I witnessed and experienced the most extreme erosion at Wainui Beach in more recent times (1992-95) when several hard structures on the Wainui beachfront failed and emergency rock revetments or dumped rock were placed along the beach. I have followed all the scientific reports by world renown coastal experts such as Prof Paul Komar (Oregon State University)

and the late Prof Bob Dean (Uni of Florida). Taking all of this together, I know Wainui Beach intimately and scientifically.

2 First Things First - Proposed Coastal Environment Plan

- 2.1 I would like to draw to your attention the status of the Gisborne District's Coastal Plan. While the RMA came into effect in 1991, here in Gisborne we still only have a "first-generation" "proposed" Coastal Environment Plan that went to public notification in July 1997. That makes the "proposed" Coastal Plan over 20yrs old and it has never been made operative. And, this Coastal Plan does not take into account the requirements of the NZCPS (2010).
- 2.2 This old Coastal Plan has been merged into the new Tairāwhiti Resource Management Plan (2017) - yet its contents has not changed since the mid-late 1990s. Therefore, in terms of the 'hierarchy' of planning instruments, the NZCPS provisions should take precedence.

3 Coastal Erosion at Wainui Beach

- 3.1 As already stated, I have done considerable research on Wainui Beach (WB) - yet this research was ignored or overlooked by Dr Shand. In his statement of evidence he only refers to the work of Dr Jeremy Gibb. Alarming.
- 3.2 My long-term shoreline changes showed erosion of the bounding headlands (Tuaheni & Makorori Points) and accretion of the sandy embayment between them. That is, the sandy beach has an accretionary trend. Therefore, where Dr Gibb found an erosion trend for the sandy beach, Dunn found accretion.
- 3.3 Of most significance to the erosion of Wainui is the **high level of short-term variability** in shoreline position, or a high level of **storm-generated erosion**. These movements occur regardless of the long-term trend. In other words, the most destructive shoreline changes or erosion at Wainui Beach come from storm events - and have magnitudes far greater than the long-term trend.
- 3.4 This same situation or condition, whereby storm-generated erosion dominates over the long-term trend and drives episodic erosion has been documented in

other locations in NZ and world-wide (e.g. Oregon Coast, USA; Florida, USA; Coromandel Coast, NZ).

- 3.5 I mapped the seafloor morphology and distribution of major geomorphologic units through a side-scan sonar survey. The seafloor offshore from Wainui is very complex, and consists of a shore-parallel rocky bank and two SE-trending reef systems. These structural features on the seafloor confine a localized sand belt within the nearshore, and indicated the beach is essentially a thin veneer of sand on a predominantly rocky basement (DUNN, 2001).

4 Two Remaining Concerns: The 'part' replacement and the "Intersection"

Part Replacement

- 4.1 I've heard this morning about the "replacement of the failing rail and log seawall" (applicant, Neil Daykin); that it is "nearing its end of life", and it has "no end effects now" (Dr Shand).
- 4.2 It needs to be made clear: the applicant is proposing to replace a **small section or part** (~40m stretch) of the **whole** rail and long wall at the southern end of Wainui. This means a large part of the "failing" rail-log wall with dangerous components **will remain** on the beachfront north of the proposed revetment. In other words, this rail-log wall north of the Tuahine Crescent accessway is also "failing" and near its end-of-life. There is no continuity to this proposed structure.
- 4.3 I also read in the presentation that the "rock revetment at 21 Wairere Rd is inconsistent with the NZCPS". Can I, logically, infer from this, that the proposed rock revetment at Tuahine Crescent is also "inconsistent with the NZCPS"? If not, then an explanation needs to be provided.

The Intersection/Boundary between the Old and the New Protection Structures

- 4.4 It is my view that the boundary, or intersection, between the proposed 4.8m-high revetment and the existing structures further northward still needs attention.
- 4.5 At 4.8m high and being 3.5m wider, it is substantially larger than the current structure (rail-log wall), and will create a large anomaly at the shoreline. I

repeat: the adjacent, remaining, unchanged rail-log wall further north of the proposal is "failing" and at "end-of-life".

- 4.6 This means the private properties immediately northward of the new proposed revetment could experience increased erosion due to the differences in size, height, design (e.g. slope), and construction material. In the coastal science world, we call this "end effects" - a well known negative or adverse flow-on effect of seawalls or revetments (hard engineering structures).
- 4.7 Dr Shand acknowledges this point in his SoE (paragraph 6.6) where he states " If this existing revetment were to be removed or were to fail, increased reflection and turbulence off the end of the proposed revetment could induce additional erosion (end effects) for 20-30m...". We have been told repeatedly the existing rail-log wall is "failing" and at end-of-life; therefore, we should be planning for its failure, now.
- 4.8 This must be addressed in this application, so that we do not find ourselves in a situation where we 'protect Peter, but not Paul'; or worse still, 'have protected Peter, and therefore, we must protect Paul', and revetment 'creep' occurs.
- 4.9 I heard the applicant say the GDC reserve land to the north has the ability to absorb any "end effects". I take that to mean erosion in this area is acceptable - that it is a 'sacrifice zone'. I therefore ask:
- a. Is this a consistent principle to be applied to the whole of Wainui Beach, and consistent with the WBEMS, or a convenient ad-hoc approach to suit the current application? and
 - b. What magnitude of erosion is being allowed for? and
 - c. How does this approach affect the residents and households immediately behind this zone?

5 Other Matters - Statement of Evidence of Rueben Hansen

- 5.1 In paragraph 2.3, Mr Hansen, states "the slope, height, and geology of the shoreline at the revetment site are significant contributors to the 'extreme risk erosion zone' classification assigned to 2, 4, 6 and 8 Tuahine Crescent...". This argument **equally applies** to the area immediately northward that isn't included in the proposal - its slope, height and geology are significant

contributors to it also being in the 'extreme risk erosion zone' . As are the proximity of houses to the dune edge.

- 5.2 I would also challenge paragraph 3.17 where it states ***'it is clear that the form, location, and design of the revetment will minimise adverse effects on the coastal environment'***. If I was the several homeowners on the immediate northern side of this revetment I would be anxious about a large rock structure at 4.8m height and extending 3.5m further seaward than my knowingly "failing" ~2-3m log wall; one slopes, the other is vertical as shown in Fig. 2 of Dr Tom Shand SoE.
- 5.3 Nor would I believe there will only be minimal effects. This junction, or intersection, between the "old and the new" is the weak link; it is the area where the most severe adverse effects will be felt during storm conditions - which is when the real oceanic conditions will test it. We are talking about a new structure designed for a 1 in 100yr storm event next to a "failing" and "end-of-life" smaller wall.
- 5.4 My concern is for those northern next-door neighbours who are begin told today that this design will have "minimal adverse effects on the coastal environment' in front of their properties. End effects are real; they are well documented the world over. I therefore urge you to shine a very bright light on this aspect to ensure that we don't 'protect Peter' and 'hurt Paul'. This is where the argument of a sloping versus a vertical wall comes into play. Please give this issue the attention it deserves.

.....**6th February 2018 - Dr Amber Dunn**