



*Western*

*Australia*

## **RECORD OF INVESTIGATION INTO DEATH**

*Ref No: 18/17*

*I, Barry Paul King, Coroner, having investigated the death of **Jarrold Arthur Hampton** with an inquest held at the **Perth Coroner's Court** on **15 May 2017 to 18 May 2017** and on **22 May 2017 to 26 May 2017**, find that the identity of the deceased person was **Jarrold Arthur Hampton** and that death occurred on **14 April 2012 in the waters of the Indian Ocean approximately 90 nautical miles south of Broome** from **drowning secondary to incapacitation from air embolism** in the following circumstances:*

### **Counsel Appearing:**

Sergeant L Housiaux assisted the Coroner  
Ms G A Archer SC (instructed by Corrs Chambers Westgarth) and  
Mr N D Ellery appeared for Paspaley Pearling Company Pty Ltd  
Mr A Coote appeared for the deceased's family  
Mr P Hopwood appeared for the Pearl Producers Association  
Ms H C Richardson (State Solicitors Office) appeared for WorkSafe

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## INTRODUCTION

1. On 14 April 2012 Jarrod Arthur Hampton (the deceased) was engaged as a pearl shell drift diver with Paspaley Pearling Company Pty Ltd (Paspaley) as part of the crew aboard a pearling vessel, the MV Paspaley II, approximately 90 nautical miles south of Broome.
2. At about 4.00 pm that afternoon, divers from the Paspaley II were carrying out their last dive of the day when the deceased surfaced a least twice in apparent distress. He then re-submerged without his compressed air regulator in his mouth. He remained submerged until crew members managed to pull him to the Paspaley II, by which time he showed no sign of life. Crew members administered CPR but they were unable to revive him.
3. The circumstances of the deceased's death were investigated by police officers from the Western Australian Police Dive Squad and the Coronial Investigation Unit on behalf of the Broome Coroner. Relevant information and evidence obtained by police investigators was shared with inspectors from WorkSafe WA (WorkSafe).
4. On 18 July 2012 the Broome Coroner referred the investigation to the State Coroner with a view to the holding of an inquest. At some stage thereafter, the State Coroner instructed Sergeant Housiaux, as counsel assisting, to prepare the matter for inquest.
5. In the course of preparing for inquest, Sergeant Housiaux contacted WorkSafe in April 2013 to inquire whether it intended to prosecute anyone involved in the deceased's death. The Commissioner of WorkSafe promptly replied that he had yet to determine whether to lay charges under the *Occupational Safety and Health Act 1984*.

6. On 3 May 2013 the first call-over for an inquest was held in the Coroner's Court in Perth before the State Coroner.
7. On 5 July 2013 the second call-over took place. The State Coroner requested that WorkSafe advise the Court as soon as practicable of its decision whether to lay charges, since it would not be appropriate to list the matter for inquest if a charge was likely to be laid. Counsel for WorkSafe indicated that its investigation was almost complete but that, once completed, its file would be forwarded to the State Solicitor's Office for consideration.
8. At the next callover on 2 August 2013 before the Acting State Coroner, counsel for WorkSafe advised that WorkSafe's investigation was complete and that its file was with the State Solicitor's Office.
9. On subsequent call-overs until 4 July 2014, the Coroner's Court was advised by WorkSafe that no decision had yet been made in relation to a prosecution. Prior to a call-over on 1 August 2014, WorkSafe advised the Court that it would prosecute Paspaley. At that call-over, the State Coroner adjourned the matter indefinitely.
10. From what I can gather from the materials available, it seems clear that in 2014, WorkSafe charged Paspaley with an offence under sections 19(1) and 19(3) of the *Occupational Safety and Health Act 1984* for failing so far as was practicable to provide and maintain a working environment in which its employees were not exposed to hazards. The charge did not allege that Paspaley caused the deceased's death.<sup>1</sup>
11. After the charge was laid, there was a substantial adjournment in which WorkSafe and Paspaley negotiated the particulars of the charge. Once there was agreement on the form of the particulars, Paspaley

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<sup>1</sup> Exhibit 1, Volume 1, Tab 21; Ss 19 and 19A *Occupational Safety and Health Act 1984*

indicated at an early stage that it would plead guilty to the charge. The hearing of the sentencing process took place before a magistrate in Broome on 19 October 2015.<sup>2</sup>

12. In April 2016, the State Coroner formally approved the holding of an inquest. The matter was then placed back onto the call-over list for 3 February 2017. At about that time I was allocated to preside as coroner for an inquest that was listed for 10 days from 15 May 2017.
13. From 15 to 18 May 2017 and from 22 to 26 May 2017, I held an inquest at the Perth Coroner's Court into the deceased's death.
14. The focus of the inquest was on the circumstances surrounding the deceased's death and on Paspaley's safety procedures at the time.
15. I have found that the cause of death was drowning secondary to incapacitation from air embolism.
16. As to the circumstances surrounding the deceased's death, I have found that death occurred by way of misadventure.

## **THE EVIDENCE**

17. The documentary evidence adduced at the inquest comprised:
  - a. a seven volume brief of evidence,<sup>3</sup> including reports prepared by officers of the Water Police Dive Squad of the Western Australia Police (WAPOL);<sup>4</sup>

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<sup>2</sup> Exhibit 1, Volume 1, Tab 21

<sup>3</sup> Exhibit 1

<sup>4</sup> Exhibit 1, Tabs 9, 10 and 11

- b. a report by Dr James Caruso, chief medical examiner of Colorado, together with his curriculum vitae;<sup>5</sup>
- c. Australia Standard AS 2299.1:2007 (AS2299);<sup>6</sup>
- d. a product data sheet for Kirby Morgan M-48 Supermask;<sup>7</sup>
- e. the witness statement of Anthony Thiel, Paspaley's general manager of pearl production;<sup>8</sup>
- f. a report by Robert Gatt, executive director of the Australian Diver Accreditation Scheme;<sup>9</sup>
- g. 'Diving and Subaquatic Medicine, Fourth Edition', Chapter 65;<sup>10</sup>
- h. the statement of Brett McCallum, executive officer of the Pearl Producers Association (PPA) in 2012;<sup>11</sup>
- i. a letter with attached spread-sheet of dive records, prepared by Colin McKenzie, director of Gem Pearl;<sup>12</sup>
- j. the Queensland Occupational Diving Work Code of Practice 2005;<sup>13</sup>
- k. the Tasmanian Abalone Industry Code of Practice 2002;<sup>14</sup>
- l. a user manual for Uwatec Digital 330m depth gauge;<sup>15</sup>

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<sup>5</sup> Exhibit 2(a) and 2(b)

<sup>6</sup> Exhibit 4

<sup>7</sup> Exhibit 5

<sup>8</sup> Exhibit 6

<sup>9</sup> Exhibit 7

<sup>10</sup> Exhibit 8

<sup>11</sup> Exhibit 9

<sup>12</sup> Exhibit 10

<sup>13</sup> Exhibit 11

<sup>14</sup> Exhibit 12

<sup>15</sup> Exhibit 13

- m. a pre-employment functional assessment form;<sup>16</sup>
- n. photographs of watch (depth gauge) and notes by James Paspaley;<sup>17</sup>
- o. the affidavit of Anthony Thiel dated 13 October 2015;<sup>18</sup>
- p. a hard copy of a record of interview of Anthony Thiel;<sup>19</sup>
- q. documents related to a watch (depth gauge) provided to Alex Evans;<sup>20</sup> and
- r. emails from Dr D M Moss to Sergeant Housiaux dated 5 May 2017 and 18 May 2017.<sup>21</sup>

18. Oral evidence was provided by:

- a. Water Police Diving Squad officers Senior Constable Bradley Bell,<sup>22</sup> Steve O'Meara<sup>23</sup> and Senior Constable Nikki Houston;<sup>24</sup>
- b. Joe Sinclair, a drift diver who had started at Paspaley at the same time as the deceased, and who is currently a head diver with Paspaley,<sup>25</sup>
- c. Jayde Theodore, a drift diver with Paspaley who had started at the same time as the deceased;<sup>26</sup>
- d. Julia Wiebe, a domestic worker on the Paspaley II;<sup>27</sup>

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<sup>16</sup> Exhibit 14

<sup>17</sup> Exhibit 15

<sup>18</sup> Exhibit 16

<sup>19</sup> Exhibit 17

<sup>20</sup> Exhibit 18

<sup>21</sup> Exhibit 19

<sup>22</sup> ts 5-119 per Bell, B M

<sup>23</sup> ts 119-134, 146-159 per O'Meara S F. Mr O'Meara was a police officer in 2012.

<sup>24</sup> ts 188-211, 217-231 per Houston, N E

<sup>25</sup> ts 159-188 per Sinclair, J P

<sup>26</sup> ts 253-270 per Theodore, J M

<sup>27</sup> ts 212-217 per Wiebe, J

- e. Alex Evans, a deckhand on the Paspaley II;<sup>28</sup>
- f. Jamie Hulme, the ship's engineer on the Paspaley II;<sup>29</sup>
- g. Dean Harrison, manager of occupational health and safety with Paspaley from 1999 to 2013;<sup>30</sup>
- h. Ronald Watson, skipper of the Paspaley II at the time of the deceased's death;<sup>31</sup>
- i. Anthony Thiel;<sup>32</sup>
- j. James Paspaley, Paspaley's executive director and general manager of pearling production;<sup>33</sup>
- k. Brett McCallum;<sup>34</sup>
- l. Timothy Burton, the safety and training officer at the PPA;<sup>35</sup>
- m. Dr Carl Edmonds, expert in diving medicine;<sup>36</sup>
- n. Dr James Caruso, forensic pathologist and expert in diving medicine;<sup>37</sup>
- o. Colin McKenzie, executive officer of the Association of Marine Park Tourism Operators with expertise in diving and in occupational health and safety related to diving;<sup>38</sup> and
- p. Thomas Sage, a commercial diver who was a former drift diver with Paspaley.<sup>39</sup>

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<sup>28</sup> ts 231-250 per Evans, A L

<sup>29</sup> ts 271-283 per Hulme, J R

<sup>30</sup> ts 288-354 per Harrison, D A

<sup>31</sup> ts 573-614 per Watson, R E

<sup>32</sup> ts 614-654 per Thiel, A

<sup>33</sup> ts 654-712 per Paspaley J

<sup>34</sup> ts 427-453 per McCallum, B J

<sup>35</sup> ts 453-463 per Burton, T M

<sup>36</sup> ts 362-426 per Edmonds, C

<sup>37</sup> ts 467-491 per Caruso, J

<sup>38</sup> ts 493-520 per McKenzie, C

<sup>39</sup> ts 521-563 per Sage, T W

19. Due to the apparent effects of the passage of time on the memories of some of the witnesses, where their oral evidence was inconsistent with their earlier statements, I have relied on the statements. While I also appreciate that there were opportunities for witnesses on the Paspaley II to discuss the incident at length directly after the deceased's death and thereby affect their independent recollections, I have no doubt that all eye-witnesses attempted to tell the truth as well as their memories would allow.
20. Parties were invited to make oral submissions following the evidence and to make written submissions after obtaining the transcript of the proceedings. Oral submissions were provided on 25 May 2017. On the same day, the deceased's parents and brothers addressed the Court orally.<sup>40</sup>
21. Written submissions from the parties, for which I am grateful, were received by 15 September 2017.

### **THE DECEASED**

22. The deceased was born in Sydney on 5 May 1989, making him 22 years old at the time of his death. He grew up in the eastern suburbs of Melbourne with his parents and his two younger brothers, to whom he became a mentor and role model. His family was closely knit, as was apparent by his parents' and brothers' attendance at the inquest and their oral statements to the Court.
23. The deceased was, in his father's words, a robust gung-ho child who wrestled and fought, played rollerblade hockey, AFL football, beach volleyball and every other sport known to man.<sup>41</sup> His sport of choice became beach volleyball, in which he competed at the highest

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<sup>40</sup> ts 741-745 per Mr Hampton; ts 745-746 per T Hampton; ts 746-748 per Ms Hampton

<sup>41</sup> ts 741 per Mr Hampton

level, the Australian National Championships, over five years.<sup>42</sup>

24. The deceased was also a musician and a well-adjusted, popular young man who got along with everyone and was full of life and good humour.<sup>43</sup> Testimony to his effect on others was the fact that more than 1000 people attended his funeral.<sup>44</sup>
25. The deceased attended a Montessori primary school and went on to receive his Victorian Certificate of Education at Sandringham Secondary College in 2007. He then looked for a career that would be exciting and predominantly outdoors. He loved the bush, the surf, and the wonder of nature.<sup>45</sup>

### **THE DECEASED'S DIVING BACKGROUND**

26. In January 2008 the deceased began an 18-month course at William Angliss Institute of TAFE in Melbourne to obtain a diploma in resort management, specialising in the dive industry. While involved in that course, he obtained a PADI open water instructor level certification. He completed a certificate of safety training and a certificate in pre-sea coxswain training. He also completed other courses, including emergency first response first aid instructor.<sup>46</sup>
27. From August 2009 to October 2010 the deceased worked as dive instructor and deckhand on charter boats, including two tall ship charter sailing vessels, in the Whitsunday region of Queensland. During that time he logged 306 sea days.<sup>47</sup>

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<sup>42</sup> Attachment to email from Tony Hampton to Sergeant Housiaux, 9 March 2017

<sup>43</sup> Exhibit 1, Volume 2, Tab 9; Attachment to email from Tony Hampton to Sergeant Housiaux, 9 March 2017

<sup>44</sup> Exhibit 1, Volume 2, Tab 1

<sup>45</sup> Attachment to email from Tony Hampton to Sergeant Housiaux, 9 March 2017

<sup>46</sup> Exhibit 1, Volume 1, Tab 19; Exhibit 1, Volume 2, Tab 1

<sup>47</sup> Exhibit 1, Volume 4, Tab 2; Exhibit 1, Volume 4, Letter from Corrs Chambers Westgarth to Sergeant Housiaux 4 July 2013

28. While in the Whitsunday region in 2010, the deceased also attended a maritime training facility where he obtained several further certificates related to SCUBA instruction, safety and first aid.<sup>48</sup>
29. In early 2011 the deceased travelled to Guatemala and Mexico, during which time he took part in cave diving, a high risk and technical form of diving.<sup>49</sup>

### **THE DECEASED'S SHOULDER AND PECTORALIS MAJOR**

30. In 2008 the deceased dislocated his left shoulder while playing football. After that, he had about 30 shoulder dislocations, which he would re-locate himself. He continued to experience dislocations of his shoulder when working as a dive instructor, resulting in his swimming to the surface in order to re-locate the shoulder. By May 2011 his shoulder was dislocating in his sleep.<sup>50</sup>
31. After his trip overseas in early 2011, the deceased returned to Melbourne, and on 4 July 2011 he underwent arthroscopic shoulder reconstruction. The orthopaedic surgeon who performed the operation also noted that the deceased had a deficiency of his right pectoralis major muscle.<sup>51</sup>
32. By October 2011 the deceased had nearly obtained a full range of motion in his left shoulder. The surgeon anticipated that the deceased would regain normal strength to the shoulder in four to five months after the operation if he undertook the physiotherapy program. A follow up appointment was made with the surgeon for 18 January 2012, but the deceased did not attend.<sup>52</sup>

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<sup>48</sup> Exhibit 1, Volume 2, Tab 1; Exhibit 1, Volume 1, Tab 19; Exhibit 1, Volume 2, Tab 1

<sup>49</sup> Exhibit 1, Volume 4, before Tab 1 – Letter 4/07/13 from Corrs Chambers Westgarth to Sergeant Housiaux

<sup>50</sup> Exhibit 1, Volume 1, Tab 18

<sup>51</sup> Exhibit 1, Volume 1, Tabs 15 and 16

<sup>52</sup> Exhibit 1, Volume 1, Tab 15

## **THE DECEASED JOINS PASPALEY**

33. In early 2012 the deceased successfully applied for a position as a pearl shell drift diver with Paspaley. Prerequisites for the position were: a medical examination, a Recreational Scuba Training Council-recognised SCUBA diver's open water qualification and the completion of the PPA's three-day pearl diver induction course. These requirements were stipulated by the PPA's Pearl Diving Industry Code of Practice (Code of Practice).<sup>53</sup>
34. The deceased travelled to Darwin for the medical examination and the induction course.
35. The medical examination was carried out on 14 February 2012 by a doctor with expertise in diving and hyperbaric medicine and occupational medicine. The examination included a proforma questionnaire as well as audiometry and spirometry, in accordance with AS2299.<sup>54</sup>
36. During the examination, the deceased told the doctor about the shoulder reconstruction in July 2011 and indicated that he had dived with SCUBA gear approximately 800 times.<sup>55</sup> Spirometry showed the possibility of smoking-related lung damage. X-rays of the deceased's chest, knees, hips and shoulders showed no abnormalities.<sup>56</sup>
37. The doctor certified that the deceased was medically fit for all diving except saturation diving.<sup>57</sup>
38. The deceased began his work with Paspaley on about 20 February 2012 at a shipyard in Darwin where the

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<sup>53</sup> Exhibit 1, Volume 5, Tab 1

<sup>54</sup> Exhibit 1, Volume 1, Tab 14

<sup>55</sup> Exhibit 1, Volume 1, Tab 14; The deceased stated in a PPA form on 23 February 2012 that he had completed '600+' dives: Exhibit 1, Volume 7, Tab 8. Other evidence has verified that the deceased had undertaken at least 219 dives in the Whitsunday Islands by 9 November 2010: Exhibit 10

<sup>56</sup> Exhibit 1, Volume 1, Tab 14

<sup>57</sup> Exhibit 1, Volume 1, Tab 14

Paspaley II was located. He and other divers worked on re-fitting the Paspaley II by way of painting and general maintenance.<sup>58</sup>

39. From 23 February 2012 the deceased and four other divers from Paspaley participated in the PPA's induction course, which was conducted by Mr Burton at the Paspaley office in Darwin.<sup>59</sup> Mr Burton had a background in vocational training and was a qualified diver.<sup>60</sup>
40. The induction course was not accredited, but Mr Burton had been providing it since late 2007 or early 2008.<sup>61</sup> He provided it on about a monthly basis.<sup>62</sup> The contents of the course had evolved over time to provide the participants with the key points that Mr Burton considered pertinent.<sup>63</sup>
41. The course comprised a considerable amount of theory and 14 practical tasks. The theory was provided by way of a comprehensive Power Point presentation.<sup>64</sup> Two of the practical tasks were tests of fitness; namely, swimming 200 metres in less than four minutes and treading water for five minutes upon completion of the swim.<sup>65</sup>
42. Both the theory and most of the practical tasks related to matters with which participants were expected to have been familiar from their training as divers.<sup>66</sup>
43. A practical task which would have been unusual for most participants was the use of a 'bailout bottle', which was a small compressed air tank that was carried by pearl divers as an emergency air supply.

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<sup>58</sup> Exhibit 1, Volume 2, Tab 9

<sup>59</sup> Exhibit 1, Volume 2, Tab 9

<sup>60</sup> ts 454 per Burton, T M

<sup>61</sup> ts 454 per Burton, T M

<sup>62</sup> ts 454 per Burton, T M

<sup>63</sup> ts 458 per Burton, T M

<sup>64</sup> ts 460 per Burton, T M; Exhibit 1, Volume 5, Tab 16

<sup>65</sup> Exhibit 1, Volume 7, Tab 8

<sup>66</sup> ts 458 per Burton, T M

The participants were required to demonstrate that they could change from their primary air supply to the bailout bottle and back again while under water.<sup>67</sup> The primary air supply while pearl diving was ‘surface supplied breathing apparatus’ (SSBA), popularly known as a hookah.

44. Mr Burton said that, in making a decision as to whether a participant is competent, he relies on his judgment. If a participant is inherently uncomfortable in the water, it becomes quite obvious early. It would also be unacceptable if a participant were not retaining some of the information about the physiology of diving.<sup>68</sup>
45. At the end of the induction course, the deceased satisfactorily completed all of the practical tasks and answered all of the knowledge-based questions correctly, including questions related to saltwater aspiration, barotrauma and decompression sickness.<sup>69</sup>
46. Mr Burton commented in writing on the deceased’s course records that the deceased was good in class and in water.<sup>70</sup>
47. After the induction course, the deceased and the rest of the crew boarded the Paspaley II and sailed to Broome. On the way, they carried out further training, notably bailout drills which they did in shell tanks aboard the vessel. Upon arrival in Broome the divers met the head diver, Sam Morton.<sup>71</sup>
48. As a last step before the deceased could work as a pearl shell drift diver, on 13 March 2012 he obtained a pearl diver’s licence under the *Pearling Act 1990* from the Fisheries Department.

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<sup>67</sup> Exhibit 1, Volume 7, Tab 8

<sup>68</sup> ts 460 per Burton, T M

<sup>69</sup> Exhibit 1, Volume 7, Tab 8

<sup>70</sup> Exhibit 1, Volume 7, Tab 8

<sup>71</sup> Exhibit 1, Volume 2, Tab 9

49. The crew of the Paspaley II were scheduled to commence the pearl shell diving season on 14 March 2012, but the start was delayed because of a cyclone. While they waited for the next neap tide (when pearl shell diving could take place) the divers went to Paspaley's pearl shell farm in Gourdon Bay south of Broome to help recover pearl shell which the cyclone had disturbed.<sup>72</sup> They were using similar diving techniques to those used in drift diving, as explained below.
50. The deceased remained at the pearl shell farm for eight days, during which time he did two 45 minute dives twice a day, using SSBA in the company of an experienced diver.<sup>73</sup>
51. On Thursday 12 April 2012, the Paspaley II and crew left Broome and headed south to the waters off Eighty Mile Beach in order to undertake the first drift dive of the season on the following day. The skipper of the vessel was Ron Watson.<sup>74</sup>

### **PEARL SHELL DRIFT DIVING**

52. Pearl producers carry out drift diving operations to obtain live pearl shell oysters *Pinctada Maxima*, (pearl shell or shell), subject to a quota determined by the Fisheries Department every year.<sup>75</sup>
53. Once gathered, pearl shell is transported to pearl farms where it is seeded in order to commence the creation of pearls, and it is attached to underwater panels. The shell is turned regularly to encourage the production of round pearls, to stop the shell from attaching to the ocean floor and to reduce the growth of fouling organisms on the shell.<sup>76</sup> The shell is also

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<sup>72</sup> Exhibit 1, Volume 2, Tab 13

<sup>73</sup> Exhibit 1, Volume 2, Tab 13; Exhibit 6 paras 208 and 209

<sup>74</sup> Exhibit 1, Volume 2, Tab 9

<sup>75</sup> Exhibit 1, Volume 7, Tab 4

<sup>76</sup> Exhibit 1, Volume 7, Tab 4; ts 291 per Harrison, D A

cleaned to remove fouling organisms. Panels, ropes and floats used at the farms also need to be cleaned and the hulls of vessels used in the farming process also need periodic cleaning.<sup>77</sup>

54. All of these processes at pearl farms require the involvement of divers, but the work carried out in drift diving is usually different in character from that done at the pearl farms. Whereas diving at pearl farms is done from 7.5 metre dinghies and involves a variety of tasks that can change from day to day,<sup>78</sup> drift divers are pulled behind larger vessels, and they repeatedly carry out the single task of collecting pearl shell to be taken on board the vessels.<sup>79</sup>
55. Another difference between drift diving and farm diving relates to the decompression systems used to preclude decompression sickness, systems known as dive profiles or dive tables. Drift diving uses specially designed dive tables with in-water oxygen decompression every second dive and a very slow rate of ascent. Pearl shell farm diving uses the US Navy Standard Dive Tables, with the additional safety factors of a slow ascent rate and a prohibition of any dives requiring a decompression stop of more than 10 minutes.<sup>80</sup>
56. The system of pulling drift divers through the water requires them to hold onto 50 metre ropes, or work-lines, attached to weight-lines running down to the seabed from booms extended horizontally from the sides of the vessel. Also attached to the booms are the divers' 150 metre air-lines, which supply them with compressed air from large compressors on the vessels.

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<sup>77</sup> Exhibit 1, Volume 7, Tab 4

<sup>78</sup> Exhibit 1, Volume 7, Tab 4; ts 615-616 per Thiel, A

<sup>79</sup> ts 622 per Thiel, A

<sup>80</sup> Exhibit 1, Volume 7, Tab 4

Figure 1 and Figure 2 depict drift diving.<sup>81</sup>

FIGURE 1  
OVERHEAD VIEW OF PEARL DIVING OPERATION

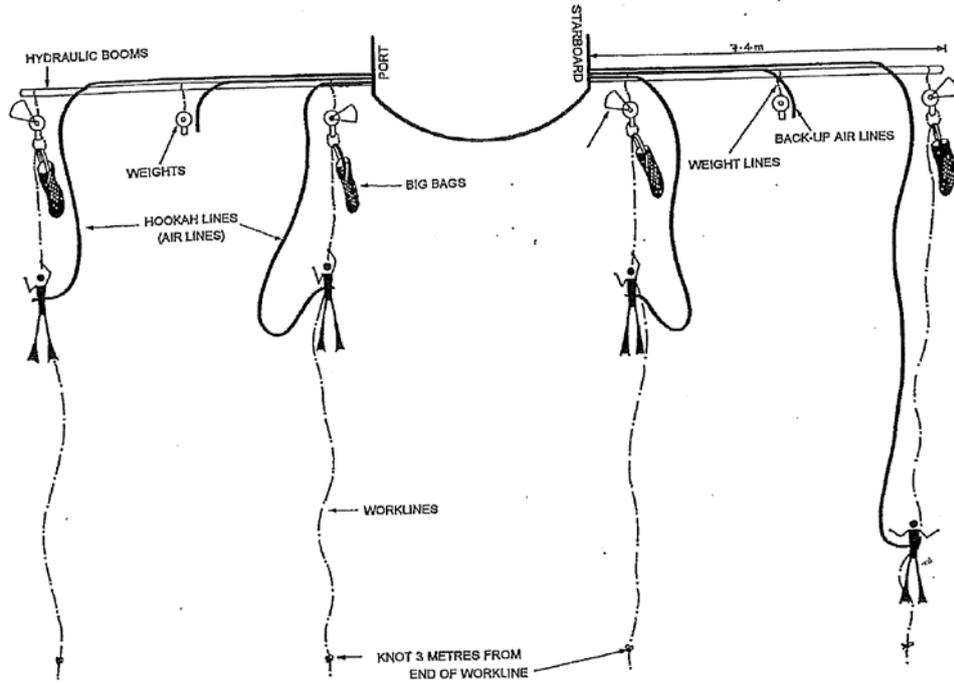
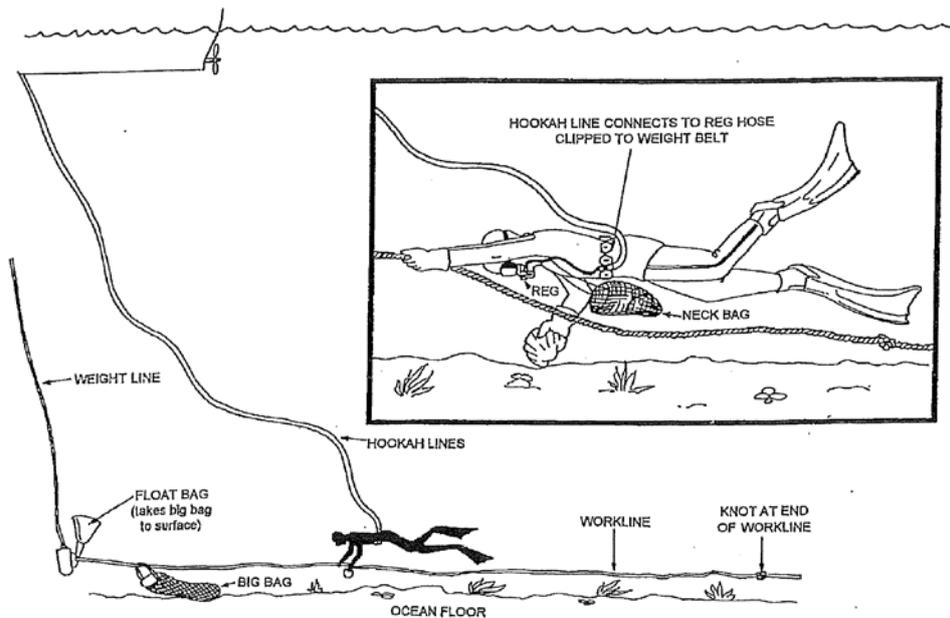


FIGURE 2  
SIDE VIEW OF PEARL DIVING OPERATION.



<sup>81</sup> Exhibit 1, Volume 1, Tab 27

57. The Paspaley II was designed and built specifically for pearl shell drift diving. It has eight weight-lines with associated air-lines, work-lines and 'big bags', which are clipped onto the weight-lines near but above the seabed. The work-lines are spaced about three metres apart and have knots at the end to let the divers know that the end is approaching. A diver on the surface at the end of his air-line could be about 100 metres behind the vessel, depending on the position of the line on the boom.<sup>82</sup>
58. On each day of diving, eight or nine dives of 45 to 60 minutes are carried out, with about a 20 minute break between dives, during which time the skipper usually moves the vessel.
59. Drift divers wear neck bags into which they place pearl shell they gather as they drift over the seabed. During the course of a dive, divers will empty the shell from their neck bags into their big bags.<sup>83</sup>
60. At the end of each dive, the big bags are lifted to the surface by winches onto the back deck of the vessel from the down-lines nearest the boat.<sup>84</sup>
61. On the back deck, the shell collected by the divers is measured, counted, cleaned, placed onto racks and submerged in tanks. During the breaks between dives, the divers eat and drink and tend to any equipment issues if necessary. They may also have to assist with cleaning the shell.<sup>85</sup>
62. As well as masks and fins, drift divers wear wetsuits, diving boots, hoods, gloves, and stinger guards for protection from irukandji jellyfish. They carry depth gauges, diving knives and weight belts, but without weights, depending on the time of the season and the

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<sup>82</sup> ts 603 per Watson, R E

<sup>83</sup> Exhibit 1, Volume 7, Tab 4

<sup>84</sup> Exhibit 1, Volume 7, Tab 4; ts 619 per Thiel, A

<sup>85</sup> Exhibit 1, Volume 1, Tab 9; ts 619 per Thiel, A

temperature of the water.<sup>86</sup> Air-lines are attached to the divers' weight belts. As noted earlier, the divers carry bailout bottles and regulators on harnesses.<sup>87</sup>

63. Drift diving takes place on neap tides, where the tidal movement is sufficiently minimal to provide for reasonable visibility under water. There are usually two neap tides every month.<sup>88</sup>
64. A drift vessel usually moves in the same direction of the tide at speeds from .8 of a knot to 1.2 knots.<sup>89</sup> Before a dive commences, a drogue is deployed to slow the vessel to about 1 knot.<sup>90</sup> To aid in the collection of pearl shell, the head diver, who also collects shell as part of the diving crew, is able to communicate with the skipper via the deckhand through a buzzer on the head diver's air-line, to indicate that the vessel's speed should increase or decrease or that the direction should change.<sup>91</sup>
65. The evidence made clear that the work of drift diving is physically demanding over the course of a day. Head diver Mr Morton said in a statement, 'We try to get in nine dives a day and by the end of the day I am exhausted. When the diving is over all I do is get a bite to eat and go to bed.'<sup>92</sup>
66. For new divers, the work is very tiring.<sup>93</sup> Mr Sage, who worked as a drift diver in the 1990's and went on to be a career commercial diver, said that '... it's the best diving I've ever done ... However, it's a long time in the water and a lot of fatigue on your hands and body ... so it's certainly something you need to build your way up to rather than being thrown in ...'.<sup>94</sup>

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<sup>86</sup> Exhibit 1, Volume 2, Tab 4

<sup>87</sup> Exhibit 1, Volume 7, Tab 4

<sup>88</sup> ts 616 per Thiel, A

<sup>89</sup> ts 636 per Thiel, A

<sup>90</sup> Exhibit 1, Volume 2, Tab 4

<sup>91</sup> Exhibit 1, Volume 2, Tab 9

<sup>92</sup> Exhibit 1, Volume 2, Tab 4

<sup>93</sup> Exhibit 6

<sup>94</sup> ts 528 per Sage, T W

67. Experienced abalone diver Mr Theodore said in oral evidence that at the end of a day he felt extremely exhausted and that the courses he had done in relation to drift diving did not sufficiently prepare him for how physical the job was. He said, 'It's almost like you should be weight training and running and doing all that sort of stuff, like, compulsorily, before you start it, in my opinion.'<sup>95</sup>
68. On the other hand, Mr Thiel, who had done drift diving and had skippered drift diving vessels for six years, agreed that drift diving was physically demanding, but he thought that characterising it as being so strenuous as to cause fatigue to the point of becoming an issue was overstating.<sup>96</sup>
69. Current Paspaley head diver Mr Sinclair said in a statement made in April 2012 that 'when you finish your ninth dive you are exhausted'. However, in a more recent, unsigned statement said, 'I am now used to the diving so it does not worry me. It is certainly quite a physical job. Your first day you are aware of the physical side and get conditioned to it. ... I have never seen a diver exhausted after a dive.'<sup>97</sup>
70. Unlike farm divers, in April 2012 drift divers did not carry buoyancy compensation devices (BCD's) or weights to adjust their buoyancy.<sup>98</sup> Instead they generally preferred to be slightly negatively buoyant to enable them to hunt for pearl shell without having to expend energy to remain on the bottom. They would hold onto their work-lines and get some uplift from their passage through the water.<sup>99</sup>
71. The evidence made it clear that drift diving is also different from other types of occupational diving in that it involves highly repetitive activities in the same general

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<sup>95</sup> ts 258 and 268 per Theodore, A L

<sup>96</sup> ts 635 per Thiel, A

<sup>97</sup> Exhibit 1, Volume 2, Tab 9

<sup>98</sup> Exhibit 1, Volume 2, Tab 4

<sup>99</sup> Exhibit 1, Volume 7, Tabs 4 and 9(b)

geographical area, with a relatively uniform sea-floor and predictable conditions. Visibility is generally good; dives are called off if visibility is overly reduced. Differences between dives are essentially limited to changes to the durations and the decompression stops of the dives, depending on the respective depths of the dives. Those changes are determined by the prescribed dive profiles.

### **DRIFT DIVING SAFETY RESPONSIBILITY**

72. On a drift diving vessel, the skipper is responsible for all people on board, including the safe operation of diving activities. The skipper carries out those responsibilities in conjunction with the head diver and the ship's engineer.<sup>100</sup>
73. The head diver is responsible for the safety and smooth running of the ship and diving operations, pre-neap checks of divers, pre-season bailout procedures, supervision of new divers, dive planning and profiles, shell grading and signalling the vessel with a buzzer on his air-line to change direction and speed while diving.<sup>101</sup>
74. There did not appear to be a formal requirement in 2012 for a person on the surface to be keeping watch over the divers while they were underwater. Mr Watson said in a statement he made in May 2017 that his understanding was that the deckhand was responsible to keep watch over divers,<sup>102</sup> but Mr Morton said unequivocally in his April 2012 statement that the deckhand was not responsible for watching the divers.<sup>103</sup>
75. The deckhand Mr Evans said in a statement that his job was to remain on the back deck during dives so that he

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<sup>100</sup> Exhibit 1, Volume 2, Tab 2

<sup>101</sup> Exhibit 1, Volume 2, Tab 2; Exhibit 1, Volume 4, Tab 6

<sup>102</sup> Exhibit 1, Volume 2, Tab 2(b)

<sup>103</sup> Exhibit 1, Volume 2, Tab 4

could answer calls (which I infer to be on the buzzer) from the divers when they are in the water.<sup>104</sup> In oral evidence he said that the duties were ‘... mainly to communicate with the head diver via Morse code.’ He had to slow the vessel or speed it up, re-set the weights for each diver and look after pearl shell after each dive.

76. However, in oral evidence, he agreed with the proposition put by Ms Archer that he was told by Mr Watson and Mr Morton that, when divers were diving, his main priority as deckhand was to keep an eye out for any divers on the surface and to alert the skipper if there were any problems.<sup>105</sup>
77. As far as I can make out, Paspaley’s standard operating procedures did not provide a requirement to maintain a watch over divers<sup>106</sup> and the PPA’s code of practice was likewise silent on the issue.<sup>107</sup>

### **DRIFT DIVING SAFETY RECORD**

78. Mr Thiel, whom I have no reason to doubt on this point, stated that to the best of his knowledge there had only been one other drift diving fatality in the pearling industry since 1974. He said that it occurred in 1989, after which hyperbaric and dive medicine specialist Dr Robert Wong led research which resulted in the development of the dive profiles specific to drift diving.<sup>108</sup>
79. The use of those profiles appears to have been instrumental in the rate of decompression sickness in drift diving being the lowest of any diving-related industry in the world. According to the PPA, in 2012 the decompression sickness rate for drift diving was

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<sup>104</sup> Exhibit 1, Volume 2, Tab 3

<sup>105</sup> ts 246 per Evans, A L

<sup>106</sup> Exhibit 1, Volume 3

<sup>107</sup> Exhibit 1, Volume 7, Tab 3

<sup>108</sup> Exhibit 6

0.015% of dives completed. From 1992 to 2016, the overall rate was 0.003% of dives completed. The acceptable tolerance levels for other dive profiles are: US Navy Tables – 2%; Construction (Caisson) Divers - 2%; DCIEM – 1.1-3.2%; Commercial divers - 0.1-0.5%; Flight Training – 0.1%.<sup>109</sup>

80. Senior Constable Houston reported that the dive tables used by the offshore oil industry work on a risk factor of 0.2% while most recreational SCUBA tables work on a risk factor of 2-4%.<sup>110</sup>
81. In addition to the extremely low rates of decompression sickness, Mr Thiel estimated that, from 1980 to 2017, 524,335 dives had been completed by 1028 divers employed by Paspaley without another incident of drowning, near drowning or a diver requiring retrieval.<sup>111</sup>
82. While the foregoing figures provide cold comfort to the deceased's family, they do support Paspaley's contentions that drift diving is not a type of high risk diving, and that Paspaley did not have a safety culture which, previous to the deceased's death, had resulted in serious diving incidents.

## **12 AND 13 APRIL 2012**

83. On 12 April 2012, the Paspaley II left Broome and travelled to the Eighty Mile Beach area to collect pearl shell for eight days.<sup>112</sup> At some stage during the day, Mr Morton visually checked the deceased's dive equipment and found no problems.
84. That evening Mr Watson and Mr Morton held a safety briefing with everyone on board. As there were several new divers, Mr Watson told them 'to take it slow, don't

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<sup>109</sup> Exhibit 1, Volume 7, Tab 24

<sup>110</sup> Exhibit 1, Volume 1, Tab 11

<sup>111</sup> Exhibit 6

<sup>112</sup> Exhibit 1, Volume 2, Tab 4

worry about how much shell is caught and to make sure that everything is done correctly.’<sup>113</sup> Mr Morton told the divers about what to expect, and encouraged them to be safe and to work together as a team.<sup>114</sup>

85. First thing the next morning, 13 April 2012, the deceased borrowed Mr Evans’ depth gauge (also known as a dive watch).<sup>115</sup> There was a query as to whether the depth gauge which the deceased’s was wearing at the time of his death was Mr Evans’, since Mr Evans said in oral evidence that he had used it after then and believed that he may have taken it back to Wales with him.<sup>116</sup> However, I am satisfied that the depth gauge was Mr Evans’ on the basis of the evidence that the depth gauge that Mr Evans lent to the deceased had been seized by police investigators<sup>117</sup> and based on the documents provided by Paspaley which show that in May 2012 Paspaley purchased a replacement depth gauge for Mr Evans.<sup>118</sup>
86. On 13 April 2012, the divers on the Paspaley carried out nine dives without incident. The deceased was positioned on the second starboard line, Line 2. Mr Morton was beside him on the first starboard line in order to allow Mr Morton to observe him. Mr Morton stated that he kept an eye on the deceased, that he was impressed with his diving, and that he appeared confident in the water. Later in the day, Mr Morton passed along his observations to Mr Watson.<sup>119</sup>

## **14 APRIL 2012 – FIRST SEVEN DIVES**

87. On the following morning, the deceased was moved to Line 3 on the starboard side to allow another new diver to work next to Mr Morton. To the right of the deceased

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<sup>113</sup> Exhibit 1, Volume 2, Tab 2

<sup>114</sup> Exhibit 1, Volume 2, Tabs 2, 2(b) and 6

<sup>115</sup> Exhibit 1, Volume 2, Tab 3

<sup>116</sup> ts 239 per Evans, A L

<sup>117</sup> Exhibit 1, Volume 1, Tab 10

<sup>118</sup> Exhibit 18

<sup>119</sup> Exhibit 1, Volume 2, Tabs 2 and 4

on Line 4 was an experienced diver, Shane Stanford.<sup>120</sup> The dive profiles for decompression stops were to be the same as for the previous day. Prior to the first dive, Mr Morton spoke to the deceased to check that he had felt comfortable in the water on the previous day, and the deceased said that he was comfortable and ready to go.<sup>121</sup>

88. The first seven dives of the day proceeded without incident, except for the following circumstances.
89. In one dive, the deceased lost his work-line in poor visibility when he was taking his big bag to Line 1. The poor visibility was caused by what was called a mud monster, a phenomenon involving an area of severely reduced visibility due to a disturbance of mud and silt on the sea floor.<sup>122</sup>
90. Determining the specific dive during which that incident occurred is somewhat problematic because the evidence obtained from the crew members of the Paspaley II in April 2012 was inconsistent.
91. Mr Watson stated that it occurred about 45 minutes into the fourth dive after Mr Morton had called off the dive due to low visibility.<sup>123</sup>
92. Mr Morton stated that the incident occurred near the end of the second dive. Mr Morton said that all of the divers except the deceased swam to his line with their big bags so that they could be winched to the surface. He went to the deceased's down-line and work-line but could not find him. Mr Morton then did a five-minute oxygen decompression and went to the ladder, from where he could see the deceased's bubbles as he was working his way back to the vessel on the fourth work-

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<sup>120</sup> Exhibit 1, Volume 2, Tabs 2 and 12

<sup>121</sup> Exhibit 1, Volume 2, Tab 4

<sup>122</sup> ts 57 per Bell, B M

<sup>123</sup> Exhibit 1, Volume 2, Tab 2

line. Mr Morton then swam to the deceased and signalled him to do his oxygen decompression.<sup>124</sup>

93. When the deceased got back on the vessel after his oxygen decompression, he told Mr Morton about getting lost in a mud monster, and he commented that making his way back by swimming up his air-line to a work-line was hard work. Mr Morton told him that he had done the right thing and did not panic. He explained that in future he could go up his down-line until the visibility improved and then move across the lines. The deceased agreed to do so.<sup>125</sup>
94. None of the other divers mentioned in their statements that they had experienced a mud monster, though Mr Theodore stated, 'The dive before the 8<sup>th</sup>, so the 7<sup>th</sup> dive, I heard Jarrod complaining about the visibility in the water. It was really bad, you could hardly see your hand in front of your face.' It is not clear from that statement alone whether Mr Theodore meant that he heard the deceased complaining after the seventh dive about the seventh dive or about an earlier dive. Nor is it clear whether the sentence beginning 'It was really bad' was what the deceased told him or was his own recollection of the conditions.<sup>126</sup>
95. In oral evidence Mr Theodore confirmed the earlier statement and, arguably, clarified it to mean that the dive with poor visibility was the seventh dive.<sup>127</sup> He went on to agree that the dive in which the deceased lost his work-line was the one in which there was a mud monster and that, as far as he remembered, there was only one dive with a mud monster that day.<sup>128</sup>
96. Mr Theodore stated that the deceased said that he nearly drowned when he took his net bag over to the big bag and could not find it due to the visibility. When

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<sup>124</sup> Exhibit 1, Volume 2, Tab 4

<sup>125</sup> Exhibit 1, Volume 2, Tab 4

<sup>126</sup> Exhibit 1, Volume 2, Tab 10

<sup>127</sup> ts 256 and 261 per Theodore, J M

<sup>128</sup> ts 261 and 265-266 per Theodore, J M

Mr Theodore assumed that he was joking and laughed at him, the deceased did not seem to laugh back.<sup>129</sup>

97. Mr Evans said in his statement that on about the seventh dive he remembered seeing the divers' air hoses come into their oxygen hang-off area about 10 metres from the vessel where the divers would conduct an oxygen decompression, but that the deceased's air-line was extended. He said that the deceased corrected the problem himself in a minute or two. The deceased later told everyone that he had lost his work-line and was laughing about it, apparently genuinely.<sup>130</sup> In oral evidence, Mr Evans remembered that it was the sixth dive.<sup>131</sup>
98. The inconsistency of the eyewitness evidence led, not surprisingly, to a suggestion that the deceased may have lost his work-line twice in the first seven dives: the second or the fourth dive and the sixth or seventh dive.
99. However, in my view the preponderance of evidence indicates that there was only one incident. In particular, Mr Evan's evidence of the circumstance of the incident as told to him by the deceased coincides with Mr Morton's statement and with Mr Theodore's evidence that there was only one dive with a mud monster that day.
100. As to which dive it was, the evidence is more equivocal. A dive log kept by Mr Watson shows that the fourth dive was 40 minutes in duration, which was 10 minutes shorter than each of the second, third, fifth and sixth dives, so corroborated his evidence that the fourth dive was cut short by Mr Morton due to poor visibility.<sup>132</sup>
101. However I note, as I will explain in greater detail below, that the depth gauge worn by the deceased showed an

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<sup>129</sup> Exhibit 1, Volume 2, Tab 10

<sup>130</sup> Exhibit 1, Volume 2, Tab 3

<sup>131</sup> ts 241 per Evans, A L

<sup>132</sup> Exhibit 1, Volume 1, Tab 10

extended dive time and an ascent alarm for the second dive, indicating the deceased ascended at a rate exceeding, on my calculations, 9.9 metres per minute<sup>133</sup> when the prescribed ascent rate was 3 metres per minute.<sup>134</sup> It is possible that the deceased's rapid ascent indicated by the depth gauge related to the incident in question.

102. The sixth dive can be excluded because of consistent evidence that the deceased only lost his work-line once in poor visibility, and the lack of any evidence, apart from Mr Evans', of any knowledge of the deceased having any problems on that dive.
103. As to the seventh dive, it can be excluded as it was not a dive with the oxygen stop mentioned by Mr Evans and because the time appearing in the log book was, on Mr Watson's evidence, consistent with the profile for that dive.<sup>135</sup>
104. In the end, it remains unclear as to whether the deceased lost his work-line on the second dive or the fourth dive, but the evidence made clear that all the other first seven dives that day proceeded without incident. Mr Sinclair noted in an un-dated statement, which he apparently signed shortly before the inquest,<sup>136</sup> that he did not remember the deceased showing any signs of fatigue on that day, and that there was nothing to indicate that the deceased was more tired than the other divers.<sup>137</sup>

## **EVENTS LEADING TO DEATH**

105. The planned second last dive of the day, the eighth dive, on 14 April 2012 commenced at 3.25 pm that afternoon. Mr Evans stated that, during the break

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<sup>133</sup> Exhibit 15; Supplementary Statement of Anthony Thiel, Attachment AT-6

<sup>134</sup> Exhibit 1, Volume 7, Tab 3, p. 51

<sup>135</sup> ts 613 per Watson, R E

<sup>136</sup> ts 182 per Archer, G

<sup>137</sup> Exhibit 1, Volume 1, Tab 9; ts 184 per Sinclair, J P

before the dive, the deceased had a protein shake and was in good spirits, laughing and joking as usual.<sup>138</sup>

106. There was a possibility that the dive would go to more than 13 metres in depth, so there was a plan to have a 10 minute oxygen decompression stop instead of a five minute stop. The visibility was good and there were no mud monsters. The deceased was on Line 3 on the starboard side of the Paspaley II next to Shane Stanford on Line 4.<sup>139</sup>
107. At about 20 to 25 minutes into the dive, Mr Stanford noted that the deceased was swimming about three metres away from him. Everything looked normal and the deceased did not appear to be in any difficulty. Mr Stanford swam away from him to give him more room.<sup>140</sup>
108. Mr Evans stated that, at about 30 minutes into the dive, he received a buzzer signal from the diver on Line 1 on the port side directing him to reset the down weights. He quickly turned on the winch and started resetting the weights. As he did so, he heard someone shout over the noise of the machinery. He turned off the winch in order to hear better, but could not see or hear anything.<sup>141</sup>
109. Ms Wiebe, the domestic worker on the Paspaley II, was nearby so Mr Evans asked her if she could hear anything. After a few seconds, he and Ms Wiebe heard another shout which was difficult to make out, but which Mr Evans assumed was something like 'help' or 'stop'. He could see the deceased in the distance at the end of his airline, though at that stage he did not know who it was.<sup>142</sup>

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<sup>138</sup> Exhibit 1, Volume 2, Tab 3

<sup>139</sup> Exhibit 1, Volume 2, Tab 4

<sup>140</sup> Exhibit 1, Volume 2, Tab 12

<sup>141</sup> Exhibit 1, Volume 2, Tab 3

<sup>142</sup> Exhibit 1, Volume 2, Tab 3

110. Ms Wiebe stated that she saw a diver surface twice and signal with his hands and she thought that she heard him shout for help twice.<sup>143</sup>
111. Mr Evans stated that he assumed the worst because he knew that, if the deceased could shout, his regulator would not be in his mouth. He ran to the intercom on the back deck to tell Mr Watson in the wheelhouse that someone was shouting for help. Without waiting for a response, he ran to the wheelhouse and told Mr Watson the same thing. He then ran back to the back deck to keep a lookout, but did not see anything more. Seconds later, Mr Watson arrived at the back deck and told him to ‘bang the divers up’, meaning to call off the dive by tapping on the side ladder. Mr Evans then did so.<sup>144</sup>
112. Mr Watson’s evidence is somewhat inconsistent with that of Mr Evans and Ms Wiebe. He stated that, after he got a call from Mr Evans saying a diver was up, he went down to the port side to the back deck and asked Mr Evans where the diver was. Mr Evans pointed to him about 40 metres off the stern. Mr Watson saw him and thought that he looked okay. He signalled to him to pull himself back. The diver then went back down.<sup>145</sup>
113. Mr Watson stated that he asked Mr Evans what had happened and Mr Evans said that he thought he heard the diver yell ‘Help’. Mr Watson then put the drogue in the water to slow the vessel right down. He did not stop the vessel because if it did not continue moving forward, the air-lines could foul the vessel and create a hazard. He then banged the divers up.<sup>146</sup> That there were two bang-up signals accords with Mr Stanford’s statement.<sup>147</sup>
114. Mr Watson stated that he then went back to the wheelhouse in order to mark the vessel’s position on the

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<sup>143</sup> Exhibit 1, Volume 2, Tab 7

<sup>144</sup> Exhibit 1, Volume 2, Tab 3

<sup>145</sup> Exhibit 1, Volume 2, Tab 2

<sup>146</sup> Exhibit 1, Volume 2, Tab 2

<sup>147</sup> Exhibit 1, Volume 2, Tab 12

course plotter in case the deceased was adrift, and to grab his binoculars. He said that he went to the back deck and could see that the deceased's air-line was tight as if he were pulling himself up the air-line, but he was worried that something was not right.<sup>148</sup>

115. At about this time Mr Hulme, the ship's engineer, came onto the back deck because he had heard the bang up signal and had thought that it was too early for the divers to be coming up. Mr Watson told him that one of the divers was in trouble, but he could not see anyone. Mr Hulme lowered the oxygen regulators down to the divers for their decompression stop.<sup>149</sup>
116. Mr Watson instructed Mr Evans to go onto the boom and to pull in the deceased's air-line.<sup>150</sup>
117. Mr Evans pulled in the air-line as instructed until he could see the deceased on the surface about 10 metres from the vessel. The deceased still had his neck bag on. His air-line was tangled around one leg and one of his fins was missing.<sup>151</sup>
118. When Mr Watson saw the deceased behind the vessel, he jumped in and swam to him. He grabbed the deceased by the wetsuit, but Mr Watson had no fins and it was difficult to swim back to the boat with him. Mr Hulme also jumped in to assist Mr Watson, and they started towing the deceased back to the vessel.<sup>152</sup>
119. Meanwhile, the other divers were responding to the bang-up signal to call off the dive. Mr Morton stated that he heard the banging at 35 minutes into the dive. He swam up to his big bag and the two other divers on the starboard side also came to Line 1 with their big bags, but the deceased was missing. He swam to the deceased's down-line and tugged on the work-line but

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<sup>148</sup> Exhibit 1, Volume 2, Tab 2

<sup>149</sup> Exhibit 1, Volume 2, Tab 6

<sup>150</sup> Exhibit 1, Volume 2, Tab 2

<sup>151</sup> Exhibit 1, Volume 2, Tab 3

<sup>152</sup> Exhibit 1, Volume 2, Tab 6

could feel no weight on it. He assumed that the deceased had gone up his air-line again and that this was the reason why the dive had been called off.<sup>153</sup>

120. Mr Morton went back to the big bags to signal for them to be winched and, once they started to go up, went to the oxygen hang-off on Line 2 to commence a 10 minute decompression. After eight minutes he noticed a tangle of air-lines above him, so he left the decompression stop and went to the surface. He then saw Mr Watson and Mr Hulme towing the deceased towards the vessel. The deceased was unconscious, and they were trying to keep his head above the water.<sup>154</sup>
121. Mr Morton assisted Mr Watson and Mr Hulme. He hooked his arm under the deceased's bailout harness and towed him to the ladder as quickly as he could. He pulled the deceased onto him and kept his head above water while taking off his gear and handing it to the people on the deck. The deceased's neck bag had about 15 shells in it.<sup>155</sup>
122. Mr Morton took off the deceased's bailout harness and bottle and tried to hand the deceased up the ladder, but the people on the deck could not get a grip on the deceased, so Mr Morton put the harness back on him and they dragged him up the ladder with some difficulty.<sup>156</sup>
123. Once the deceased was on the deck, Mr Watson administered CPR until Mr Morton took over. Tom Kelly, a Paspaley employee who had come to assist in a dump boat from another Paspaley vessel, the MV Clare, also assisted.<sup>157</sup>
124. Mr Watson then went to the wheelhouse and used a satellite phone to call Paspaley's occupational health

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<sup>153</sup> Exhibit 1, Volume 2, Tab 4

<sup>154</sup> Exhibit 1, Volume 2, Tab 4

<sup>155</sup> Exhibit 1, Volume 2, Tab 4

<sup>156</sup> Exhibit 1, Volume 2, Tab 4

<sup>157</sup> Exhibit 1, Volume 2, Tab 4

and safety manager in Darwin, Dean Harrison, to seek advice. Mr Harrison advised him to prepare surface oxygen and an Epipen (adrenaline) but not to administer either until Mr Harrison received authority from a medical officer.<sup>158</sup>

125. Mr Harrison called Dr Wong, who at the time of the call was at a café in Claremont.<sup>159</sup>
126. Mr Harrison gave Dr Wong some relevant details about the deceased's situation and asked for advice. Dr Wong asked him to have Mr Watson contact him directly to enable him to ascertain the situation and to direct Mr Watson accordingly.<sup>160</sup>
127. Mr Harrison called Mr Watson back and provided him with Dr Wong's phone number.<sup>161</sup>
128. Mr Watson called Dr Wong about 30 minutes later. In answer to his questions, Mr Watson told him that the deceased had been retrieved from the water after 10 to 20 minutes and that CPR had been performed for about 30 minutes. Dr Wong advised him to use the Epipen and oxygen, to continue the CPR and to let him know how the resuscitation progressed.<sup>162</sup>
129. About 15 minutes later, Mr Watson called Dr Wong again and advised that the deceased had no carotid pulse after CPR with oxygen and adrenaline. Dr Wong advised him to cease CPR, which then occurred.<sup>163</sup>
130. On the advice of Mr Harrison,<sup>164</sup> Mr Watson arranged for Mr Kelly to bring a body bag to the Paspaley II from the MV Clare, and Mr Watson and Mr Hulme put the deceased's body in the bag for transport back to Broome on the deck of the Paspaley II. The vessel then sailed

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<sup>158</sup> Exhibit 1, Volume 2, Tab 2

<sup>159</sup> Exhibit 1, Volume 2, Tab 17

<sup>160</sup> Exhibit 1, Volume 2, Tab 17; Exhibit 1, Volume 6, Tab 1; ts 296 per Harrison, D

<sup>161</sup> Exhibit 1, Volume 6, Tab 1; ts 296 per Harrison, D

<sup>162</sup> Exhibit 1, Volume 2, Tab 17

<sup>163</sup> Exhibit 1, Volume 2, Tab 17

<sup>164</sup> Exhibit 1, Volume 6, Tab 1

for about seven hours to Broome, where it was met by police officers who took the deceased's body and his diving equipment into possession.<sup>165</sup>

131. The police officers took the deceased's body to the Broome District Hospital where it was placed in the mortuary before being transferred to the State Mortuary in Perth for a post mortem examination.<sup>166</sup>

132. It seems clear that the deceased's body did not undergo a CT scan while at Broome District Hospital.

### **CAUSE OF DEATH**

133. As discussed below, it is apparent that the deceased died from drowning. However, that conclusion does not explain the event or events which precipitated the drowning.

### **Post mortem examination**

134. On 19 April 2012 forensic pathologist Dr D M Moss conducted a post mortem examination and found heavy fluid-laden lungs and a small amount of frothy fluid in the upper airways. He found no evidence of injury or natural disease to account for death. He noted that there was an absence of much of the pectoralis major muscle on the right side of the chest, apparently as a result of a congenital abnormality.<sup>167</sup>

135. During Dr Moss' examination of the heart, he opened the left atrium under water and noted that several large bubbles of gas came out, but that there were no definite large quantities of froth within the left side of the heart. He noted apparent gas bubbles in the epicardial veins, but the epicardium was otherwise unremarkable.<sup>168</sup>

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<sup>165</sup> Exhibit 1, Volume 2, Tab 6

<sup>166</sup> Exhibit 1, Volume 1, Tab 12

<sup>167</sup> Exhibit 1, Volume 1, Tab 6

<sup>168</sup> Exhibit 1, Volume 1, Tab 6

136. A CT scan of the head, chest and abdomen was performed at Sir Charles Gairdner Hospital (since the State Mortuary did not have a CT scanner), but it was not reported by a consultant radiologist. Unlike the situation with clinical patients at the hospital, the results of the scan were not placed onto the electronic system. Instead, they were placed onto a CD or DVD, which was subsequently lost without being copied. Despite extensive searches, it was not found.<sup>169</sup>
137. On 21 June 2012 Dr Moss reported that microscopic examination of tissues showed some early post mortem changes and excess fluid in the lungs, but there were no other significant abnormalities that would have had a bearing on the death. Toxicological analysis showed no evidence of alcohol, common medications or common drugs of abuse. Neurological examination of the brain showed cerebral congestion but no other abnormalities.<sup>170</sup>
138. Dr Moss concluded that the cause of death was: 'consistent with drowning'.
139. In a letter dated 13 May 2013 to then State Coroner Alastair Hope, Dr Moss explained that the results of the CT scan were not reviewed by a radiologist because the only radiologist available did not consider that he or she had sufficient experience in post mortem imaging to provide a reliable opinion, particularly in relation to possible findings of intravascular gas.
140. In the letter, Dr Moss also explained that, in diving deaths, the possibility of intravascular gas due to complications of the dive, namely pulmonary barotrauma leading to gas emboli, especially cerebral artery gas emboli, is very difficult to identify in a post mortem examination. CT scanning is superior; however, from 8 hours after death, post mortem changes can significantly inhibit the usefulness of

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<sup>169</sup> Exhibit 1, Volume 1, Tab 6

<sup>170</sup> Exhibit 1, Volume 1, Tab 6

scans, and post mortem gas formation by bacteria can make the scans virtually impossible to interpret. Pathologists still do the scans, but with the caveat that, the longer the time interval between death and the scanning, the less reliable any findings would be.

### **Expert witnesses**

141. Dr Caruso, Chief Medical Examiner of Denver, Colorado is a forensic pathologist as well as a diving and hyperbaric medicine specialist who had been commissioned by Paspaley to review the circumstances of the deceased's death and to provide a report.<sup>171</sup> I am satisfied that Dr Caruso has considerable experience and expertise in his fields and that he is eminently qualified to provide an expert opinion on the cause of the deceased's death. I found him to be an objective and compelling expert witness.
142. Dr Caruso agreed with Dr Moss that the deceased died from drowning, but he considered that, given that the deceased was young and healthy and had over 600 dives to his credit yet drowned with a spare gas bottle, more explanation was required.<sup>172</sup>
143. Dr Caruso considered that the circumstances leading up to the deceased's death, in particular that the deceased surfaced after an apparent rapid ascent and then shouted before going back below the surface, was characteristic of an air embolism.<sup>173</sup> Dr Caruso's view was supported, he said, by Dr Moss' finding of intracardiac gas in the left atrium and not in other areas of the heart.<sup>174</sup> He concluded that the deceased drowned after the air embolism and that the cause of death was drowning secondary to incapacitation by an air embolism.<sup>175</sup>

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<sup>171</sup> Exhibit 2

<sup>172</sup> ts 477 per Caruso, J

<sup>173</sup> Exhibit 2; ts 471-473, 488 per Caruso, J

<sup>174</sup> Exhibit 2; ts 475-477, 488 per Caruso, J

<sup>175</sup> Exhibit 2; ts 490 per Caruso, J

144. Air embolism can occur following an over-expansion of air in a diver's lungs when a diver ascends without exhaling. It is a well-recognised risk of diving with compressed air. Dr Caruso explained that the greatest risk of over-expansion injury, or pulmonary barotrauma, occurs while ascending the final metre or two of depth to the surface.<sup>176</sup> Pulmonary barotrauma causes air embolism which can lead to cerebral arterial gas embolism (CAGE), which is effectively a stroke.<sup>177</sup>
145. Dr Caruso said that an air embolism can be immediately incapacitating with catastrophic cardiovascular collapse, or it can take a few minutes to manifest itself. For that reason, his conclusion that the deceased had experienced an air embolism would not be affected if the deceased had made two calls for help.<sup>178</sup>
146. Dr Caruso thought that it was a likely possibility that, after coming off his work-line for the second time that day and struggling to return to it, the deceased panicked and had a poorly controlled and rapid ascent to the surface.<sup>179</sup> He believed that the deceased may have bitten off the lugs in his mouthpiece during a seizure at the time he died or as a result of panic.<sup>180</sup> He noted the evidence of Mr Evans that the deceased appeared to surface at the end of his air-line, and stated that, if true, the deceased would not likely have been in control of his ascent at that time.<sup>181</sup>
147. Dr Wong, who as noted is an experienced diving and hyperbaric medicine specialist with long association with pearl drift-diving, reviewed Dr Moss' and Dr Caruso's reports. He agreed entirely with Dr Caruso and opined that CAGE was the likely outcome of the deceased coming off his work-line, which led to drowning.<sup>182</sup>

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<sup>176</sup> Exhibit 2; ts 470-472 per Caruso, J

<sup>177</sup> Exhibit 2; ts 387 per Edmonds, C; ts 470-472 per Caruso, J

<sup>178</sup> ts 472 per Caruso, J

<sup>179</sup> Exhibit 2

<sup>180</sup> Exhibit 2

<sup>181</sup> Exhibit 2

<sup>182</sup> Exhibit 1, Volume 2, Tab 17C

148. I should note that, although Dr Wong is not a forensic pathologist, he was critical of Dr Moss' report, especially the lack of information following the performing of a CT scan.<sup>183</sup> Dr Moss' written explanations in relation to Dr Wong's criticisms satisfy me that the criticisms were misplaced in that they were based on incorrect assumptions about the autopsy performed by Dr Moss and the difficulties associated with it due to matters outside Dr Moss' control.<sup>184</sup>
149. Dr Moss noted that he, Dr Caruso and Dr Wong all agreed that drowning was the final mechanism of the deceased's death, and he agreed that gas embolism was the most likely cause of the incapacitation that led to the drowning.<sup>185</sup>
150. Dr Edmonds, whom I mentioned in the Introduction above, is another eminent authority on diving and hyperbaric medicine. While not a forensic pathologist, he has published several texts on diving medicine and has been the author of many research reports and reviews on the investigation of diving accidents. He has received several awards for his contributions to diving safety, including a Medal of the Order of Australia in 2008.<sup>186</sup>
151. Dr Edmonds has also published papers relating to pearl diving and at least one review article on modifications to the investigation of diving-related deaths, that paper being one which he co-authored with Dr Caruso in 2014.<sup>187</sup> He has also collaborated with Dr Caruso on autopsies related to diving.<sup>188</sup>
152. I have no hesitation in accepting that Dr Edmonds is suitably qualified to provide expert evidence on the cause and circumstances of the deceased's death. I do

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<sup>183</sup> Exhibit 1, Volume 2, Tab 17C

<sup>184</sup> Exhibit 19A and 19B

<sup>185</sup> Exhibit 19A and 19B

<sup>186</sup> Exhibit 1, Volume 2, Tab 18

<sup>187</sup> Exhibit 1, Volume 2, Tab 18

<sup>188</sup> ts 370 per Edmonds, C

not accept Paspaley's submission that Dr Edmonds was not an independent expert. He certainly made a spirited defence of his opinions, but that hardly indicates a lack of independence, in my view. To some extent, it appears to me that Paspaley's submission failed to take into account Dr Edmonds stated assumption and the qualifications he made to his conclusions.

153. Dr Edmonds was asked by the Court to provide a report commenting on, among other things, how the death occurred and any other relevant matter that may assist the coroner. He provided a report in which he described what he understood of the incident from the evidence provided to him. He said that the deceased had two incidents before his last dive: one on the previous day and the other on the seventh dive of 14 April 2012 as reported by Mr Evans.<sup>189</sup>
154. Dr Edmonds understood that the deceased surfaced on the eighth dive and was on the surface for sufficient time to record separate dives for the eighth and ninth dives on the depth gauge (that is, at least five minutes) before sinking to 9.1 metres, possibly due to unconsciousness due to hypoxia from salt water aspiration. More than 10 minutes later, the deceased was dragged underwater by his air-line until he surfaced near the boom, and he was eventually retrieved onto the Paspaley II.<sup>190</sup>
155. Dr Edmonds concluded that the deceased got into trouble during the eighth dive, probably related to the aspiration of sea water, and that when he sank to 9.1 metres, he was possibly unconscious due to aspiration.<sup>191</sup>
156. Dr Edmonds commented in an annotated copy of his report that the autopsy findings did not provide

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<sup>189</sup> Exhibit 1, Volume 2, Tab 18

<sup>190</sup> Exhibit 1, Volume 2, Tab 18

<sup>191</sup> Exhibit 1, Volume 2, Tab 18

evidence to support the presence of decompression sickness, post mortem decompression artefact or decomposition. In particular, he went on to say that there was not 'sufficient evidence to incriminate the possibility of pulmonary barotrauma, from the presence of surgical emphysema, pneumothorax or air embolus.'<sup>192</sup>

157. Dr Edmonds stated that the bitten off lugs of the regulator mouthpiece 'could be either the cause or effect of salt water aspiration, leading to death by drowning.' 'Alternately', he stated, 'if there was aspiration, this causes hypoxia and buccal (masseter) spasm – likely to cause the lugs to be bitten off.'<sup>193</sup>
158. In oral evidence, Dr Edmonds supported his conclusion that salt water aspiration contributed to the deceased's death from drowning by referring to Mr Theodore's evidence of the deceased saying before the eighth dive that he had nearly drowned. That statement implied that the deceased had probably taken in a little bit of seawater into his lungs, Dr Edmonds said. That predisposed the deceased to risk in the eighth dive because he was already exhausted and would have had some degree of hypoxia, so was already very vulnerable.<sup>194</sup>
159. It is also important to note that, in oral evidence, Dr Edmonds reiterated his understanding that the deceased stayed on the surface for over five minutes before submerging for seven minutes.<sup>195</sup>
160. When Sergeant Housiaux asked Dr Edmonds to comment on Dr Caruso's view that the deceased died from drowning secondary to an air embolism, Dr Edmonds said that it was always a possibility, but that it was unlikely because the autopsy showed a pleural effusion but no pneumothorax, mediastinal

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<sup>192</sup> Exhibit 1, Volume 2, Tab 18

<sup>193</sup> Exhibit 1, Volume 2, Tab 18

<sup>194</sup> ts 364 per Edmonds, C

<sup>195</sup> ts 365 per Edmonds, C

emphysema or air emboli in the brain, which are part of an air embolism (which he called burst lung). He said that these findings did not mean that a burst lung did not happen, but that there was an enormous amount of evidence for drowning.<sup>196</sup>

161. When those views of Dr Edmonds were put to Dr Caruso, he said that, if an autopsy takes place five days after death, without post mortem imaging it is extremely difficult to make a diagnosis of air embolism and that there are a lot of cases of air embolism without gross evidence of pulmonary barotrauma. However, the gas in the left atrium and not in other parts of the heart made him suspicious of air embolism and the rapid ascent followed by calling out and losing consciousness support the finding of air embolism.<sup>197</sup>
162. Ms Archer asked Dr Edmonds if he agreed that five days after a death from air embolism you may not see surgical emphysema or pneumothorax, and he replied that you may see them. When asked to clarify his answer, Dr Edmonds agreed that you may or may not see them and that, if it was a very small pneumothorax for example, he could imagine it being absorbed.<sup>198</sup>
163. Dr Edmonds agreed that a diver who surfaces and calls out is conscious at the time, and that if the diver goes back under the water without seeking alternative sources of air, the diver is unconscious at that point. He also agreed that a diver who loses consciousness on, or shortly after, surfacing has experienced an air embolism until proven otherwise, providing that the loss of consciousness occurred within the first minute or two (my emphasis).<sup>199</sup>
164. In a later exchange with Ms Archer, Dr Edmonds said that a history of a diver coming to the surface, crying out and then losing consciousness was consistent with

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<sup>196</sup> ts 371 per Edmonds, C

<sup>197</sup> ts 475 and 477 per Caruso, J

<sup>198</sup> ts 420 per Edmonds, C

<sup>199</sup> ts 380 per Edmonds, C

an arterial embolism, but was not characteristic only of an arterial embolism since it is characteristic of other things.<sup>200</sup>

165. When asked about the statement in a guideline published by the Royal College of Pathologists of Australia to the effect that a history of a diver coming to the surface rapidly, crying out and then losing consciousness within minutes was characteristic of pulmonary barotrauma,<sup>201</sup> Dr Edmonds said that the statement was very reasonable, given the authors, but that it was not conclusive since the symptom is also present in other illnesses.<sup>202</sup>
166. I also note that, in the review article Dr Edmonds co-authored with Dr Caruso mentioned above, he indicated that a history of rapid ascent followed by unconsciousness was strongly supportive of a pulmonary barotrauma origin for a gas embolism.<sup>203</sup>
167. As to whether he would agree that if a diver made a rapid ascent and suffered an air embolism, the diver was not killed by salt water aspiration, Dr Edmonds said that he would not know, because it would not be known what caused the diver to do the rapid ascent; it could well have been salt water aspiration.<sup>204</sup>
168. Dr Edmonds agreed that an arterial embolism can cause a seizure and that if a diver has bitten off the lugs of a mouthpiece, a hypoxic spasm or a seizure would be a reasonable assessment. He also agreed that a diver would not enter the water with a mouthpiece with missing lugs.<sup>205</sup>

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<sup>200</sup> ts 383-384 per Edmonds, C

<sup>201</sup> Exhibit 1, Volume 1, Tab 20, Fact File Number 2/2003, The Royal College of Pathologists of Australia, Autopsy & the Investigation of Scuba Diving Fatalities, p.3

<sup>202</sup> ts 387-388 per Edmonds, C

<sup>203</sup> Edmonds C, Caruso JL Diving fatality investigations: recent changes *Diving and Hyperbaric Medicine*, Volume 44 No. 2 June 2014, pp 91-96 at 94

<sup>204</sup> ts 390 per Edmonds, C

<sup>205</sup> ts 389-390 per Edmonds, C; see also ts 479 per Caruso, J

169. The difference in opinion between Dr Caruso and Dr Edmonds may be explained by their different respective assumptions about the circumstances of the deceased's surfacing and then submerging, particularly in relation to the issue of the length of time during which the deceased stayed on the surface.
170. The two aspects of evidence relevant to that issue are the accounts of eye-witnesses, which I have addressed above, and the evidence related to the depth gauge worn by the deceased that day.

### **Depth gauge**

171. Senior Constable (now Mr) O'Meara examined and tested the deceased's diving equipment and prepared a report. He stated that he tested the equipment at the anchorage of the Paspaley II in Broome. The test was carried out at the surface for five minutes and in-water for 18 minutes. He had found the equipment to be serviceable, except for the lugs in the mouthpiece of the second stage regulator for the SSBA, which had been bitten off.<sup>206</sup>
172. Senior Constable O'Meara noted that there were two 'dive watches' (depth gauges) attached to the deceased's neck bag: one belonging to the deceased and the other belonging to Mr Evans. He noted that the deceased's depth gauge was unserviceable as it had no power. He reported that Mr Evan's depth gauge recorded that the last nine dives were as shown in the following table in ascending order, with the most recent dive as number 1:<sup>207</sup>

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<sup>206</sup> Exhibit 1, Volume 1, Tab 10

<sup>207</sup> Exhibit 1, Volume 1, Tab 10

| Dive # | Maximum Depth<br>(Metres) | Time<br>(Minutes) |
|--------|---------------------------|-------------------|
| 1      | 9.5                       | 7                 |
| 2      | 16.1                      | 47                |
| 3      | 14.4                      | 57                |
| 4      | 15.5                      | 64                |
| 5      | 12.6                      | 53                |
| 6      | 13.3                      | 61                |
| 7      | 13.1                      | 56                |
| 8      | 12.6                      | 61                |
| 9      | 14.2                      | 48                |

173. Senior Constable O'Meara understood that dive number 2 was the dive in which the deceased surfaced and called for help, and that dive number 1 occurred when the deceased became unconscious and descended to 9.5 metres until he was recovered by the crew of the Paspaley II.<sup>208</sup>
174. The depth gauge would record as a discrete dive the time a diver had spent below a depth of 1.2 metres. If the diver surfaced for less than five minutes, the dive time would continue to run with the time on the surface included. If the diver was on or near the surface for longer than five minutes and then re-submerged, a new dive time would start from zero.<sup>209</sup>
175. The depth gauge would also show an arrow indicating an ascent alarm during that dive.<sup>210</sup> An ascent alarm would appear on the face of the depth gauge when an ascent speed was 110% of the recommended ascent rate.<sup>211</sup> On my reading, for a depth of less than 18 metres, the recommended ascent rate was 9 metres per minute. For depths less than 12 metres, the ideal ascent rate was 8 metres per minute.<sup>212</sup>

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<sup>208</sup> Exhibit 1, Volume 1, Tab 10

<sup>209</sup> Supplementary Statement of Anthony Thiel, p.13 and Attachment AT6

<sup>210</sup> Exhibit 1, Volume 1, Tab 10

<sup>211</sup> Supplementary Statement of Anthony Thiel, Attachment AT6

<sup>212</sup> Exhibit 13

176. Attached to Senior Constable O'Meara's report was a photograph of Mr Evans' depth gauge, showing the recorded information for a dive enumerated as 'Log 8' with a dive time of 61 minutes and a depth of 12.6 metres. There was also an ascent alarm for that dive, which was the second dive of the day.<sup>213</sup>
177. Mr Thiel testified that he and Mr Paspaley attended the water police headquarters in about October 2012. They viewed the depth gauge and spoke to a police officer, possibly Senior Constable Bell, who informed them that the gauge had been hung off the pier at water police headquarters for 42 minutes at 4.3 metres. Mr Thiel had a recollection that the gauge had been tested by Senior Constable O'Meara on the Paspaley II in Broome, so that there appeared to have been two submersions of the depth gauge after it had been seized by police.<sup>214</sup>
178. Mr Thiel also said that he and Mr Paspaley took photos of the depth gauge and recorded the information they saw on it. Their record showed that dive 3 was at 16.1 metre for 47 minutes and had an ascent alarm and that dive 9 was at 12.6 metres for 61 minutes and also had an ascent alarm.<sup>215</sup> In oral evidence, Mr O'Meara could not recall whether there was an ascent alarm for the dive at 16.1 metres for 47 minutes.<sup>216</sup>
179. Paspaley submitted that Senior Constable O'Meara was mistaken in his understanding that the seven minute dive identified as Dive 1 was a dive following the dive in which the deceased surfaced in distress, and that it was more likely that the seven minute dive was Senior Constable O'Meara's test dive in Broome.
180. Paspaley's submission was based to a large extent on an analysis of the time at which the deceased was likely to have been under water by reference to the evidence of

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<sup>213</sup> Exhibit 1, Volume 1, Tab 10

<sup>214</sup> ts 641-642 per Thiel, A

<sup>215</sup> Exhibit 15

<sup>216</sup> ts 155 per O'Meara, S F

Mr Morton, Mr Theodore and Mr Sinclair as to the time elapsed before the dive was called off (about 35 minutes) added to the time it took Mr Morton to surface and see Mr Watson and Mr Hulme attempting to tow the deceased to the Paspaley II (time to ascend plus about eight minutes of a 10 minute decompression stop). The sum of those times, submitted Paspaley, was consistent with the 47 minutes on the depth gauge for the eighth dive.

181. Paspaley submitted that, if the seven minute dive shown on the depth gauge was attributable to the deceased, the deceased would have been below 1.2 metres for 47 minutes, then at the surface or at least at a depth above 1.2 metres for five minutes, then the seven minutes below 1.2 metres. The sum of those times is 59 minutes. If that figure were correct, Paspaley submitted, Mr Morton would have to have taken over 24 minutes to surface after the dive was called off, which Paspaley submits was not possible.
182. Paspaley also submits that the significance of the fact that the seven minute dive was not attributable to the deceased is that the delay in retrieving the deceased after he had surfaced in distress was about 12 minutes rather than seven to 10 minutes.
183. Unfortunately, neither Senior Constable O'Meara nor Senior Constable Bell were asked during their oral evidence whether the seven minute dive recorded on the depth gauge could have been a test dive undertaken by Senior Constable O'Meara while wearing the gauge.
184. Following receipt of Paspaley's submissions, I requested a response from Senior Constable Bell, who agreed in an email dated 6 December 2017 to Sergeant Housiaux that Mr Paspaley and Mr Thiel attended the water police headquarters in October 2012. Senior Constable Bell said that he checked the police running sheet entries, photographs and a check list that was followed during the test dive in Broome, and he confirmed that Senior

Constable O'Meara did not conduct the test dive while wearing the depth gauge used by the deceased.<sup>217</sup>

185. Senior Constable Bell advised that Dive 1 (the seven minute dive) on the depth gauge was the last record made on the gauge worn by the deceased and that, if that dive was not conducted by the deceased, it was not recorded by police during test dives. He said that there was no evidence suggesting that Dive 1 was recorded on the gauge by any other means.
186. Senior Constable Bell also provided copies of the relevant running sheets and the check list, which show that the test dive took place on 17 April 2012 and do not show that the depth gauge was tested. He also referred me to photographs taken on the Paspaley II on 16 April 2012 and 18 April 2012.<sup>218</sup>
187. While the photographs were equivocal, the running sheet entries compiled by the water police on 17 April 2012 show that the duration of the test dive undertaken by Senior Constable O'Meara (and First Class Constable Houston) was about 18 minutes as mentioned above. It is therefore apparent that the seven minute dive appearing on the depth gauge worn by the deceased was not the result of that test dive so was, by default, attributable to the deceased.
188. The Court also received from Mr O'Meara an email in which he stated that he tested the depth gauge in 10 metres of water and it 'worked correctly without fault', and he compared the information recorded on it 'fitted the dive profile in association to company records'. On that basis he formed the opinion that the depth gauge was 'reliable and in good order'.<sup>219</sup>
189. It is arguable that Mr Morton's evidence would accord more readily with the data recorded on the depth gauge

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<sup>217</sup> Email from BELL Brad [PD09422] to Housiaux, Lyle dated 6 December 2017

<sup>218</sup> Exhibit 1, Volume 7, Tab 18, photos 99, 100 and 118; Exhibit 1, Volume 7, Tab 21, photos 24 and 25

<sup>219</sup> Email from O'Meara, Steve to Housiaux, Lyle dated 23 January 2018

if the seven minute dive were not attributed to the deceased, but in the absence of evidence calling into question the veracity or reliability of the data from the depth gauge, it provides the only objective evidence available and cannot be ignored out of hand.

190. The eye-witness evidence of the time of the banging up, together with the recording of 47 minutes for Dive 2 on the depth gauge, leads to the conclusion that the deceased surfaced at around 30 or 35 minutes into the dive but then submerged and went below a depth of 1.2 metres, at least intermittently, for the next 12 to 17 minutes. He then stayed above 1.2 metres for at least five minutes (to end Dive 2 at 47 minutes and to reset the depth gauge) before he descended below 1.2 metres for seven minutes (which appeared as Dive 1 on the depth gauge), including to a depth of 9.5 metres. He was then pulled to the surface and was lifted onto the Paspaley II.
191. On that analysis, the fact that the depth gauge showed dive times of 47 minutes and seven minutes does not necessarily mean that the deceased was actually on the surface for five minutes before dives. It also means that the total time that the deceased was in the water after he was first sighted on the surface until he was pulled to the surface by Mr Evans was 24 to 29 minutes.
192. The other important consideration to take from that analysis is that the reliability of the evidence of Mr Evans, Ms Wiebe and Mr Watson that they saw the deceased surface twice or perhaps three times for what appears to have been a matter of seconds each time and then did not surface again, is not affected.
193. Their evidence is consistent with evidence that the Paspaley II would have been pulling the deceased forward and towards the surface.<sup>220</sup> As Mr McKenzie said, it was certainly possible that the deceased was 'kind of porpoising along' as he was dragged through

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<sup>220</sup> ts 629-670 per Thiel, A; ts 518 per McKenzie, C

the water.<sup>221</sup> Their evidence is also consistent with the evidence that, after the deceased was seen, the Paspaley II was slowed considerably by the use of the drogue which, given the evidence that he was negatively buoyant due to the neck bag and bailout bottle, would have caused him to sink until Mr Evans pulled him up as he neared the vessel. Following the inquest I obtained estimates from the police diving squad that the deceased's dive gear weighed 12.5 kg.<sup>222</sup> Paspaley estimated that the 15 pearl shells weighed approximately 1.9 kg when submerged.<sup>223</sup>

194. Therefore, whether or not the record kept by the depth gauge was accurate, I am satisfied on balance that, at about 30 to 35 minutes into the eighth dive, the deceased surfaced twice or, less likely, three times and shouted. He then sank below the surface after less than one minute. He remained under water until he was pulled to the surface near the Paspaley II.
195. If the depth gauge was accurate, it proved on its own that the deceased did not surface for five minutes as assumed by Dr Edmonds. If he had, Dive 2 would have been recorded as 35 minutes or less.

### **Conclusion**

196. I am satisfied on the facts as I have found them, together with the expert evidence, that the deceased suffered pulmonary barotrauma from an uncontrolled ascent, which resulted in an air embolism and CAGE, which incapacitated him and led to his death from drowning.
197. The pertinent facts supporting this conclusion were the deceased's sudden surfacing, making a loud noise and then submerging within one minute without a regulator

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<sup>221</sup> ts 518 per McKenzie, C

<sup>222</sup> Email from VEAL Rod [PD08222] dated 29 May 2017. It appears that this estimate is for the weight out of the water

<sup>223</sup> Email from Nicholas Ellery to Housiaux, Lyle 7 June 2017

in his mouth, after which he remained submerged for at least 12 minutes. Also important was the finding at post mortem of gas in the left atrium and not elsewhere. The rapid ascent alarm on the depth gauge also adds support. My conclusion would be the same if I had found that the deceased had remained on the surface for twice as long.

198. As to the expert evidence, in effect I accept the opinion of all the expert witnesses with respect to the cause of death, including that of Dr Edmonds who, as I understand his evidence, would have agreed with Dr Caruso, Dr Moss and Dr Wong that air embolism was a likely cause of the drowning had he understood that the deceased surfaced for less than one minute, as I have found.
199. While I accept that salt water aspiration may have played a part in causing the deceased to ascend rapidly, I do not accept that the evidence establishes that conclusion to any degree of satisfaction. In any event, if the deceased ascended rapidly and suffered an air embolism which led to his death by drowning, in my view the salt water aspiration would be part of the circumstances surrounding the death, but the cause of death would remain drowning secondary to an air embolism.
200. Dr Edmond's suggestion that the deceased may have been affected by a delayed hypoxic effect from salt water aspiration appears to me speculative since it is based upon a questionable interpretation of an utterance by the deceased, as well as a mistaken, though understandable, view of the evidence about timing of the incident in which the deceased lost his work-line.

## **HOW DEATH OCCURRED**

201. While my finding above of the cause of death is based to a large extent on findings of the circumstances surrounding the deceased's death, it does not address

the more difficult issue of why the deceased made an uncontrolled ascent which led to an air embolism, pulmonary barotrauma and CAGE.

202. The difficulty of this issue is compounded by the deceased's undoubted competence and experience as a diver. As Mr Sinclair stated, he was a natural diver. He was a confident, fit and very knowledgeable diver.<sup>224</sup>
203. In addition, the deceased had no difficulties on the previous day, and had demonstrated his composure under stress when he experienced a mud-monster in an earlier dive. The visibility on the last dive was adequate, and he had functioning equipment, which included the bail-out bottle, so he had no shortage of breathable air. When last seen, he was collecting shell without apparent problems. The daily log sheet records that in collecting 15 shells, he had already collected more than he had collected in all but one of the previous dives.
204. One theory of what went wrong was that the deceased somehow aspirated seawater, leading to panic and an uncontrolled ascent. That aspiration could have possibly been as a result of the bitten-off lugs on his regulator mouthpiece, but there is no evidence of how or why the lugs could have been damaged before he surfaced. The evidence of Dr Caruso and Dr Edmonds established that the deceased could have bitten them off during a seizure from an arterial embolism, from hypoxic spasm or while panicking.<sup>225</sup>
205. It is also clear on the evidence that the deceased had spare mouthpieces with his gear on the Paspaley II and that he could have readily replaced his existing mouthpiece before the last dive if necessary.<sup>226</sup> As mentioned above, the evidence indicates that it is unlikely that an experienced diver would have entered the water with a faulty mouthpiece.

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<sup>224</sup> Exhibit 1, Volume 2, Tab 9

<sup>225</sup> ts 389-390 per Edmonds, C; ts 479 and 489-490 per Caruso, J

<sup>226</sup> ts 154 per O'Meara, S F; ts 174 per Sinclair, J P

206. This is not to say that the deceased could not have aspirated a small amount of seawater and had then made an uncontrolled ascent in a panic to reach the surface. In accepting that scenario as a possibility, Dr Caruso said that ‘the unfortunate part about diving is that the self-preservation reaction is to get to the surface’.<sup>227</sup>
207. Another theory was related to the deceased’s shoulder surgery and his congenital deficiency of his right pectoralis major muscle. Dr Caruso explained that the pectoralis major deficiency could have caused potential limitations.<sup>228</sup> Dr Edmonds considered it likely that the deceased’s shoulder injury and subsequent major surgery would have compromised his muscular capability.<sup>229</sup>
208. Paspaley reasonably submitted that none of the other divers on the Paspaley II, including the other new divers had a problem on 12 April 2012, so it was open to speculate that the deceased’s physical issues may have exposed him to a unique stress. However, the submission was qualified on the basis that it was only possible to speculate, and it was not possible to know.
209. A possible factor supporting the theory related to the deceased’s physical issues was the level of fatigue experienced by the new divers on the Paspaley II. It is possible to infer that the deceased’s pectoralis major deficiency could have accentuated that fatigue.
210. In the end, I am not willing to speculate on what caused the deceased to make an uncontrolled ascent.
211. However, I am satisfied that, as the deceased died from the inherent risk of drowning following an air embolism

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<sup>227</sup> ts 484 per Caruso, J

<sup>228</sup> ts 469-470 per Caruso, J

<sup>229</sup> Exhibit 1, Volume 2, Tab 18

while engaged in compressed-air diving, death occurred by way of misadventure.

212. The question remains as to whether Paspaley's workplace practices caused or contributed to the deceased's death.

## **PASPALEY'S PROCEDURES**

### **Code of Practice**

213. In April 2012 the only external standards followed by Paspaley were, apart from common law duties of care and the employers' duties under the *Occupational Safety and Health Act 1984*, the Code of Practice.<sup>230</sup>
214. The Code of Practice then required that divers be at least 18 years old, that they possess current a medical certificate under AS2299, that they possess a diver's open water certificate, and that they have completed the Pearl Producers Association's diver induction course. Individual employer companies were to provide diving induction training and supervised work for farm, dump, turning and drift diving.<sup>231</sup>
215. Under the heading 'Diving Safe Practice and Procedures', the Code of Practice provided that the employer company was responsible for all diving operations and that some or all of the responsibilities could be delegated to managers. For dive site operations, the head diver was responsible for the delegated duties.<sup>232</sup>
216. Under the heading 'Drift Diving', the Code of Practice provided responsibilities to the drift dive operation manager, the fleet master, the skipper of each vessel, the head drift diver of each vessel, and each diver. Drift

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<sup>230</sup> Exhibit 1, Volume 7, Tab 3

<sup>231</sup> Exhibit 1, Volume 7, Tab 3, Clause 2.1

<sup>232</sup> Exhibit 1, Volume 7, Tab 3, Clauses 3.1.A, B and C

vessels were to be equipped with communication systems between diving attendant and head divers during operations, at minimum a hand-operated buzzer arrangement. There were requirements related to dive equipment, pre-dive planning and procedures as well as dive procedures.<sup>233</sup>

217. Also under the heading 'Drift Diving' were requirements related to emergency procedures, which relevantly provided:

A. All personnel are to be trained and practised in signalling systems, emergency and rescue procedures in a working environment. Diving emergency drills are to be practised a minimum of twice yearly.'

B. In the event of a diver presenting with illness, co-ordination problems or there has been a dive incident resulting in some injury, the nominated company representative shall contact an appropriate hyperbaric dive medical advisor/facility seeking advice for continuing treatment and or evacuation requirements following the administration of basic first aid treatment or oxygen treatment.

218. Under the heading 'Emergency Procedures Dive Related', the Code of Practice stipulated: Companies should ensure dive emergency procedures cover the search, recovery and retrieval of injured divers.<sup>234</sup>

219. There can be no doubt that, while Paspaley generally complied with Code of Practice relevant to drift diving, in the time leading up to the deceased's death, it failed to train and practice its personnel in emergency and rescue procedures covering the search, recovery and retrieval of injured divers. As a result of that failure, the deceased was submerged for at least 12 and

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<sup>233</sup> Exhibit 1, Volume 7, Tab 3, Clauses 3.3.1 to 3.3.3.4

<sup>234</sup> Exhibit 1, Volume 7, Tab 3, Clause 7.4

possibly 20 minutes after he first surfaced and cried out for help, and it led to the appalling chaos in moving the deceased from the water onto the back deck of the Paspaley II once he had been pulled to the surface.

220. As noted in the Introduction above, Paspaley pleaded guilty to a charge under the *Occupational Safety and Health Act 1984* of failing so far as was practicable to provide and maintain a working environment in which its employees were not exposed to hazards. It is apparent that the particulars of the charge were limited to the failure to provide a procedure for the retrieval of an injured diver.
221. In oral evidence Mr Harrison and Mr Paspaley each said that the risk of drowning was never considered to be significant enough to warrant a procedure for retrieving a diver.<sup>235</sup> This was so, said Mr Paspaley, because of all the developments in the pearling industry for 100 years to prevent divers from drowning. The system was designed as a fundamental principle to not have an incapacitated diver on the surface.<sup>236</sup>
222. As to the requirement in the Code of Practice, Mr Paspaley said that the requirement was mistakenly understood to mean a medical evacuation procedure, which Paspaley did have in place at the time. It was only after the deceased's death that it became extremely obvious to Paspaley that the recovery of a diver meant recovering the diver from the water up to the deck of a vessel.<sup>237</sup>

### **Following the Deceased's death**

223. On 15 April 2012 Paspaley implemented a procedure whereby a diver who surfaced without making an 'okay' signal was presumed to require urgent assistance to return to the vessel. In such circumstances, an

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<sup>235</sup> ts 351 per Harrison, D A; ts 662-663, 667, 688 per Paspaley, J

<sup>236</sup> ts 662-663 per Paspaley, J

<sup>237</sup> ts 667 per Paspaley, J

emergency would be declared and the crew would be notified. That procedure was refined and formalised in further memoranda from the operations manager, pearling operations to include a requirement that deck crew have personal flotation devices, masks, snorkels and fins available for rescue swimmers to enter the water to assist the diver. When emergencies were declared, a dump boat was to be contacted to go to the rear of the vessel.<sup>238</sup>

224. In July 2012 Paspaley introduced a requirement for diver recovery drills to be regularly conducted. From 25 July 2012 that requirement was formalised and the drills began to be practised. The procedure adopted for retrieving an incapacitated diver involves pulling the diver by his or her air-line to the surface and onto the vessel. According to Mr Thiel, rescue swimmers are able to reach incapacitated divers within about 90 seconds.<sup>239</sup>
225. Paspaley has also modified its diver intake procedures to address the possibility that a diver may have a physical or medical reason to be at risk. From 2014 or 2015 Paspaley has required a functional assessment of diver applicants, which included evaluation of grip strength, range of movement in arms, shoulders, knees and backs, as well as a fitness test with heart rate and recovery times.<sup>240</sup>

### **WOULD THE DECEASED HAVE SURVIVED IF HE HAD BEEN RETRIEVED QUICKLY?**

226. Dr Caruso said that to treat an air embolism, 100% oxygen and a hyperbaric chamber are needed. The time within which it is necessary to give hyperbaric treatment to a diver who has suffered an air embolism will depend on the severity of the air embolism. With

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<sup>238</sup> Exhibit 6 [89]

<sup>239</sup> Exhibit 6 [183]

<sup>240</sup> ts 677-678 per Paspaley, J; Exhibit 14

someone who has been rendered unconscious, it must be presumed that it was a very severe air embolism, so getting the person to a hyperbaric chamber as fast as possible is necessary. As the timeline extends from the event, the chances of recovery become vanishingly small to non-existent.<sup>241</sup>

227. Evidence of how long it would have taken to transport the deceased to Broome for hyperbaric treatment was provided by Mr Thiel (five and a half to six hours),<sup>242</sup> Mr Watson (six hours)<sup>243</sup> and Mr Paspaley (at least four hours).<sup>244</sup>
228. When asked how he would rate the chances of survival of a diver who has surfaced, shouted once or twice and then gone back under the surface without accessing his bailout bottle, and it is going to take about five hours to get him to a hyperbaric chamber, Dr Caruso said, 'I would say vanishingly remote'.<sup>245</sup>
229. Dr Wong provided comments in which he referred to data from naval submarine escape training which indicated that, unless a diver with CAGE is retrieved immediately and recompressed immediately in a hyperbaric chamber, the chance of survival is slim. As the practicality of immediate retrieval and recompression in a CAGE casualty is not high, drowning is the most likely scenario.<sup>246</sup>
230. The foregoing indicates that, since I have found that the deceased developed CAGE before he drowned, his chances of survival had he been retrieved as soon as he surfaced were remote.
231. In these circumstances, it follows that the lack of an appropriate procedure to retrieve the deceased from the

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<sup>241</sup> ts 482-483 per Caruso, J

<sup>242</sup> Exhibit 6

<sup>243</sup> Exhibit 1, Volume 2, Tab 2

<sup>244</sup> Exhibit 20

<sup>245</sup> ts 483 per Caruso, J

<sup>246</sup> Exhibit 1, Volume 2, Tab 17.C

water was highly unlikely to have caused or contributed to the deceased's death.

232. However, to the extent that there was any chance of survival, that chance was negated by the lack of such procedure.

### **POLICE RECOMMENDATIONS – PEARLING INDUSTRY SAFETY PROCEDURES**

233. In about November 2012 First Class Constable (now Senior Constable) Houston of the Water Police Dive Squad presented to the Coroner's Court a report reviewing the equipment and practices employed aboard the Paspaley II at the time of the deceased's death (the report). The report also reviewed the training and induction programs, practices, procedures and equipment used by the pearling industry, and it provided comments regarding how they compared with standards followed by other occupational diving industries in Australia.<sup>247</sup>

234. The report identified five main areas<sup>248</sup> of deficiencies that were making the pearl drift diving industry unsafe:

- a. inadequate training;
- b. lack of sufficient personnel to adequately supervise and monitor divers and diving operations, and to act as stand-by rescue divers;
- c. lack of the following equipment:
  - i. voice communication equipment to allow all divers to speak to each other and to the vessel;

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<sup>247</sup> Exhibit 1, Volume 1, Tab 11

<sup>248</sup> Exhibit 1, Volume 1, Tab 11. The report actually identifies four main areas and combines practices with procedures.

- ii. a connection of the air-line to harnesses other than weight belts;
  - iii. buoyancy compensators;
  - iv. means of egress from the water other than ladders;
  - v. oxygen therapy equipment; and
  - vi. defibrillators;
- d. practices causing fatigue, namely paying divers per shell collected and undertaking up to 10 dives per day with short breaks between dives; and
- e. a lack of formally documented procedures, namely diving operations manuals, dive plans, risk assessments, emergency plans and dive briefings.

235. The report noted that preliminary recommendations were made on 17 April 2012 by the Dive Squad for WorkSafe to broadcast to the pearling industry as a result of safety concerns identified during the investigation into the deceased's death, but that those recommendations were not broadcast at the time.<sup>249</sup> It appears that a copy of a list of those recommendations was provided to Paspaley about that time.<sup>250</sup>

236. The report contained a set of revised recommendations provided with a view to reducing the risk to divers in the pearl drift diving industry.

237. Paspaley and the PPA responded to the identification of the deficiencies and the resultant recommendations as discussed under the following headings.

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<sup>249</sup> Exhibit 1, Volume 1, Tab 11

<sup>250</sup> ts 673 per Paspaley, J

## **Training, supervision and rescue divers**

238. The PPA and Paspaley now require that all divers have Rescue Diver qualification as well as Open Water qualification and Perform First Aid (formally Senior First Aid). Skippers and head divers are required to have advanced first aid training.
239. A new drift diver undergoes a four-day period of underwater supervision, involving:
- a. two dives on the first day, during which he or she observes the head diver or a check and train diver (a new position created for this purpose) but do not collect shell;
  - b. four dives on the second day, during which he or she collects shell while under the direct visual supervision of the head diver or the check and train diver;
  - c. six dives on the third day within the first 10m of the work-line while being generally monitored by the head diver or the check and train diver; and
  - d. a full day diving on the fourth day with the first two dives being within the first 10m of the work-line and the subsequent dives being unrestricted on the work-line, while being generally monitored by the head diver or the check and train diver.<sup>251</sup>
240. Paspaley now offers head divers a base salary plus a price per shell to compensate them for the time spent supervising new divers and to encourage them to take on the role of running the drift diving vessels eventually.<sup>252</sup>

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<sup>251</sup> Exhibit 6; ts 650 per Thiel, A; Exhibit 1, Volume 5, Tab 24

<sup>252</sup> ts 650-651 per Thiel A

241. Senior Constable Houston suggested in her report that divers in the pearl industry be trained to the level identified in AS2299, which accorded with the Aquaculture (SSBA to 30 m) course provided by Australian Diver Accreditation Scheme (ADAS). However, she agreed in oral evidence that, although she had not been a drift diver, from what she understood several of the elements of the course would be irrelevant to a drift diver and that there were aspects of drift diving which were not covered by it.<sup>253</sup> She also agreed that new drift divers could gain experience using SSBA with early on-the-job training.<sup>254</sup>
242. Mr McKenzie, who has considerable qualifications and experience as an occupational safety and health professional in the area of diving safety, diver training, as well as being a commercial diver and marine master, provided a report in which he noted that Paspaley's training had been improved and that, together with Paspaley's other improvements to risk management, all that was practical and reasonable to reduce and manage the risks in the workplace had been done.<sup>255</sup>
243. Mr McKenzie said that ADAS training has been rejected time and time again by the diving industry and by governments as unnecessary training for the sake of training, and that a lot of the skills within ADAS do not translate back to pearling. He said that by requiring divers to have rescue qualifications and then training them in SSBA and in procedures, Paspaley was more than able to deal with the risks associated with drift diving.<sup>256</sup> He said that Paspaley's training was more than adequate with the changes it had made.<sup>257</sup>
244. As to supervising the diving operations, Paspaley has maintained the view that the engagement of experienced head divers and skippers with responsibilities to

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<sup>253</sup> ts 195-196 and 218-219 per Houston, N E

<sup>254</sup> ts 200 per Houston, N E

<sup>255</sup> Exhibit 1, Volume 5,

<sup>256</sup> ts 504-505 per McKenzie, C

<sup>257</sup> ts 516 per McKenzie, C

manage and supervise diving operations obviates the need for an additional dive supervisor at the surface.<sup>258</sup> This view is supported by reference to the unique nature of drift diving where many hazards associated with other types of diving do not arise. Mr McKenzie considered that the responsibilities of a dive supervisor are covered by the head diver and skipper.<sup>259</sup>

245. As to monitoring divers and providing a rescue diver, Paspaley has implemented a requirement for two crew members to be present on the back deck of a drift diving vessel. At least one of the crew members maintains constant watch over the divers and at least one is qualified to conduct a rescue swim. Available to the rescue swimmer are a mask, snorkel and fins. SCUBA gear is not provided since Paspaley has determined that the risk of divers becoming stuck underwater is remote and that once divers are pulled by air-lines they are brought to the surface.<sup>260</sup> Mr McKenzie testified that, for those reasons, in his view a surface swimmer was 'more than adequate'.<sup>261</sup>

246. Mr Sage testified that providing a rescue diver with SCUBA gear, even with a smaller bottle such as a bail-out bottle, would significantly increase the effectiveness of the rescue diver being able to perform some sort of rescue. The benefit, he said, of the ability to go underwater with SCUBA gear was that it was much more practical and useful for the rescue diver once he or she was in the water. However, he said that it may take 10 or 15 seconds longer for the rescue diver to get into the water.

247. Senior Constable Bell also said that standby diving equipment could be basic, with just a harness with a BCD with a small cylinder, fins and a mask.<sup>262</sup>

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<sup>258</sup> Exhibit 6

<sup>259</sup> ts 502 per McKenzie, C

<sup>260</sup> ts 629-630 per Thiel A

<sup>261</sup> ts 503 per McKenzie, C

<sup>262</sup> ts 27 per Bell, B M

248. The foregoing evidence indicates that the police concerns about Paspaley's training, supervision, monitoring and provision of rescue divers have been addressed appropriately.
249. The conflicting considerations relating to providing rescue swimmers/divers with either snorkelling gear or SCUBA gear are such that I am not satisfied that the provision of only snorkelling gear is inappropriate. However, having a small bottle available for the rescue swimmer could potentially be useful and, presumably, would not be overly inconvenient to arrange. I therefore suggest that employers in the pearl industry and the PPA consider adopting that practice as standard practice.

### **Lack of communication equipment**

250. The system of a hand operated buzzer as a means of communication between the head diver and the deck hand accorded with the Code of Practice in 2012. Senior Constable Houston suggested in her report that, in accordance with AS2299, voice communications should be considered for all divers in the pearling industry in addition to a secondary two-way signal system.<sup>263</sup>
251. Paspaley has implemented a system comprising signal boxes and hoses to permit divers to send an emergency signal to all crew on board the vessel, but has not implemented voice communications due to the facts that voice communication is rarely required and that two-way voice communication would require full or half-face masks.
252. Paspaley do not currently consider full-face masks to be workable due to difficulties associated with the additional bulk and reduction in visibility, such as increased fatigue. There are also problems associated with attaching full-face masks to the oxygen

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<sup>263</sup> Exhibit 1, Volume 1, Tab11.

decompression lines and, in particular, with emergency situations where a diver jettisons the air-line and the whole mask is ripped off the diver's head.<sup>264</sup>

253. Mr McKenzie, who had experience using full-face masks as a commercial diver, said that they could cause more problems, such as fatigue, lack of visibility and water leaks, than they solved.<sup>265</sup>
254. Mr Thiel noted that there were benefits associated with full-face masks, especially the fact that if a diver passes out, his or her head is still in a breathable space, and also that they mitigate against irukandji stings. So, he said, he was not totally opposed to full-face masks without even considering their use for communication.<sup>266</sup>
255. Senior Constable Houston noted in her report that the use of a full-face mask would mean that the mask would have to be discarded in the event of a bailout and she agreed that drift diving did not need voice communication in non-emergency situations. She agreed that she was alive to the fact that, before concluding that full-face mask should be used, it was necessary to consider whether it would introduce new and additional risks.<sup>267</sup>
256. Dr Edmonds was a strong proponent of the use of full-face masks. He considered that any increased fatigue from drag would be negligible and that full-face masks are much safer than half-face masks. He said if the deceased had been wearing a full-face mask, he would not have drowned.<sup>268</sup> Dr Caruso said that, if the deceased had been wearing a full-face mask, he would not have drowned but that he would still have had an air embolism.<sup>269</sup>

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<sup>264</sup> ts 637 per Thiel, A

<sup>265</sup> ts 500-501 per McKenzie, C

<sup>266</sup> ts 637-638 per Thiel, A

<sup>267</sup> ts 221 per Houston, N E

<sup>268</sup> ts 377-378 per Edmonds, C

<sup>269</sup> ts 482 per Caruso, J

257. In my view, the evidence related to the lack of communication equipment indicates that, to the extent that emergency communication is required, Paspaley's implementation of the signal boxes to allow divers to send an emergency signal to all crew is an improvement over the pre-existing situation. In relation to the suggestion that full-face masks be used, I encourage pearling industry employers and the PPA to continue to explore the possibility of using them in order to reduce further the likelihood of divers drowning.

### **Air-lines not connected to harnesses**

258. As to the connection of air-lines to harnesses other than weight belts, Senior Constable Bell said in oral evidence that in recreational diving and all diving training, you are taught from day one that you do not connect anything to your weight belt. He did not suggest that Paspaley's system of doing so had a bearing on the deceased's death, but that it was a dangerous practice.<sup>270</sup>

259. Mr Thiel stated that the reason for connecting air-lines to weight belts is that Paspaley considers it to be the best means for a diver to become free of the air-line and to bail-out safely. Drift divers would have been trained as recreational divers to ditch weight belts in an emergency<sup>271</sup> and drift divers are drilled in switching to bail-out bottles.<sup>272</sup>

260. While the evidence on this issue is in conflict, Mr Thiel's explanation for Paspaley's system of attaching air-lines to weight belts seems reasonable. In any event, it does not appear so unreasonable that, once understood, the system deserves criticism.

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<sup>270</sup> ts 39 per Bell, B M

<sup>271</sup> ts 269 per Theodore, J M

<sup>272</sup> Exhibit G; Supplementary Witness Statement of Antony (Tony) Thiel

### **Lack of buoyancy compensator devices**

261. Since the deceased's death, Paspaley has implemented the requirement for drift divers to wear BCD's and the PPA adopted the requirement in the Code of Practice in March 2014.<sup>273</sup>
262. Mr Thiel stated that Paspaley has also improved the regulators on the bail-out bottles to allow inflation of BCD's without risking inadvertent inflation. The new set-up has been widely accepted.<sup>274</sup>

### **Lack of egress from the water**

263. Since the deceased's death, Paspaley has implemented a simple new procedure in which an incapacitated diver is pulled up onto the deck by the air-line, with a winch normally used to lift big bags available to assist.<sup>275</sup>

### **Lack of oxygen therapy equipment and defibrillator**

264. At the time of the deceased's death, the Paspaley II had first aid equipment which included the means of delivering oxygen therapy, but did not have the means of applying suction or positive pressure oxygen for resuscitation. Since then, Paspaley has installed Oxy-viva units with those capabilities. Automated external defibrillators with integrated CPR advisors have also been installed.<sup>276</sup>
265. In March 2017 the installation of Oxy-vivas and defibrillators was been adopted by the PPA in the Code of Practice.<sup>277</sup>

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<sup>273</sup> Exhibit 6; Exhibit 1, Volume 5, Tab 33

<sup>274</sup> Exhibit 6

<sup>275</sup> Exhibit 6

<sup>276</sup> Exhibit 6

<sup>277</sup> Exhibit 1, Volume 7, Tab 24

## Practices causing fatigue

266. As to the issue of payment per shell exacerbating fatigue, it does seem self-evident that that reasoning behind the practice is to encourage divers to work quickly to collect shell. As Mr Thiel stated, this method of payment rewards ability and effort in a fair and transparent manner.<sup>278</sup>
267. In addition, the clear purpose of the high number of dives per day and the short breaks between dives is to make the most use of a limited window to collect shell. In order to ensure that divers do not dive for more than eight days in a row while also allowing shell collection over a neap period, Paspaley keeps divers out of the water on a rotational basis.<sup>279</sup> That practice indicates an appreciation of the physical nature of the work.
268. I note Mr Sinclair's evidence that both he and the deceased wanted to earn as much money as they could over the four-month season and then not work for the rest of the year.<sup>280</sup> While that attitude might be seen as self-imposed pressure, it also indicated that divers considered themselves well-compensated for their work.
269. In my view, the evidence established that pearl drift diving is hard work, particularly for new divers. However, it is also apparent that divers become accustomed to the physical nature of the job. To the extent that the potential for drift diving to cause fatigue to the point that it might become, or give rise to, a hazard, it appears that any such potential was most likely to have occurred in the first few days of diving.
270. Given the changes to Paspaley's medical requirements, induction and training procedures, which have created a stepped initiation to drift diving, the potential for fatigue-related hazard has been reduced, irrespective of

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<sup>278</sup> Exhibit 6

<sup>279</sup> Exhibit 6

<sup>280</sup> Exhibit 1, Volume 2, Tab 9

other considerations such as payment per shell and long days with short breaks.

### **Lack of formally documented procedures**

271. This issue has been addressed by the PPA by adopting a series of recommendations made by police to implement the documentation of manuals, risk assessments, dive plans and emergency plans.
272. Paspaley says that it has effectively complied with those recommendations by having comparable documents in place, including emergency plans, daily dive plans, and the Vessel/Farm SMS and SOPs Manual.
273. Paspaley also acknowledges the need to conduct initial formal risk assessments and to repeat them regularly

### **Conclusion regarding responses to safety procedures**

274. As noted above, Mr McKenzie expressed the view that, given improvements to Paspaley's training together with other improvements to risk management, Paspaley had done all that was practical and reasonable to reduce and manage the risks in the workplace had been done.<sup>281</sup>
275. While that appears to be an overly broad view, it does seem to me that, notwithstanding its decisions not to implement all the requirements of AS2299, the PPA and Paspaley have implemented procedures and have provided training and equipment to reduce significantly the likelihood that another of its pearl drift divers will die in similar circumstances to the deceased.
276. I also note that the deceased's family acknowledged that Paspaley has made many improvements since the deceased's death.<sup>282</sup>

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<sup>281</sup> Exhibit 1, Volume 5, before Tab 1

<sup>282</sup> ts 745 per Mr Hampton

## CONCLUSION

277. The deceased died while he was engaged in what the uninitiated might idealise to be a glamorous and exciting but relatively safe occupation. His death has highlighted the inherent danger with all activities in, on or, especially, under water.
278. While the evidence could not establish the cause of the deceased's ascent, panic has been identified by expert witnesses as a likely component. That panic can so affect a fit and highly experienced diver is a sobering lesson for everyone engaged in the diving industry.
279. The deceased's family sought an inquest as a means of finding the truth about the circumstances of the deceased's death. Unfortunately, the answer to the central question of why the deceased surfaced in distress has not been revealed. I can only hope that the changes that have been made to occupational safety in relation to pearl diving as a result of his death can provide his family with some comfort for their profound loss.

B P King  
Coroner  
13 February 2018