

# QUEENSLAND POLICE SERVICE

OPERATIONS SUPPORT COMMAND  
Specialist Services Branch  
Police Diving Squad  
Howard Smith Drive, Lytton, Qld, 4178.  
PO Box 8103, Wynnum North, Qld, 4178.

Our Ref: OSCR

Your Ref:

10<sup>th</sup> September 2004

TO: Officer in Charge  
Police Diving Squad

FROM: Senior Constable D. M. E. Netting  
Police Diving Squad

SUBJECT: PRACTICAL EVALUATION OF SCUBA  
EQUIPMENT USED BY CHRISTINA THOMAS  
WATSON. SCUBA DEATH, 22/10/2003  
TOWNSVILLE

## INTRODUCTION.

1. On Thursday the 6<sup>th</sup> of November 2003, I gained possession of exhibit Number A 837198 sent from Townsville Water Police in a sealed and locked exhibit box. The exhibit was entered at the Brisbane Water Police as exhibit A636066. The deceased Christina Mae THOMAS WATSON who died whilst diving off Townsville on The 22nd of October 2003 had reportedly used these items of scuba equipment entered as an exhibit.

The equipment retained for examination was as follows:

## EQUIPMENT RETAINED.

2. One Sea hornet 63cu/ft aluminum scuba cylinder. This cylinder was stamped on the bottom with the serial number SF 9682. This cylinder was fitted with a 'K' valve (Sea Hornet brand), stamped with the letters MBT 5 on the top of the valve and '36mpa' on the burst disc. The cylinder was last hydrostatically tested in February 2003. The cylinder was silver and possessed no surface corrosion. (Photo 19)
3. Attached correctly to the cylinder valve was one 'Atomic Aquatics, CE 0515', brand first stage regulator, serial number, FGB379. This first stage had the following attachments: (Photo 2 & 3 & 18)

State v. Watson  
003491

*10/9/04 Summary - s/c 10826*

QUEENSLAND POLICE SERVICE

- 3.1 One 'Atomic Aquatics, Zirconium Z1' brand primary second stage demand valve, no visible external serial number, with a black housing and grey cover/face plate. This demand valve was attached to the 1st stage via a black intermediate hose. A serial was discovered under the mouthpiece and read A28281. (Photo's 4 & 5 & 11).
  - 3.2 One 'Oceanic' octopus second stage regulator (octopus), with black housing and blue cover/face plate. This octopus was integrated with the BCD inflator system and attached to the first stage, via the black inflator intermediate hose. No visible serial, but a white sticker with the numbers 012A2914 was located on the back of the inflator. (Photo's 6 & 7)
  - 3.3 One black BCD (buoyancy control device) inflation hose was fitted and integrated with the 'octopus' second stage hose (Overall Photo 8 & 9).
  - 3.4 One black combination 'Oceanic' cylinder contents and analogue depth gauge that had a open space for a diving computer, (the computer is with the WPH & S officer for Cairns and did not arrive with the equipment), and compass attached. Upon arrival the depth indicated approximately 65ft and this system was connected to the first stage via a black intermediate hose. (Photo 10)
  - 3.5 When the tank spindle valve was turned off upon arrival and when turned to on the cylinder contents gauge indicated 2200psi of pressure remaining.
4. Correctly attached to the cylinder was a black 'Oceanic' brand Buoyancy control device (BCD), Is a model, no visible serial number, size X Small. The BCD is fitted with an integrated 'octopus' inflator system with incorporated dump valve on the shoulder assembly. The BCD possessed one dump valve on the rear and a fluoro orange 'Safety sausage' was attached to the right hand shoulder clip. A small bottle of 'Aquaseal' antifog was found in the right zip pocket. (Overall Photo 1 and photos 8 & 9)
- 4.1 Upon arrival the BCD had two integrated weight pouches placed correctly in the 'Oceanic Quicklock Release' weight pockets with 2 x 3 lb weights in each pouch, totaling 12 lbs. Also located in the rear 'non dump able weight pouches' at the rear of the BCD was 1 x 3 lb weight and a small 1 lb shot weight in each pouch, totaling 8 lbs. (Photo 9)

**Note:** the inflator hose attached to the BCD was partially unscrewed at the fitting with the bayonet clip, however due to the integration of the octopus second stage this could not have been unscrewed at the initial time of the dive by the deceased. The air in the lines is of intermediate pressure and the o-ring will bleed out visibly and audibly and would have been noticed on the surface prior to the dive. The hose connection had to be tightened slightly before the

State v. Watson  
003492

*10/10/08 for summary - SC 10812*

test dive commenced. The possibility is that this connection was loosened during transport from the dive site. (Photo's 12 & 13)

### PRACTICAL TESTING.

5. On the 17<sup>th</sup> of December 2003, myself and other members of the Police Diving Squad attended the 'Measured Mile', Moreton Bay with Brisbane water police in the P. G. Kidd to obtain 12 metres in depth, where the aforementioned diving equipment was subjected to the following examination:-

6. The buoyancy control device (BCD) was fitted to a Police Diving Squad cylinder and the fastening strap was found to hold the cylinder firmly.

7. The first stage and its attachments were fitted to the cylinder valve via the yoke attachment and the inflation hose was connected by way of the snap-on bayonet type coupling to the BCD inlet. As per previous comments this fitting was tightened slightly prior to in water. The cylinder was then turned on and the system was found to have no apparent leaks.

8. The BCD was then fully inflated (on land) using the power inflate button where the over pressure relief valve was found to operate correctly.

9. The BCD and regulator configuration was used by 1 Diving Squad member, (70kgs in weight) wearing long john wetsuit and rash suit (similar to the buoyancy of the suit worn by the deceased) and weights (20 lbs), the same weight amounts worn by the deceased

9.1. **Fin swimming on back.** The BCD was fully inflated to the point of activation of the over pressure valve. The wearer then attempted the fin on the surface on their back as far as they could until buoyancy was lost. Swimming in this manner resulted in the BCD remaining fully inflated throughout the exercise. The materials and design of the inflator held the lower inflator assembly to the inflator hose causing no leaks.

9.2. **Floating in upright position.** The BCD was again fully inflated. The wearer then remained stationary and upright position to test if buoyancy was lost. In this instance no buoyancy was lost.

9.3. **Fin swimming face down (Snorkeling position).** The BCD was fully inflated to the point of activation of the over pressure valve. The wearer then attempted to fin on the surface, face down as far as they could until buoyancy was lost. In this instance, no buoyancy was lost

10. Both primary and octopus second stage/demand valves were checked and found to be operating correctly.

State v. Watson  
003493

10/9/04 *Quarley* s/c 10826

11. Both divers (Netting and Perkins) descended to the seabed, a depth of twelve (12) meters. Over a diving period of approx. 18 minutes, both demand valves were found to operate satisfactorily under both relaxed and simulated hard work conditions.

12. The Primary and inflator/octopus regulator easily free flowed on several instances. Free flowing ceased when the regulator was used or stowed or rotated to the vertical position.

#### AIR ANALYSIS.

13. On the 18<sup>th</sup> of November 2003, the cylinder in question was conveyed to Safety In Mines Testing and Research Station. (S.I.M.T.A.R.S) at Redbank for air analysis. See Report attached.

#### MISCELLANEOUS EXAMINATIONS.

14. On the 19<sup>th</sup> of December 2003, in company with S/C Cornish, I conveyed the regulators to Sea lab Systems / Pressure Technologies in Chester St, Fortitude Valley to have the regulator line pressure and accuracy of the gauges checked on calibrated equipment.

15. The line pressure was recorded at 145psi this pressure is at the optimum range (145 psi) for this regulator. Both regulators were found to have strong purges. The cylinder contents gauge was tested for accuracy at 4 different pressures - from full cylinder pressure (3000 psi) to reserve pressure (500psi). The gauge was found to be accurate.

#### INTERNAL INSPECTION OF EQUIPMENT.

16. Later I conducted an internal inspection of the regulator assemblies and the BCD inflator assemblies. Results of these inspections are as follows:

17. An inspection of the 1st stage found components to be in excellent condition and serviceability. The sintered filter was clean and well kept with no signs of corrosion. (Photo's 14 & 15)

18. An internal inspection of the second stage demand valves revealed that all parts were in excellent condition (Photo's 16 & 17).

19. No corrosion or wear were found on the 2nd stage regulator or the inflator/octopus regulator.

20. An internal inspection of the hired scuba cylinder was undertaken. The cylinder was in test (Last test date 2/2003, Photo 20). The valve required a significant amount of force to remove from the cylinder valve (Photo's 21,22,23). When extracted the internal observations of the cylinder revealed a small amount of aluminum pitting and corrosion. No neck cracks or distortions to the wall of the cylinder were located (Photo

10/10/04 Summary etc were

24). The cylinder valve assembly and internal workings were found to be of average condition. (22).

21. All hoses and fittings were inspected and found to be in excellent condition.

22. The BCD inflator/Octopus was inspected and was found to be in excellent condition.

### PHOTOGRAPHS.

23. In my presence and at my direction, photographs were taken by a Police Photographic Section, Scenes of Crime officer. These photographs are attached to this report and have been numbered 1 to 20 and a relevant description of each photograph is listed below: -

1. Overall photograph of the scuba equipment as received.
- 2 & 3. Photograph of 'Atomic Aquatics Brand CE0515 serial FGB379' Brand first stage
- 4 & 5. Photograph of 'Atomic Aquatics, Zirconium Z1' Brand second stage serial number.
- 6 & 7. Photograph of 'Oceanic' Brand Secondary second stage (Octopus) with integrated inflator assembly.
8. Photograph of the rear of the BCD.
9. Photograph of the front of the BCD and the weight system.
10. Photograph of the black combination cylinder contents and analogue depth gauge.
11. Photograph of the second stage serial number.
- 12 & 13. Photograph of the inflator hose fitting.
- 14 & 15. Photograph of the first stage sintered filter and first stage general appearance.
- 16 & 17. Photograph of internal appearance of the second stage regulator
18. Photograph of the overall appearance of the regulator set
19. Photograph of Cylinder overall photo
20. Photograph of Cylinder hydrostatic test date

State v. Watson  
003495

10/9/04 *Handwritten signature* s/c 10826

21 to 24 Photographs of the Cylinder valve and cylinder neck condition

SUMMARY.

24. **PRACTICAL TESTING** - No difficulty was experienced with the functioning of the breathing apparatus when used under both relaxed and simulated hard work conditions. The BCD functioned well under both relaxed and simulated hard work conditions. The BCD inflated fully and held air to its capacity and vented efficiently, the inflator/octopus assembly also performed its function correctly.

25. **AIR PURITY** - Report from S.I.M.T.A.R.S is attached

26. Attached is a Fax from Dr R. L. THOMAS, Diving physician to the Police Diving Squad. He states a small increase in the amount of CO<sub>2</sub>, as per detected, 600ppm in the sample, 120ppm above Australian Standards, Code of Practice will not have any effect on a diver. Dr THOMAS states 'I cannot believe that the small excess of CO<sub>2</sub> could exert any clinical effect whatsoever'. See attached report.

CONCLUSION.

27. The condition of all of the personal diving equipment provided by investigating officers was of excellent quality and cleanliness. The condition of the regulators was clean and excellent working order. No life threatening faults were found.

28. The BCD inflator/octopus bayonet fitting worn by the deceased was found to be not fully tightened. If the inflator was only slightly loose at the time of death the o-ring attachment would have still allowed the BCD to be inflated to full capacity. Further loosening of this fitting could have happened in transit from the dive site and it is impossible to determine exactly how loose the fitting would have been at time of death. However as discussed earlier, if the fitting was very loose the configuration of the inflator/octopus assembly would have contributed to a large amount of air escaping from this fitting which would have been too significant on the surface not to be noticed.

Attachments to this report:

- (a) Report from Safety in Mines and Testing and Research Station (SIMTARS)
- (b) Series of photographs numbered 1 to 24.
- (c) Copy of a Fax sent to Police Diving Squad from Dr R. L. Thomas

State v. Watson  
003496

10/9/04 Summary s/c 10826

**Recommendation**

28. This report be forwarded to Senior Constable Glenn Lawrence at Townsville Water Police for consideration and attachment to the Coroners file.



**D.M.E. Netting**  
**Senior Constable 10826**  
**POLICE DIVING SQUAD.**  
(Ph 3895 0340)

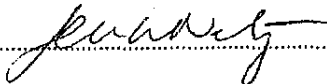
**Oaths Act Declaration**

**OATHS ACT 1867 (DECLARATION)**

I Donna Marie Eleanor Netting do solemnly and sincerely declare that:


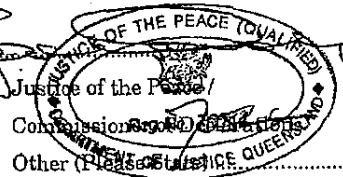
- (1) This written statement by me dated 10th of September 2004 and contained in pages numbered 1 to 7 is true to the best of my knowledge and belief; and
- (2) I make this statement knowing that if it were admitted as evidence, I may be liable to prosecution for stating in it anything I know to be false.

and I make this solemn declaration conscientiously believing the same to be true and virtue of the provisions of the Oaths Act 1867

.....Signature

Taken and declared before me at Brisbane

this 10th day of September 2004

Witness .....  
  
Justice of the Peace  
Commissioner of Magistrates  
Other (Please State).....

State v. Watson  
003497



2 Smith Street, REDBANK, QLD 4301, Australia  
PO Box 467, GOODNA, QLD, 4300 Australia  
Telephone +61 7 3810 6333 Facsimile +61 7 3810 6363  
ABN 83 705 537 586

A business unit of the Department of  
**Natural Resources and Mines**

## Laboratory Test Report

Report Number	OL75572F1
Issue Date	4 December 2003
Report To	Queensland Police Service Brisbane
Client Reference	Property Tag A837198 - Cylinder No. SF9682
Job Description	Compressed Gas Analysis
Date Received	18 November 2003
Date Conducted/Completed	25 November 2003
Responsibility for Sampling	Client
Approved Signatory	Samantha Forster Senior Chemist

State v. Watson  
003498

Unless otherwise indicated responsibility for sampling rests with the client. Where test items are submitted by the client results expressed in this report relate only to test items as received.  
This document may not be reproduced except in full or used in any way for advertising purposes without the written approval of the Laboratory.

Quality System Certification Number: 6039 (Certified to AS/NZS ISO 9001).





REPORT NO: OL75572F1

**CODE OF PRACTICE**

The Industry Code of Practice for Compressed Air Recreational Diving and Recreational Snorkelling<sup>1</sup> states the air used in SCUBA cylinders should:-

- Have no objectionable or nauseous odour;
- Contain not more than 5ppm of carbon monoxide
- Contain not more than 480ppm of carbon dioxide
- Contain not more than 0.3 mg/m<sup>3</sup> of oil
- The water content in steel cylinders should be monitored to reduce corrosion of cylinders.

**RESULTS**

Laboratory Number	OL75572/01	Limit of Reporting
Sample ID	Cylinder SF9682	
Components	% by vol	
Hydrogen	< 0.001	0.001
Oxygen	20.7	0.1
Nitrogen	78.3	0.1
Methane	< 0.01	0.01
Carbon Monoxide	< 0.0005	0.0005
Carbon Dioxide	0.06	0.01
Ethylene	< 0.002	0.002
Ethane	< 0.002	0.002
Argon*	0.9	0.1

\* Argon is a calculated value based on Nitrogen concentration.  
Carbon monoxide confirmed using API Gas Filter Correlation CO analyser.

Laboratory Number	Sample ID	Water (mg/m <sup>3</sup> )	Oil (mg/m <sup>3</sup> )
OL74971/01	Cylinder SN2918	50	Negative
Limit of Detection		5	dependant on oil type
Temperature		20°C	20°C

Oil type unknown as determined by client. Results for water and oil concentration are qualitative only.

Unless otherwise indicated responsibility for sampling rests with the client. Where test items are submitted by the client results expressed in this report relate only to test items as received.  
This document may not be reproduced except in full or used in any way for advertising purposes without the written approval of the Laboratory.  
Quality System Certification Number: 6039 (Certified to AS/NZS ISO 9001).



REPORT NO: OL75572F1

**REFERENCES**

1. Workplace Health and Safety; Industry Code of Practice for Compressed Air Recreational Diving and Recreational Snorkeling - Effective 1 February 2000 to 31 January 2005.
2. Simtars Laboratory Procedure LP0043 - "Procedure For Analysis Of General Permanent Gases Using HP Quad Gas Chromatograph".
3. Simtars Laboratory Procedure LP0017 - "Preparation of Standard Gas Mixtures. Laboratory Procedure for Preparation of Standard Gas Mixtures by Wosthoff Pump".
4. Bauer AIRLAB Electronic IV Air Quality Test Set. Oil determined by Drager tube Oil 10/a-P, Water by Drager tube Water Vapour 5/a-P.

**Oaths Act Declaration**

**OATHS ACT 1867 (DECLARATION)**

I, Tony Kelly..... do solemnly and sincerely declare that:

(1) This written statement by me dated 4 December 2003 and contained in pages numbered 1 to 3 is true to the best of my knowledge and belief; and

(2) I make this statement knowing that if it were admitted as evidence, I may be liable to prosecution for stating in it anything I know to be false.

and I make this solemn declaration conscientiously believing the same to be true and virtue of the provisions of the Oaths Act 1867

.....Signature

Taken and declared before me at REDBANK QUEENSLAND

this 15<sup>th</sup> day of SEPTEMBER 2004

Witness David Thomas JP Qld 15/09/2004

(Justice of the Peace / JP) Qld

Commissioner of Declarations

Other (Please State) .....

Unless otherwise indicated responsibility for sampling rests with the client. Where test items are submitted by the client results expressed in this report relate only to test items as received.  
This document may not be reproduced except in full or used in any way for advertising purposes without the written approval of the Laboratory.  
Quality System Certification Number: 6039 (Certified to AS/NZS ISO 9001).