

Beech-Fraser J

DEFENCE OF THIRD DEFENDANT

COURT DETAILS

Court Supreme Court of New South Wales
Division Common Law
Registry Sydney
Case number 2014/200854

FILED

- 7 SEP 2015



TITLE OF PROCEEDINGS

Plaintiff **Rodriguez & Sons Pty Ltd (ACN 108 770 681)**
First Defendant **Queensland Bulk Water Supply Authority trading as Seqwater**
Number of defendants **3**

FILING DETAILS

Filed for State of Queensland, Third Defendant
Filed in relation to Plaintiff's claim
Legal representative Crown Solicitor, Queensland
Legal representative reference PRE052/1942
Contact name and telephone Mr Chris Gasteen, (07) 3239 0292
Contact email chris.gasteen@crownlaw.qld.gov.au

PLEADINGS AND PARTICULARS

1. As to paragraph 1 of the Further Amended Statement of Claim (**Statement of Claim**), the third defendant (**the State**):
 - (a) admits sub-paragraph 1(a);
 - (b) does not admit sub-paragraphs 1(b) and 1(c).
2. The State admits paragraph 2 of the Statement of Claim.
3. The State admits paragraph 3 of the Statement of Claim.
4. The State admits paragraph 4 of the Statement of Claim.

Group Members and Common Questions

5. As to paragraph 5 of the Statement of Claim, the State:

- (a) admits that in January 2011, the Brisbane and Bremer Rivers and their tributaries flooded causing substantial inundation to areas located downstream of Wivenhoe Dam;
 - (b) does not admit that such inundation occurred in the period 9 to 24 January 2011;
 - (c) says that the flood level in the Brisbane River peaked at the Brisbane Port Office gauge at about 4.46 m Australian Height Datum (**AHD**) on Thursday, 13 January 2011 at about 03:00 and thereafter receded to about 1.1 m AHD on Sunday, 16 January 2011 at about midnight;
 - (d) does not admit that the areas of inundation caused by flooding of the Brisbane and Bremer Rivers and their tributaries are as indicated on the map referred to in the particulars to paragraph 5 of the Statement of Claim.
6. As to paragraphs 6, 7, 8, 9 and 10 of the Statement of Claim, the State:
- (a) does not know the identity of the Group Members having sought, but been refused, particulars of the Group Members;
 - (b) by reason of (a), does not admit the allegations.

Somerset Dam

- 7. The State admits paragraph 11 of the Statement of Claim.
- 8. The State admits paragraph 12 of the Statement of Claim.
- 9. The State admits paragraph 13 of the Statement of Claim.
- 10. The State admits paragraph 14 of the Statement of Claim.
- 11. The State admits paragraph 15 of the Statement of Claim.
- 12. The State admits paragraph 16 of the Statement of Claim.
- 13. As to paragraphs 17 and 18 of the Statement of Claim, the State:
 - (a) says that:
 - (i) there is a risk of cavitation damage to the cone dispersion valves when the level of Lake Wivenhoe produces tail waters more than elevation level 68.6 m AHD ("EL") below Lake Somerset;
 - (ii) in practice the cone dispersion valves were not used when the tail waters of Lake Wivenhoe rose above EL 68.6;
 - (b) otherwise admits the allegations.
- 14. As to paragraph 19 of the Statement of Claim, the State:

- (a) repeats and relies upon the matters stated in response to paragraphs 127 to 129 of the Statement of Claim below;
 - (b) says that:
 - (i) prior to December 2010 there had been a number of engineering assessments of the capabilities of Somerset Dam as a result of which there was uncertainty as to the security of the dam at high lake levels;
 - (ii) if Somerset Dam failed that could cause a cascading failure of Wivenhoe Dam resulting in devastating downstream flooding;
 - (c) Mr Ruffini was aware of the facts and matters pleaded in preceding subparagraph in December 2010 and January 2011;
 - (d) otherwise admits the allegations.
15. As to paragraph 20 of the Statement of Claim, the State:
- (a) admits that the Full Supply Level (**FSL**) of Lake Somerset was EL 99.0;
 - (b) says that the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam, Revision 7, November 2009 (**Flood Mitigation Manual**) defines the FSL as *"the level of the water surface when the reservoir is at maximum operating level, excluding periods of flood discharge"*;
 - (c) otherwise denies the allegations.
16. The State admits paragraph 21 of the Statement of Claim.
17. As to paragraph 22 of the Statement of Claim, the State:
- (a) admits that the capacity of the flood storage compartment of Lake Somerset was approximately 524,000 ML taking the upper limit as the crest level of Somerset Dam (being approximately EL 107.5);
 - (b) says that when the water level of Somerset Dam is at FSL the flood storage compartment is empty;
 - (c) otherwise denies the allegations.
18. The State admits paragraph 23 of the Statement of Claim.
19. The State admits paragraph 24 of the Statement of Claim.
20. The State admits paragraph 25 of the Statement of Claim.
21. As to paragraph 26 of the Statement of Claim:

- (a) does not admit that in December 2010 and January 2011 Somerset Dam had the capacity to withstand overtopping;
 - (b) admits that Somerset Dam was designed to withstand limited overtopping over the radial gates but not over the top deck of the Dam;
 - (c) repeats and relies upon the matters pleaded in response to paragraph 19 to the Statement of claim.
22. As to paragraph 27 of the Statement of Claim, the State:
- (a) says that EL 109.7 represented the likely failure level for Somerset Dam assuming all gates are fully open;
 - (b) repeats and replies upon the matters pleaded in response to paragraphs 19 and 26 of the Statement of Claim above;
 - (c) otherwise admits the allegations.

Wivenhoe Dam

23. The State admits paragraph 28 of the Statement of Claim.
24. The State admits paragraph 29 of the Statement of Claim.
25. As to paragraph 30 of the Statement of Claim, the State:
- (a) denies the allegation that water in Lake Wivenhoe abuts the face of Somerset Dam when Lake Wivenhoe is at FSL;
 - (b) otherwise admits the allegations.
26. The State admits paragraph 31 of the Statement of Claim.
27. The State admits paragraph 32 of the Statement of Claim.
28. The State admits paragraph 33 of the Statement of Claim.
29. The State admits paragraph 34 of the Statement of Claim.
30. The State admits paragraph 35 of the Statement of Claim.
31. The State admits paragraph 36 of the Statement of Claim.
32. The State admits paragraph 37 of the Statement of Claim.
33. The State admits paragraph 38 of the Statement of Claim.
34. The State admits paragraph 39 of the Statement of Claim.
35. The State admits paragraph 40 of the Statement of Claim.

36. The State admits paragraph 41 of the Statement of Claim.
37. As to paragraph 42 of the Statement of Claim, the State:
- (a) says that the flood travel time from Wivenhoe Dam to Brisbane City is approximately 26 hours, but may depend upon a variety of factors including flood magnitude;
 - (b) otherwise denies the allegation.
38. As to paragraph 43 of the Statement of Claim, the State:
- (a) denies that Lake Wivenhoe has a compartment described as a "drinking water storage compartment";
 - (b) says that the compartment other than flood storage is properly to be described as that to be used for "supply";
 - (c) says that when the water level of Wivenhoe Dam is at FSL the flood storage compartment is empty;
 - (d) otherwise admits the allegations.
39. As to paragraph 44 of the Statement of Claim, the State:
- (a) denies the allegations;
 - (b) says that Wivenhoe Dam was not designed for hydroelectric power generation.
40. The State admits paragraph 45 of the Statement of Claim.
41. As to paragraph 46 of the Statement of Claim, the State:
- (a) admits that the Primary and the Auxiliary Spillways have elements of concrete embedded within a portion of the earthen embankment of Wivenhoe Dam;
 - (b) says that the spillways are constructed as depicted at pages 71 and 73 of the Flood Mitigation Manual;
 - (c) otherwise denies the allegations.
42. The State admits paragraph 47 of the Statement of Claim.
43. As to paragraph 48 of the Statement of Claim, the State:
- (a) admits the characteristics and capabilities of the Primary Spillway at Wivenhoe Dam enable the dam operator to engage in active flood mitigation by controlling the amount of outflow from the Primary Spillway;

- (b) says that the Flood Mitigation Manual directs the manner in which the Flood Engineers are to operate the Primary Spillway;
- (c) otherwise denies the allegations.
44. The State admits paragraph 49 of the Statement of Claim.
45. As to paragraph 50 of the Statement of Claim, the State:
- (a) admits that the erodible fuse plugs in the Auxiliary Spillway are designed so that, before Wivenhoe Dam overtops, the fuse plugs erode;
- (b) otherwise denies the allegations.
46. As to paragraph 51 of the Statement of Claim, the State:
- (a) repeats and relies upon its response to paragraph 50 of the Statement of Claim above;
- (b) otherwise admits the allegations.
47. The State admits paragraph 52 of the Statement of Claim.
48. The State admits paragraph 53 of the Statement of Claim.

Flood Mitigation

49. As to paragraphs 54, 55, 56, 57, 58 and 59 of the Statement of Claim, the State:
- (a) says that the Flood Mitigation Manual materially contained the following provisions:

1. INTRODUCTION

1.1 Preface

Given their potential significant impact on downstream populations, it is imperative that Wivenhoe and Somerset Dams be operated during flood events in accordance with clearly defined procedures to minimise impacts to life and property. This manual outlines these procedures and is an approved Flood Mitigation Manual under Water Supply Act 2008.

...

The primary objectives of the procedures contained in this Manual are essentially the same as those contained in previous Manual versions. These objectives in order of importance are:

- *Ensure the structural safety of the dams;*
- *Provide optimum protection of urbanised areas from inundation;*
- *Minimise disruption to rural life in the valleys of the Brisbane and Stanley Rivers;*
- *Retain the storage at Full Supply Level at the conclusion of the Flood Event.*
- *Minimise impacts to riparian flora and fauna during the drain down phase of the Flood Event.*

In meeting these objectives, the dams must be operated to account for the potential effects of closely spaced Flood Events. Accordingly, normal procedures require stored floodwaters to be emptied from the dams within seven days of the flood event peak passing through the dams.

Wivenhoe Dam and Somerset Dam are operated in conjunction so as to maximise the overall flood mitigation capabilities of the two dams. The procedures outlined in this Manual are based on the operation of the dams in tandem.

...

1.3 Purpose of Manual

The purpose of this Manual is to define procedures for the operation of Wivenhoe Dam and Somerset Dam to reduce, so far as practicable, the effects of flooding associated with the dams. This is achieved by the proper control and regulation in time of the flood release infrastructure at the dams, with due regard to the safety of the dam structures.

The procedures in this Manual have been developed on the basis that the community is to be protected to the maximum extent practical against flood hazards recognising the limitations on being able to:

- *Obtain accurate forecasts of rainfall during flood events;*
- *Accurately estimate flood run-off within the dam catchments;*
- *Identify all potential flood hazards and their likelihood;*
- *Remove or reduce community vulnerability to flood hazards;*
- *Effectively respond to flooding;*
- *Provide resources in a cost effective manner.*

...

1.5 Application and Effect

The procedures in this Manual apply to the operation of Wivenhoe Dam and Somerset Dam for the purpose of flood mitigation, and operation in accordance with the manual shall give the protection from liability provided by Section 374 of the Act.

...

1.7 Observance of Manual

This Manual contains the operational procedures for Wivenhoe Dam and Somerset Dam for the purposes of flood mitigation and must be used for the operation of the dams during flood events.

...

2. DIRECTION OF OPERATIONS

2.1 Statutory Operation

Pursuant to the provisions of the Act, Seqwater is responsible for operating and maintaining the dams in accordance with this Manual in order to retain the protection from liability afforded by the Act. Operators, employees, agents, and contractors working for Seqwater must also comply with this Manual to obtain the protection of the Act.

...

3. FLOOD MITIGATION OBJECTIVES

3.1 General

To meet the purpose of the flood operational procedures in this Manual, the following objectives, listed in descending order of importance, are as follows:

- *Ensure the structural safety of the dams;*
- *Provide optimum protection of urbanised areas from inundation;*
- *Minimise disruption to rural life in the valleys of the Brisbane and Stanley Rivers;*

- *Retain the storage at Full Supply Level at the conclusion of the Flood Event.*
- *Minimise impacts to riparian flora and fauna during the drain down phase of the Flood Event.*

In meeting these objectives, the dams must be operated to account for the potential effects of closely spaced Flood Events. Accordingly, normal procedures require stored floodwaters to be emptied from the dams within seven days of the flood event peak passing through the dams.

Additionally, the auxiliary spillway constructed at Wivenhoe Dam in 2005 incorporates fuse plugs. Triggering of a fuse plug will increase floods levels downstream. Where possible, gate operations at both Wivenhoe and Somerset dams should be formulated to prevent operation of the fuse plug. This potential scenario is possible only when the forecast peak water level for Wivenhoe Dam just exceeds the trigger level for the fuse plug and sufficient time is available to alter releases.

3.2 Structural Safety of Dams

The structural safety of the dams must be the first consideration in the operation of the dams for the purpose of flood mitigation.

...

Extreme Floods and Closely Spaced Large Floods

... The discharges from the dams should be regulated so as to have little impact on the urban reaches of the Brisbane River, taking into account inflows into the river downstream of the dams. However, the seven day drainage requirement may result in submergence of some bridges. Regardless, the level of flooding as a result of emptying stored floodwaters after the peak has passed is to be less than the flood peak unless accelerated release is necessary to reduce the risk of overtopping.

3.3 Inundation of Urban Areas

... The peak flows of floods emanating from the upper catchments of Brisbane and Stanley Rivers can be reduced by controlling flood releases from the dams, while taking into account flooding derived from the lower Brisbane River catchments.

3.4 Disruption to Rural Areas

... The operation of the dams should not prolong this inundation unnecessarily. ...

3.5 Retain the storage at Full Supply Level at the Conclusion of the Flood Event

As the dams are the primary urban water supply for South East Queensland, it is important that all opportunities to fill the dams are taken. There should be no reason why the dams should not be full following a Flood Event.

3.6 Minimising Impacts to Riparian Flora and Fauna

During the drain down phase, consideration is to be given to minimising the impacts on riparian flora and fauna. In particular, strategies aimed at reducing fish deaths in the vicinity of the dam walls are to be instigated, provided such procedures do not adversely impact on other flood mitigation objectives. Additionally, when determining the time interval between successive gate closures consideration should also be given to reducing potential bank slumping. Rapid draw down of stream levels where banks are saturated

should be avoided if this can be managed within the other flood mitigation objectives.

...

5. FLOOD MONITORING AND FORECASTING SYSTEM

...

5.2 Operation

The Senior Flood Operations and Flood Operations Engineers use the RTFM for flood monitoring and forecasting during flood events to operate the dams in accordance with this Manual. This is done by optimising releases of water from the dams to minimise the impacts of flooding in accordance with the objectives and procedures contained in this Manual.

...

8. WIVENHOE DAM FLOOD OPERATIONS

8.1 Introduction

... Maximum overall flood mitigation effect will be achieved by operating Wivenhoe Dam in conjunction with Somerset Dam.

The reservoir volume above FSL of EL 67.0 is available as temporary flood storage. How much of the available flood storage compartment is utilised, will depend on the initial reservoir level below FSL, the magnitude of the flood being regulated and the procedures adopted.

...

8.3 Initial Flood Control Action

Once a Flood Event is declared, an assessment is to be made of the magnitude of the Flood Event, including:

- A prediction of the maximum storage levels in Wivenhoe and Somerset Dams.
- A prediction of the peak flow rate at the Lowood Gauge excluding Wivenhoe Dam releases.
- A prediction of the peak flow rate at the Moggill Gauge excluding Wivenhoe Dam releases.

The spillway gates are not to be opened for flood control purposes prior to the reservoir level exceeding EL 67.25.

8.4 Flood Operations Strategies

There are four strategies (W1 to W4) used when operating Wivenhoe Dam during a flood event as outlined below. These strategies are based on the Flood Objectives of this manual. As outlined in Section 3, the objectives, listed in descending order of importance, are as follows:

- Ensure the structural safety of the dams;
- Provide optimum protection of urbanised areas from inundation;
- Minimise disruption to rural life in the valleys of the Brisbane and Stanley Rivers;
- Retain the storage at Full Supply Level at the conclusion of the Flood Event.
- Minimise impacts to riparian flora and fauna during the drain down phase of the Flood Event.

Within any strategy, consideration is always given to these objectives in this order, when making decisions on dam releases.

The strategy chosen at any point in time will depend on the actual levels in the dams and the following predictions, which are to be made using the best forecast rainfall and stream flow information available at the time:

- Maximum storage levels in Wivenhoe and Somerset Dams.

- Peak flow rate at the Lowood Gauge (excluding Wivenhoe Dam releases).
- Peak flow rate at the Moggill Gauge (excluding Wivenhoe Dam releases).

Strategies are likely to change during a flood event as forecasts change and rain is received in the catchments. It is not possible to predict the range of strategies that will be used during the course of a flood event at the commencement of the event. Strategies are changed in response to changing rainfall forecasts and stream flow conditions to maximise the flood mitigation benefits of the dams.

When determining dam outflows within all strategies, peak outflow should generally not exceed peak inflow. ...

8.5 Gate Closing Strategies

In general, gate closing commences when the level in Wivenhoe Dam begins to fall and is generally to occur in the reverse order to opening. The final gate closure should occur when the lake level has returned to Full Supply Level. The following requirements must be considered when determining gate closure sequences:

- Where possible, total releases during closure should not produce greater flood levels downstream than occurred during the flood event.
- The maximum discharge from the dam during closure should generally be less than the peak inflow into Wivenhoe Dam experienced during the event. The discharge from Wivenhoe Dam includes discharge from triggered fuse plugs, gates, regulator cone dispersion valve and hydro release.
- If, at the time the lake level in Wivenhoe Dam begins to fall, the combined flow at Lowood is in excess of 3,500 m³/s then the combined flow at Lowood is to be reduced to 3,500 m³/s as quickly as practicable.
- The aim should always be to empty stored floodwaters stored above EL 67.0m within seven days after the flood peak has passed through the dams. However, provided a favourable weather outlook is available, this requirement can be relaxed for the volume between EL 67.0m and EL 67.5m, to obtain positive environmental outcomes.
- If the flood storage compartments of Wivenhoe Dam and Somerset Dam can be emptied within seven days, the maximum flow in the Brisbane River at Lowood should not exceed 3,500m³/s.
- To minimise the stranding of fish downstream of the dam, final closure sequences should consider Seqwater policies relating to fish protection at the dam.

There may be a need to take into account base flow when determining final gate closure. This may mean that the lake level temporarily falls below Full Supply Level to provide for a full dam at the end of the Flood Event.

8.6 Gate Operation Sequences

Radial Gate Opening Operations

When dam outflows are less than 4,000m³/s, rapid opening of the radial gates can cause undesirable rapid rises in downstream river levels. Accordingly, when dam outflows are less than 4,000m³/s, the aim in opening radial gates is to operate the gates one at a time at intervals that will minimise adverse impacts on the river system. The table below shows the target minimum interval for gate operations in these circumstances. This target interval can

be reduced if the gates are at risk of being overtopped or the safety of the dam is at risk.

...

Normal Gate Operation Sequences

Under normal operation, only one gate is to be opened at any one time and the sequences shown in the table below are to be adopted. Generally gates are operated in the order of 3, 2, 4, 1, 5. Variations are allowed at any time to protect the structural safety of the dam.

...

9 SOMERSET DAM FLOOD OPERATIONS

9.1 Introduction

Somerset Dam is capable of being operated in a number of ways to regulate Stanley River floods. Somerset Dam and Wivenhoe Dam are to be operated in conjunction to optimise the flood mitigation benefits downstream of Wivenhoe Dam. ...

9.2 Initial Flood Control Action

Once a Flood Event is declared, all radial gates are to be fully opened and all sluice gates and regulator valves are to be fully closed. An assessment is to be made of the magnitude of the Flood Event, including a prediction of the maximum storage levels in Wivenhoe and Somerset Dams.

9.3 Flood Operations Strategies

There are three strategies used when operating Somerset Dam during a flood event as outlined below. These strategies are based on the Flood Objectives of this manual. The strategy chosen at any point in time will depend on predictions of the maximum storage levels in Wivenhoe and Somerset Dams which are to be made using the best forecast rainfall and stream flow information available at the time.

Strategies are likely to change during a flood event as forecasts change and rain is received in the catchments. It is not possible to predict the range of strategies that will be used during the course of a flood event at the commencement of the event. Strategies are changed in response to changing rainfall forecasts and stream flow conditions to maximise the flood mitigation benefits of the dams.

When calculating the impacts of flood releases from Somerset Dam, the gate opening sequences outlined in Section 9.5 should be used to determine likely outflow rates from the dam.

A flow chart showing how best to select the appropriate strategy to use at any point in time is shown below:

...

- (b) subject to complying with the provisions of the Flood Mitigation Manual referred to in sub-paragraph (a) above, admits that:
 - (i) the two principal tools available to the operators of Somerset Dam and Wivenhoe Dam to achieve flood mitigation are water storage and water releases;

- (ii) Somerset Dam and Wivenhoe Dam can be operated to mitigate flooding downstream of Wivenhoe Dam by adopting the strategies for the operation of those dams provided for in the Flood Mitigation Manual which, depending upon the strategy to be adopted, may include:
 - (1) storing inflows in Lake Somerset;
 - (2) storing inflows in Lake Wivenhoe;
 - (3) regulating the rates and timing of outflows from Wivenhoe Dam;
 - (4) regulating the rates and timing of outflows from Somerset Dam in conjunction with the operation of Wivenhoe Dam;
- (c) admits that the flood mitigation capabilities of Somerset Dam and Wivenhoe Dam are maximised by operating the two dams in conjunction during Flood Operations in the manner described in the Flood Mitigation Manual;
- (d) says that at a height of EL 107.45 water commences to flow over the Somerset Dam crest gates;
- (e) says that the peak level of Somerset Dam cannot exceed EL 109.7;
- (f) repeats and relies upon the matters pleaded in response to paragraph 19 of the Statement of Claim above;
- (g) says that when the water level of Wivenhoe Dam reaches EL 74.0 Strategy W4 normally comes into effect;
- (h) says that the intent of Strategy W4 is to ensure the safety of the dam while limiting downstream impacts as much as possible;
- (i) says that under Strategy W4 the release rate is increased as the safety of the dam becomes a priority and that opening of the gates is to occur generally in accordance with the requirements of Section 8.6 of the Flood Mitigation Manual until the storage level of Wivenhoe Dam begins to fall;
- (j) says that there are no restrictions on gate opening increments or gate operating frequency once the storage level in Wivenhoe Dam exceeds EL 74.0;
- (k) says that Flood Operations for Somerset Dam and Wivenhoe Dam require that the dam operators determine, and act in accordance with, release strategies taking into account, among other things:
 - (i) the levels in Lake Somerset and Lake Wivenhoe;
 - (ii) the available capacity in the flood storage compartments of each dam;

- (iii) current and forecast inflows into Lake Somerset and Lake Wivenhoe;
- (iv) current and forecast inflows into the Brisbane River downstream of Wivenhoe Dam;
- (v) current and forecast rainfall in the Lake Somerset and Lake Wivenhoe catchments;
- (vi) current and forecast rainfall directly over Lake Somerset or Lake Wivenhoe;
- (vii) the obligation under the Flood Mitigation Manual not to reduce the level of the dams below FSL;
- (viii) current and forecast rainfall in the Brisbane River catchment areas not controlled by the dams including Lockyer Creek and Bremer River Catchments which:
 - (1) cover an area in the order of 6,500 km² being approximately half of the Brisbane River catchment;
 - (2) may vary in intensity, duration and distribution;
- (ix) the necessity to give emergency and other authorities and the public sufficient time to prepare for community isolations, the closure of bridges and roads, and to undertake evacuations;
- (l) otherwise denies the allegations.

50. The State admits paragraph 60 of the Statement of Claim.

Seqwater's Ownership and Control of Somerset Dam and Wivenhoe Dam

51. The State admits paragraph 61 of the Statement of Claim.

52. The State admits paragraph 62 of the Statement of Claim.

53. The State admits paragraph 63 of the Statement of Claim.

54. The State admits paragraph 64 of the Statement of Claim.

55. The State admits paragraph 65 of the Statement of Claim.

56. The State admits paragraph 66 of the Statement of Claim.

57. The State admits paragraph 67 of the Statement of Claim.

58. As to paragraphs 68 and 69 of the Statement of Claim, the State admits section 13 of the Moreton ROP was to the effect stated.
59. As to paragraph 70 of the Statement of Claim, the State:
- (a) says that the Statement of Current Programs to which reference is made, was:
 - (i) for the purposes of section 13(3)(a) of the Moreton ROP;
 - (ii) the first step towards obtaining the Chief Executive's approval of an Interim Program under section 13 of the Moreton ROP;
 - (b) otherwise admits the allegations.
60. As to paragraphs 71 and 72 of the Statement of Claim, the State:
- (a) admits the Statement of Current Programs submitted on 4 February 2010:
 - (i) recorded and proposed the matters referred to sub-paragraphs 71(a) and (b) of the Statement of Claim;
 - (ii) was approved by the delegate of the Chief Executive of DERM on or about 12 March 2010;
 - (b) repeats and relies upon the matters stated in the preceding paragraph in response to paragraph 70 of the Statement of Claim above;
 - (c) otherwise denies the allegations.
61. As to paragraph 73 of the Statement of Claim, the State:
- (a) admits that, on or about 27 August 2010, Seqwater sought approval from the Chief Executive of DERM for an interim program under section 13(3)(b) of the Moreton ROP;
 - (b) says that:
 - (i) such program was not an "updated" interim program;
 - (ii) there existed no lawful authority (in the Moreton ROP or otherwise) for an interim program to be updated or amended by a person other than the Chief Executive;
 - (c) otherwise denies the allegations.
62. As to paragraph 74 of the Statement of Claim, the State:
- (a) says that the source of rules governing the release of water for flood mitigation purposes was the Flood Mitigation Manual;

- (b) otherwise denies the allegations.
- 63. The State admits paragraph 75 of the Statement of Claim.
- 64. The State denies the allegations in paragraph 76 of the Statement of Claim.

SunWater's Control of Somerset Dam and Wivenhoe Dam

- 65. The State does not admit paragraph 77 of the Statement of Claim.
- 66. The State does not admit paragraph 78 of the Statement of Claim.
- 67. The State does not admit paragraph 79 of the Statement of Claim.
- 68. The State does not admit paragraph 80 of the Statement of Claim.
- 69. The State does not admit paragraph 81 of the Statement of Claim.
- 70. The State does not admit paragraph 82 of the Statement of Claim.
- 71. The State does not admit paragraph 83 of the Statement of Claim.
- 72. The State does not admit paragraph 84 of the Statement of Claim.

The Flood Mitigation Manual

- 73. As to paragraph 85 of the Statement of Claim, the State:
 - (a) says that the Flood Mitigation Manual was:
 - (i) the Revision 7 of the Flood Mitigation Manual, the previous iterations of the Flood Mitigation Manual being dated 27 October 1968 (Revision 0); 6 October 1992 (Revision 1); 13 November 1997 (Revision 2); 24 August 1998 (Revision 3); 6 September 2002 (Revision 4); 4 October 2004 (Revision 5) and 20 December 2004 (Revision 6);
 - (ii) based upon the previous iterations of the Flood Mitigation Manual referred to in sub-paragraph (a)(i) above;
 - (iii) prepared under s 370 of the *Water Supply (Safety and Reliability) Act 2008 (Qld) (Water Supply Act)*;
 - (iv) submitted to the Chief Executive for approval under s 371 of that Act;
 - (v) approved under that Act on 22 December 2009;
 - (b) says that the Flood Mitigation Manual was a technical document drafted by engineers and addressed to, and intended to be interpreted by, experienced engineers trained in respect of, and familiar with, Somerset Dam and Wivenhoe Dam, the dam catchments and operation of those dams;

- (c) says that properly interpreted, the Flood Mitigation Manual did not:
 - (i) authorise, permit or require the Flood Engineers to reduce the levels of the dams below FSL in the manner alleged in the Statement of Claim;
 - (ii) require the Flood Engineers to make operational decisions in relation to releases of water in the dams based upon weather forecasts in the manner alleged in the Statement of Claim;
- (d) in the alternative, says that an interpretation of the Flood Mitigation Manual that it did not:
 - (i) authorise, permit or require the Flood Engineers to reduce the levels of the dams below FSL in the manner alleged in the Statement of Claim;
 - (ii) require the Flood Engineers to make operational decisions in relation to releases of water in the dams based upon weather forecasts in the manner alleged in the Statement of Claim,

was an interpretation that was within the range of reasonable interpretations open to experienced engineers in the field of dam operations;
- (e) otherwise admits the allegations.

74. As to paragraph 86 of the Statement of Claim, the State:

- (a) admits that the Flood Engineers were required to adhere to the terms of the Flood Mitigation Manual;
- (b) says that the obligation of the Flood Engineers to adhere to the terms of the Flood Mitigation Manual derived from:
 - (i) the terms of the Flood Mitigation Manual pleaded in sub-paragraph 19(a) above;
 - (ii) the *Water Supply Act*;
- (c) otherwise does not admit the allegations, being directed to the First and Second Defendants.

75. As to paragraph 87 of the Statement of Claim, the State:

- (a) says that the purpose of the Flood Mitigation Manual was as stated in the Flood Mitigation Manual Sections 1.1 and 1.3;
- (b) otherwise denies the allegations.

76. As to paragraph 88 of the Statement of Claim, the State:

- (a) says that the objectives of the Flood Mitigation Manual were as stated in the Flood Mitigation Manual Sections 1.1, 3, 8 and 9;
- (b) otherwise denies the allegations.

77. As to paragraph 89 of the Statement of Claim, the State:

- (a) says that the Flood Mitigation Manual:
 - (i) in Sections 3.1 and 3.2, relevantly provided as stated in response to paragraphs 54 to 59 of the Statement of Claim above;
 - (ii) in Appendix G, relevantly provided as follows:

Floods in the Brisbane River catchment above Wivenhoe Dam can originate in either the Stanley River or upper Brisbane River catchment or both. Both of the dams are capable of being operated in a number of ways, each of which will reduce the flow downstream. Indicative inflows for the dams for 48 hour storm events (the critical duration for Wivenhoe Dam) are shown in the graph below ...

- (b) otherwise denies the allegations.

78. As to paragraph 90 of the Statement of Claim, the State:

- (a) says that the Flood Mitigation Manual relevantly provided in Sections 1.2 and 2.3, as follows:

"Senior Flood Operations Engineer" means a person designated in accordance with Section 2.3 of this Manual under whose general direction the procedures in this Manual must be carried out.

2.3 Designation and Responsibilities of Senior Flood Operations Engineer

Seqwater must nominate one or more suitably qualified and experienced persons to undertake the role of Senior Flood Operations Engineer. If approved by the Chief Executive, these persons can be authorised in the Schedule of Authorities (see Section 2.6). When rostered on duty during a Flood Event, the responsibilities of the Senior Flood Engineer are as follows:

- *Set the overall strategy for management of the Flood Event in accordance with the objectives of this Manual.*
- *Provide instructions to site staff to make releases of water from the Dams during Flood Events that are in accordance with this Manual.*
- *Apply reasonable discretion in managing a Flood Event as described in Section 2.8.*

- (b) otherwise denies the allegations.

79. As to paragraph 91 of the Statement of Claim, the State:

- (a) says that Mr Ruffini was approved by the Chief Executive to act as Senior Flood Operations Engineer and could act as the designated Senior Flood Operations Engineer when authorised to do so;
 - (b) says that Mr Ruffini acted in the position of Senior Flood Operations Engineer between at about 16:00 on 10 December 2010 and on or about 18 December 2010 when Mr Ayre was on leave;
 - (c) with the exception of the period between at about 16:00 on 10 December 2010 and on or about 18 December 2010, denies that Mr Ruffini was designated to perform the function of Senior Flood Operations Engineer;
 - (d) says that at all material times in December 2010 and January 2011 (save for a period when he was on leave between on or about 10 December 2010 and on or about 18 December 2010), Mr Ayre was the designated Senior Flood Operations Engineer and fulfilled the functions of that position;
 - (e) otherwise denies the allegations in so far as those allegations relate to Mr Ruffini.
80. As to paragraph 92 of the Statement of Claim, the State:
- (a) admits the allegations contained in the second sub-paragraph "a" (*sic*);
 - (b) otherwise does not admit the allegations.
81. As to paragraph 93 of the Statement of Claim, the State:
- (a) says that the services of Mr Ruffini were provided to SunWater pursuant to a Memorandum of Understanding dated in or about February 2001 (**MOU**);
 - (b) the MOU recorded, *inter alia*, that:
 - (i) the Department of Natural Resources (DNR) would provide the services of Mr Ruffini to SunWater to undertake duties defined in Schedule 1 to the MOU;
 - (ii) by Schedule 1 to the MOU, Mr Ruffini was to perform his duties as Flood Operations Engineer on behalf of SunWater;
 - (c) otherwise admits the allegation.
82. As to paragraph 94 of the Statement of Claim, the State:
- (a) says that the Flood Mitigation Manual relevantly provided:

- (i) in Section 2.3, as set out in response to paragraph 90 of the Statement of Claim above;
- (ii) in Sections 2.2 and 2.8 as follows:

2.2 Operational Arrangements

For the purposes of operation of the dams during Flood Events, Seqwater must ensure that:

...

- *A Senior Flood Operations Engineer is designated to be in the charge of Flood Operations at all times during a Flood Event.*

2.8 Reasonable Discretion

If in the opinion of the Senior Flood Operations Engineer, it is necessary to depart from the procedures set out in this Manual to meet the flood mitigation objectives set out in Section 3, the Senior Flood Operations Engineer is authorised to adopt such other procedures as considered necessary subject to the following:

- *Before exercising discretion under this Section of the Manual with respect to flood mitigation operations, the Senior Flood Operations Engineer must make a reasonable attempt to consult with both the Chairperson and Chief Executive;*
- *The Chief Executive would normally authorise any departures from the Manual. However if the Chief Executive cannot be contacted within a reasonable time, departures from the Manual can be authorised by Chairperson.*
- *If both the Chairperson and the Chief Executive cannot be contacted within a reasonable time, the Senior Flood Operations Engineer may proceed with the procedures considered necessary and report such action at the earliest opportunity to the Chairperson and Chief Executive.*

- (b) otherwise denies the allegations.

83. As to paragraph 95 of the Statement of Claim, the State:

- (a) says that the Flood Mitigation Manual relevantly provided in Sections 1.2 and 2.4 as follows:

1.2

"Flood Operations Engineer" means a person designated to direct flood operations at the dams in accordance with Section 2.4 of this Manual.

2.4 Designation and Responsibilities of Flood Operations Engineer

Seqwater must nominate one or more suitably qualified and experienced persons to undertake the role of Flood Operations Engineer. If approved by the Chief Executive, these persons can be authorised in the Schedule of Authorities (see Section.2.6). When rostered on duty during a Flood Event, the responsibilities of the Flood Engineer are as follows:

- *Direct the operation of the dams during a flood event in accordance with the general strategy determined by the Senior Flood Operations Engineer.*
- *Follow any direction from the Senior Flood Operations Engineer in relation to applying reasonable discretion in managing a Flood Event as described in Section 2.8. Unless otherwise directed, a Flood Operations Engineer is to follow this Manual in managing Flood Events and is not to apply reasonable discretion unless directed by the Senior Flood Operations Engineer or the Chief Executive.*
- *Provide instructions to site staff to make releases of water from the Dams during Flood Events that are in accordance with this Manual;*

...

(b) otherwise denies the allegations.

84. As to paragraph 96 of the Statement of Claim, the State:

(a) says that Mr Ruffini also was authorised to perform the function of a Flood Operations Engineer and acted in that capacity at all times when he was rostered on duty in the Flood Operations Centre between:

- (i) 2 and 10 December 2010;
- (ii) 18 December 2010 and 14 January 2011;

(b) otherwise admits the allegation.

85. The State admits paragraph 97 of the Statement of Claim.

86. As to paragraph 98 of the Statement of Claim, the State:

(a) repeats and relies upon the provisions of Section 2.4 of the Flood Mitigation Manual as set out in response to paragraph 95 of the Statement of Claim above;

(b) otherwise denies the allegations.

87. As to paragraph 99 of the Statement of Claim, the State:

(a) says that the Flood Mitigation Manual relevantly provided in Section 2.2 as set out in response to paragraph 94 of the Statement of Claim above and paragraph 100 of the Statement of Claim below;

(b) otherwise denies the allegations.

88. As to paragraph 100 of the Statement of Claim, the State:

(a) says that the Flood Mitigation Manual relevantly provided:

2.2 Operational Arrangements

...

- *A Duty Flood Operations Engineer is on call at all times. The Duty Flood Operations Engineer must constantly review weather forecasts and catchment rainfall and must declare a Flood Event if the water level of either*

Wivenhoe or Somerset Dam is expected to exceed Full Supply Level as a result of prevailing or predicted weather conditions.

...

- *Release of water at the dams during Flood Events is carried out under the direction of the Duty Flood Operations Engineer”;*

- (b) says that Section 2.4 of the Flood Mitigation Manual further relevantly provided as set out in response to paragraph 95 of the Statement of Claim above;
- (c) otherwise denies the allegations.

89. The State admits paragraph 101 of the Statement of Claim.

90. The State admits paragraph 102 of the Statement of Claim.

91. The State admits paragraph 103 of the Statement of Claim.

92. The State admits paragraph 104 of the Statement of Claim.

93. The State admits paragraph 105 of the Statement of Claim.

94. As to paragraphs 106 of the Statement of Claim, the State:

- (a) says that the Flood Mitigation Manual relevantly provided:

8.4 Flood Operations Strategies

There are four strategies (W1 to W4) used when operating Wivenhoe Dam during a flood event as outlined below. These strategies are based on the Flood Objectives of this manual. As outlined in Section 3, the objectives, listed in descending order of importance, are as follows:

- *Ensure the structural safety of the dams;*
- *Provide optimum protection of urbanised areas from inundation;*
- *Minimise disruption to rural life in the valleys of the Brisbane and Stanley Rivers;*
- *Retain the storage at Full Supply Level at the conclusion of the Flood Event.*
- *Minimise impacts to riparian flora and fauna during the drain down phase of the Flood Event.*

Within any strategy, consideration is always given to these objectives in this order, when making decisions on dam releases.

The strategy chosen at any point in time will depend on the actual levels in the dams and the following predictions, which are to be made using the best forecast rainfall and stream flow information available at the time:

- *Maximum storage levels in Wivenhoe and Somerset Dams.*
- *Peak flow rate at the Lowood Gauge (excluding Wivenhoe Dam releases).*
- *Peak flow rate at the Moggill Gauge (excluding Wivenhoe Dam releases).*

Strategies are likely to change during a flood event as forecasts change and rain is received in the catchments. It is not possible to predict the range of strategies that will be used during the course of a flood event at the commencement of the event. Strategies are changed in response to changing rainfall forecasts and stream flow conditions to maximise the flood mitigation benefits of the dams.

When determining dam outflows within all strategies, peak outflow should generally not exceed peak inflow. A flowchart showing how best to select the appropriate strategy to use at any point in time is shown below:

[flowchart not inserted but will be referred to and relied upon at the trial]

- (b) otherwise denies the allegations.
95. As to paragraphs 106A and 106B of the Statement of Claim, the State:
- (a) denies the allegations;
 - (b) says that Section 3.2 of the Flood Procedures Manual relevantly provided that the rainfall scenarios referred to are 'cases [that] can be used as a guide'.
96. As to paragraph 107 of the Statement of Claim, the State:
- (a) says that the Flood Mitigation Manual relevantly provided in Section 8.4 as set out in response to paragraph 106 of the Statement of Claim above;
 - (b) otherwise denies the allegations.
97. As to paragraph 108 of the Statement of Claim, the State:
- (a) says that the Flood Mitigation Manual relevantly provided in Section 8.1 as set out in response to paragraph 106 of the Statement of Claim above;
 - (b) otherwise denies the allegations.

Strategy W1

98. As to paragraphs 109 and 110 of the Statement of Claim, the State:
- (a) says that the Flood Mitigation Manual relevantly provided:

Strategy W1 – The Primary Consideration is Minimising Disruption to Downstream Rural

Conditions	
	<ul style="list-style-type: none"> * <i>Wivenhoe Storage Level predicted to be less than 68.50 m AHD</i> * <i>Maximum release predicted to be less than 1,900 m³/s</i> * <i>The primary consideration is minimising disruption to downstream rural life</i>

The intent of Strategy W1 is to not to submerge the bridges downstream of the dam prematurely (see Appendix I). The limiting condition for Strategy W1 is the submergence of Mt Crosby Weir Bridge that occurs at approximately 1,900 m³/s.

...
For situations where flood rains are occurring on the catchment upstream of Wivenhoe Dam and only minor rainfall is occurring downstream of the dam, releases are to be regulated to limit, as much as appropriate in the circumstances, downstream flooding.

The following strategies require a great deal of control over releases and knowledge of discharges from Lockyer Creek. In general, the releases from Wivenhoe Dam are controlled such that the combined flow from Lockyer Creek and Wivenhoe Dam is less than the limiting values to delay the submergence of particular bridges. The diagram above shows the location of the impacted bridges and the approximate river flow rate at which they are closed to traffic.

Strategy W1A Twin Bridges, Savages Crossing and Colleges Crossing

**Lake Level greater than 67.25 m AHD
[Maximum Release 110 m³/s]**

Firstly, endeavour to maintain Twin Bridges trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 50 m³/s.

Once Twin Bridges is closed to traffic, endeavour to maintain Savages Crossing trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 110 m³/s.

Once Savages Crossing is closed to traffic, endeavour to maintain College's Crossing trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 175 m³/s. Note that College's Crossing can be impacted by tidal influences.

When the flood event subsides, all gates are to be closed when the dam achieves FSL in accordance with Section 8.5.

Strategy W1B College's Crossing and Burtons Bridge

**Lake Level greater than 67.50 m AHD
[Maximum Release 380 m³/s]**

No consideration is given to maintaining Twin Bridges or Savages Crossing open.

Endeavour to maintain College's Crossing trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 175 m³/s.

Once College's Crossing is closed to traffic, endeavour to maintain Burtons Bridge trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 430 m³/s.

Strategy W1C *Burtons Bridge and Kholo Bridge*

***Lake Level greater than 67.75 m AHD
[Maximum Release 500 m³/s]***

No consideration is given to maintaining College's Crossing open.

Endeavour to maintain Burtons Bridge trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 430 m³/s.

Once Burtons Bridge is closed to traffic, endeavour to maintain Kholo Bridge trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 550 m³/s.

**Strategy W1D *Kholo Bridge and Mt Crosby Weir Bridge*
Lake Level greater than 68.00 m ADH**

[Maximum Release 1900 m³/s]

No consideration is given to maintaining Burtons Bridge open.

Endeavour to maintain Kholo Bridge trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 550 m³/s.

Once Kholo Bridge is closed to traffic, endeavour to maintain Mt Crosby Weir Bridge trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 1900 m³/s.

Strategy W1E *Mt Crosby Weir Bridge and Fernvale Bridge*

***Lake Level greater than 68.25 m AHD
[Maximum Release 1900 m³/s]***

No consideration is given to maintaining Kholo Bridge open.

Endeavour to maintain Mt Crosby Weir Bridge trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 1900 m³/s.

Once Mt Crosby Weir Bridge is closed to traffic, endeavour to maintain Fernvale Bridge trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 2000 m³/s.

If the level reaches EL 68.5 m AHD in Wivenhoe Dam, switch to Strategy W2 or W3 as appropriate.

- (b) otherwise denies the allegations.

Strategy W2

99. As to paragraphs 111 to 113 of the Statement of Claim, the State:

- (a) says that the Flood Mitigation Manual relevantly provided:

Strategy W2 - Strategy W2 is a Transition Strategy where the primary consideration changes from Minimising Impact to Downstream Rural Life to Protecting Urban Areas from Inundation.

Conditions	<ul style="list-style-type: none"> ▪ <i>Wivenhoe Storage Level predicted to be between 68.50 and 74.00 m AHD</i> ▪ <i>Maximum Release predicted to be less than 3,500 m³/s</i> ▪ <i>This is a transition strategy in which the primary consideration changes from minimising disruption to downstream rural life to protecting urban areas from inundation</i> ▪ <i>Lower level objectives are still considered when making decisions on water releases. Objectives are always considered in order of importance</i>
-------------------	---

The intent of Strategy W2 is limit the flow in the Brisbane River to less than the naturally occurring peaks at Lowood and Moggill, while remaining within the upper limit of non-damaging floods at Lowood (3,500 m³/s). In these instances, the combined peak river flows should not exceed those shown in the following table:

LOCATION	TARGET MAXIMUM FLOW IN THE BRISBANE RIVER
Lowood	The lesser of: <ul style="list-style-type: none"> ▪ <i>the natural peak flow at Lowood excluding Wivenhoe Dam releases, and;</i> ▪ <i>3,500m³/s.</i>
Moggill	The lesser of: <ul style="list-style-type: none"> ▪ <i>the natural peak flow at Moggill excluding Wivenhoe Dam releases, and;</i> ▪ <i>4,000m³/s.</i>

(b) otherwise denies the allegations.

Strategy W3

100. As to paragraphs 114 to 115 of the Statement of Claim, the State:

(a) says that the Flood Mitigation Manual relevantly provided:

Strategy W3 - The primary consideration is Protecting Urban Areas from Inundation

Conditions	<ul style="list-style-type: none"> ▪ <i>Wivenhoe Storage Level predicted to be between 68.50 and 74.00 m AHD</i> ▪ <i>Maximum Release should not exceed 4,000 m³/s</i> ▪ <i>The primary consideration is protecting urban areas from inundation</i> ▪ <i>Lower level objectives are still considered when making decisions on water releases. Objectives are always considered in order of importance</i>
-------------------	--

The intent of Strategy W3 is to limit the flow in the Brisbane River at Moggill to less than 4000 m³/s, noting that 4000 m³/s at Moggill is the upper limit of non-damaging floods downstream. The combined peak river flow targets for Strategy W3 are shown in the following table. In relation to these targets, it should be noted that depending on natural flows from the Lockyer and Bremer catchments, it may not be possible to limit the flow at Moggill to below 4000 m³/s. In these instances, the flow at Moggill is to be kept as low as possible.

TIMING	TARGET-MAXIMUM FLOW IN THE BRISBANE RIVER
<i>Prior to the naturally occurring peak at Moggill (excluding Wivenhoe Dam releases).</i>	<i>The flow at Moggill is to be minimised.</i>
<i>After the naturally occurring peak at Moggill (excluding Wivenhoe Dam releases).</i>	<i>The flow at Moggill is to be lowered to 4,000m³/s as soon as possible.</i>

(b) otherwise denies the allegations.

Strategy W4

101. As to paragraphs 116 and 117 of the Statement of Claim, the State:

(a) says that the Flood Mitigation Manual relevantly provided:

Strategy W4 - Primary Consideration is Protecting the Structural Safety of the Dam	
Conditions	<ul style="list-style-type: none"> • Wivenhoe Storage Level predicted to exceed 74.00m AHD • No limit on Maximum Release rate • The primary consideration is protecting the structural safety of the dam • Lower level objectives are still considered when making decisions on water releases. Objectives are always considered in order of importance

The intent of Strategy W4 is to ensure the safety of the dam while limiting downstream impacts as much as possible.

This strategy normally comes into effect when the water level in Wivenhoe Dam reaches 74.0 m AHD. However the Senior Flood Operations Engineer may seek to invoke the discretionary powers of Section 2.8 if earlier commencement is able to prevent triggering of a fuse plug.

Under Strategy W4 the release rate is increased as the safety of the dam becomes the priority. Opening of the gates is to occur generally in

accordance with the requirements of Section 8.6, until the storage level of Wivenhoe Dam begins to fall.

There are no restrictions on gate opening increments or gate operating frequency once the storage level exceeds 74.0 AHD, as the safety of the dam is of primary concern at these storage levels. However, the impact of rapidly increasing discharge from Wivenhoe Dam on downstream reaches should be considered when determining gate opening sequences.

Strategy W4A - No Fuse Plug Initiation Expected

Lake Level between **74.0** and **75.5 m AHD**
[No Maximum Release]

Strategy 4A applies while all indications of the peak flood level in Wivenhoe Dam are that it will be insufficient to trigger operation of the first bay of the fuse plug by reaching 75.5 m AHD.

Gate openings are generally to occur at the minimum intervals and sequences as specified in Section 8.6 until the storage level of Wivenhoe Dam begins to fall. However, to protect the safety of the dam, minimum opening intervals can be reduced and gate opening sequences can be modified.

Strategy W4B - Fuse Plug Initiation Possible

Lake Level greater than **75.5 m AHD**
[No Maximum Release]

Strategy W4B applies once indications are the peak flood level in Wivenhoe Dam may exceed EL75.5 and trigger the fuse plug under normal operations. Two scenarios are possible under this strategy. The first scenario is where it may be possible to prevent fuse plug initiation by early opening of the gates. The second scenario is where fuse plug initiation cannot be avoided. The actions associated with these scenarios are contained in the following table:

SCENARIO	ACTION
<p>Potential to keep lake level below EL 75.5 by early opening of the gates and/or varying the operational procedures at Somerset.</p>	<p>The following actions can be used to prevent initiation of the fuse plug provided the safety of the dams is not compromised:</p> <ul style="list-style-type: none"> ▪ Retain water in Somerset Dam (See Somerset Dam Strategy S3 for guidelines). ▪ Bring the gate operation sequence forward to increase discharge from the dam. <p>In addition to dam safety issues, the impact of rapidly increasing discharge from Wivenhoe Dam on downstream reaches should be considered when determining the rate of gate openings.</p>

<p><i>Fuse plug initiation cannot be avoided.</i></p>	<p><u>PRIOR TO FUSE PLUG INITIATION</u></p> <p><i>If possible, the gates are to be raised at a rate to ensure they are out of the water before the initiation of the first fuse plug. The gates should be in the fully open position before the dam water level reaches 75.7 m AHD.</i></p> <p><u>FOLLOWING FUSE PLUG INITIATION</u></p> <p><i>The impact of rapidly changing discharge from Wivenhoe Dam on downstream reaches should be considered when determining the rate of gate closings in these circumstances. However, once a fuse plug is initiated, the flood storage at the dam is to be drained as quickly as possible within the gate closure sequence.</i></p>
---	--

- (b) otherwise denies the allegations.

Gate closing strategies

102. As to paragraph 118 of the Statement of Claim, the State:

- (a) says that the Flood Mitigation Manual relevantly provided:

8.5 Gate Closing Strategies

In general, gate closing commences when the level in Wivenhoe Dam begins to fall and is generally to occur in the reverse order to opening. The final gate closure should occur when the lake level has returned to Full Supply Level. The following requirements must be considered when determining gate closure sequences:

- *Where possible, total releases during closure should not produce greater flood levels downstream than occurred during the flood event.*
- *The maximum discharge from the dam during closure should generally be less than the peak inflow into Wivenhoe Dam experienced during the event. The discharge from Wivenhoe Dam includes discharge from triggered fuse plugs, gates, regulator cone dispersion valve and hydro release.*
- *If, at the time the lake level in Wivenhoe Dam begins to fall, the combined flow at Lowood is in excess of 3,500 m³/s then the combined flow at Lowood is to be reduced to 3,500 m³/s as quickly as practicable.*
- *The aim should always be to empty stored floodwaters stored above EL 67.0m within seven days after the flood peak has passed through the dams. However, provided a favourable weather outlook is available, this requirement can be relaxed for the volume between*

EL 67.0m and EL 67.5m, to obtain positive environmental outcomes.

- *If the flood storage compartments of Wivenhoe Dam and Somerset Dam can be emptied within seven days, the maximum flow in the Brisbane River at Lowood should not exceed 3,500 m³/s.*
- *To minimise the stranding of fish downstream of the dam, final closure sequences should*

There may be a need to take into account base flow when determining final gate closure. This may mean that the lake level temporarily falls below Full Supply Level to provide for a full dam at the end of the Flood Event.

- (b) otherwise denies the allegations.

Somerset Dam Flood Operations Strategies

103. As to paragraph 119 of the Statement of Claim, the State:

- (a) says that the Flood Mitigation Manual relevantly provided in Section 8.4 as set out in response to paragraph 87 of the Statement of Claim above;
- (b) says that the Flood Mitigation Manual relevantly provided in Section 9.1:

... Somerset and Wivenhoe Dam are to be operated in conjunction to optimise the flood mitigation benefits downstream of Wivenhoe ...

- (c) otherwise denies the allegations.

104. The State admits paragraph 120 of the Statement of Claim.

105. As to paragraphs 121 to 123 of the Statement of Claim, the State:

- (a) says that the Flood Mitigation Manual relevantly provided in Section 9.3:

9.3 Flood Operations Strategies *There are three strategies used when operating Somerset Dam during a flood event as outlined below. These strategies are based on the Flood Objectives of this manual. The strategy chosen at any point in time will depend on predictions of the maximum storage levels in Wivenhoe and Somerset Dams which are to be made using the best forecast rainfall and stream flow information available at the time.*

Strategies are likely to change during a flood event as forecasts change and rain is received in the catchments. It is not possible to predict the range of strategies that will be used during the course of a flood event at the commencement of the event. Strategies are changed in response to changing rainfall forecasts and stream flow conditions to maximise the flood mitigation benefits of the dams.

When calculating the impacts of flood releases from Somerset Dam, the gate opening sequences outlined in Section 9.5 should be used to determine likely outflow rates from the dam.

A flow chart showing how best to select the appropriate strategy to use at any point in time is shown below:

...

[flowchart not inserted but will be referred to and relied upon at the trial]

- (b) otherwise denies the allegations.

Strategy S1

106. As to paragraphs 124 to 126 of the Statement of Claim, the State:

- (a) says that the Flood Mitigation Manual relevantly provided:

Strategy S1 – Minimising Impact on Rural Life Upstream

Conditions	<ul style="list-style-type: none"> • Somerset Dam Level expected to exceed EL 99.0 and Wivenhoe Dam not expected to reach EL 67.0 (FSL) during the course of the Flood Event.
-------------------	--

The intent of this strategy is to return the dam to full supply level while minimising the impact on rural life upstream of the dam. Consideration is also given to minimising the downstream environmental impacts from the release.

The crest gates at Somerset Dam are raised to enable uncontrolled discharge. The Regulator Valves and Sluice gates are to be used to maintain the level in Somerset dam below EL 102.0 (deck level of Mary Smokes Bridge). The release rate from Somerset dam is not to exceed the peak inflow into the dam.

- (b) otherwise denies the allegations.

Strategy S2

107. As to paragraphs 127 to 129 of the Statement of Claim, the State:

- (a) says that the Flood Mitigation Manual relevantly provided:

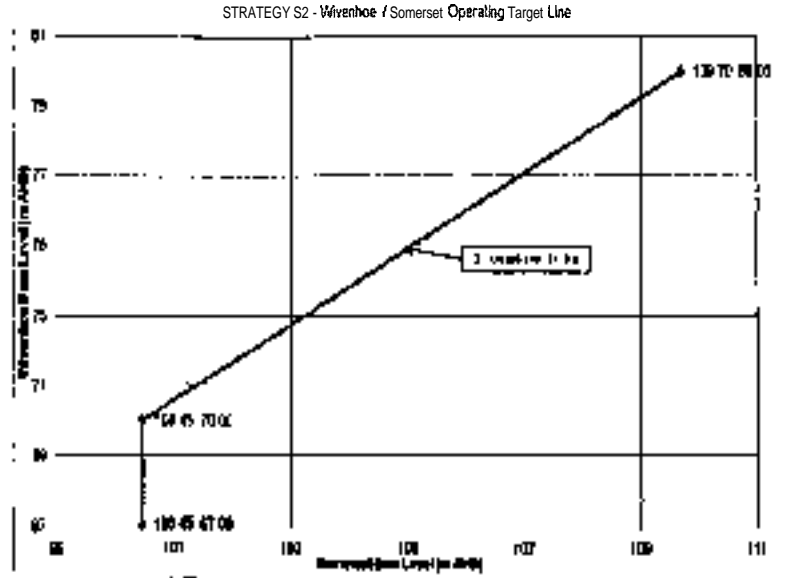
Strategy S2 – Minimise Impacts below Wivenhoe Dam

Conditions	<ul style="list-style-type: none"> • Somerset Dam Level expected to exceed EL 99.0 and Wivenhoe Dam level expected to exceed EL 67.0 (FSL) but not exceed EL 75.5 (fuse plug initiation) during the course of the Flood Event.
-------------------	---

The intent of this strategy is to maximise the benefits of the flood storage capabilities of the dam while protecting the structural safety

of both dams. The table below contains the operating conditions and actions for Strategy S2.

CONDITION	ACTION
<i>Wivenhoe rising and Somerset level below EL 100.45.</i>	<i>The crest gates are raised to enable uncontrolled discharge. The low level regulators and sluices are generally kept closed.</i>
<i>Wivenhoe rising and Somerset level above EL 100.45.</i>	<i>The crest gates are raised to enable uncontrolled discharge. Operations are to target a correlation of water levels in Somerset Dam and Wivenhoe Dam as set out in the graph below. The operations target line shown on this graph is to generally be followed as the flood event progresses. The release rate from Somerset Dam is generally not to exceed the peak inflow into the dam.</i>
<i>Wivenhoe falling and Somerset level above EL 100.45.</i>	<i>The opening of the regulators and sluices generally should not cause Wivenhoe Dam to rise significantly. The release rate from Somerset Dam is generally not to exceed the peak inflow into the dam.</i>
<i>The Flood Event has emanated mainly from the Stanley River catchment without significant runoff in the Upper Brisbane River catchment</i>	<i>The crest gates at Somerset Dam are raised to enable uncontrolled discharge. The Regulator Valves and Sluice gates are to be used to maintain the level in Somerset dam below EL 102.0 (deck level of Mary Smokes Bridge). The release rate from Somerset Dam is generally not to exceed the peak inflow into the dam.</i>



Notes:

- *The Operating Target Line was selected following an optimisation study. The Target Line was selected based on the following factors:*
 - o *Equal minimisation of flood level peaks in both dams in relation to their associated dam failure levels.*
 - o *Minimisation of flows in the Brisbane River downstream of Wivenhoe Dam.*
 - o *Consideration of the time needed at the onset of a Flood Event to properly assess the magnitude of the event and the likely impacts, so that the likely optimal strategy to maximise the Flood Mitigation benefits of the storages can be selected.*
- *The levels of 109.70 m AHD and 80.00 m AHD represent the likely failure level for Somerset Dam and the level at the top of the Wivenhoe Dam Wave Wall respectively. Note that the failure level of 109.70 m AHD for Somerset Dam assumes all radial gates are fully open and this failure level will be reduced if this cannot be achieved.*
- *The target point on the operating target line at any point in time is based on the maximum storage levels in Wivenhoe and Somerset Dams using the best forecast rainfall and stream flow information available at the time.*
- *Gate operations will enable the movement of the duty point towards the target line in a progressive manner. It will not necessarily be possible to adjust the duty point directly towards the target line in a single gate operation.*

(b) otherwise denies the allegations.

Strategy S3

108. As to paragraphs 130 to 131A of the Statement of Claim, the State:

(a) says that the Flood Mitigation Manual relevantly provided:

Strategy S3 - Protect the Structural Safety of the Dam

Conditions	<ul style="list-style-type: none"> ▪ Somerset Dam Level expected to exceed EL 99.0 and Wivenhoe Dam level expected to exceed EL 75.5 (fuse plug initiation) during the course of the Flood Event.
-------------------	---

The intent of this strategy is to maximise the benefits of the flood storage capabilities of the dam while protecting the structural safety of both dams.

In addition to the operating protocols used in Strategy S2, to prevent fuse plug initiation, consideration can be given to temporary departure from the operating protocols contained in this strategy under the following conditions:

- *The safety of Somerset Dam is the primary consideration and cannot be compromised.*
- *The peak level in Somerset dam cannot exceed EL 109.7.*

(b) otherwise denies the allegations.

Gate Closing Strategies

109. As to paragraph 132 of the Statement of Claim, the State:

(a) says that the Flood Mitigation Manual relevantly provided:

9.4 Gate Closing Strategies

In general, gate closing commences when the level in Somerset Dam begins to fall and is generally to occur in the reverse order to opening. The final gate closure should occur when the lake level has returned to Full Supply Level. The following requirements must be considered when determining gate closure sequences:

- *Unless determined otherwise by the Senior Flood Operations Engineer in accordance with Section 2.8, the aim should be to empty stored floodwaters within seven days after the flood peak has passed through the dams.*
- *To minimise the stranding of fish downstream of the dam, final closure sequences should consider Seqwater policies relating to fish protection at the dam.*

There may be a need to take into account base flow when determining final gate closure. This may mean that the lake level temporarily falls below Full Supply Level to provide for a full dam at the end of the Flood Event.

(b) otherwise denies the allegations.

The Real Time Flood Model

110. As to paragraphs 133, 134, 135, 136 and 136A of the Statement of Claim, the State:

- (a) admits that a real time flood monitoring and forecasting system known as the "Real Time Flood Model" (**RTFM**) was used by the Flood Engineers during December 2010 and January 2011;
- (b) says that the RTFM comprised two integrated modules known respectively as "FLOOD-Col" and "FLOOD-Ops";
- (c) says that FLOOD-Col was the module used continuously to collect real time data from gauges in the sub-catchments above and below Somerset Dam and Wivenhoe Dam;
- (d) says that real time data was transmitted by radio telemetry from gauges to the Flood Operations Centre;
- (e) says that FLOOD-Ops was the module comprising modelling software:
 - (i) used to analyse and calibrate the real time data received by FLOOD-Col;
 - (ii) used to predict runoff and generate hydrographs of runoff;
 - (iii) into which further information including rainfall forecast information could be input to derive inflow hydrographs;
- (f) says that Operations Spreadsheets were produced from the output of FLOOD-Ops for the purpose of, *inter alia*, determining gate operations strategies for Wivenhoe Dam and Somerset Dam in accordance with the Flood Mitigation Manual;
- (g) says that the flood behaviour of the Brisbane River catchment is complex because:
 - (i) there are several major waterways within the basin with each tributary possessing individual catchment characteristics, runoff response from rainfall, and routing behaviour which influences the timing and hydrograph shape of floods moving down the waterways;
 - (ii) rain does not fall evenly across the catchments, and rainfall patterns are not predictable on a catchment scale;
- (h) says that the RTFM provided the Flood Engineers with a modelling tool which was calibrated for sub-catchments, but whose utility depended upon professional judgement being applied at several points in the modelling process;
- (i) says that the Flood Engineers were required to exercise professional judgement in, *inter alia*:

- (i) continually assessing the reliability of real time data received by FLOOD-Col and filtering data determined to be unreliable;
 - (ii) spatially and temporally estimating and distributing observed and forecast rainfall within the catchments above and below Wivenhoe Dam and Somerset Dam;
 - (iii) monitoring and adjusting processes within the RTFM to match model results and hydrographs with real time data;
 - (iv) routing catchment runoff to estimate the shape, timing and magnitude of flood peaks;
 - (v) evaluating flow data and outputs from FLOOD-Ops in predicting inflows to Wivenhoe Dam and Somerset Dam and inflows to the Brisbane River from tributaries below those dams;
 - (vi) evaluating the outputs from FLOOD-Ops to produce Operations Spreadsheets;
 - (vii) analysing predicted inflows to determine gate operational strategies;
 - (viii) assessing outputs from FLOOD-Ops against Operations Spreadsheets to determine when Operations Spreadsheets are out of date as a result of further rainfall events within the catchments;
- (j) otherwise denies the allegations.

111. As to paragraph 136B of the Statement of Claim, the State:

- (a) admits that, in modelling hydrographs of projected inflows into Somerset Dam and Wivenhoe Dam using the RTFM, it was necessary for the flood engineers to specify initial and continuing loss rates for locations within the catchments;
- (b) says that the selection of loss rates reflects the exercise of judgements by the Flood Engineers to adjust the output from the RTFM:
 - (i) to account for antecedent wetness within the catchments;
 - (ii) to account for variations in temporal and spatial distribution and intensity of rainfall within the catchments;
 - (iii) to compensate for inaccurate or inadequate data;
 - (iv) to ensure an accurate correlation between the calculated hydrograph and the recorded hydrograph;
- (c) otherwise denies the allegations.

112. As to paragraphs 137 and 138 of the Statement of Claim, the State:

- (a) admits the allegations in sub-paragraphs 137(a), (b), (e) and (f);
- (b) says that QPFs were issued at 10:00 and 16:00 and forecast catchment average rainfall for the Lake Somerset and Lake Wivenhoe catchment for the 24 hour period from the time of issue;
- (c) says multi-day rainfall Poor Man's Ensemble maps (**PME**) 1, 4 and 8 day forecasts and flood model results were published twice each day by the BoM on the internet;
- (d) says that the Statement of Claim refers to daily PMEs without identifying which of the daily PMEs published for that particular day are referred to;
- (e) in so far as this Defence refers to PME 1, 4 and 8 day forecasts in response to allegations contained in the Statement of Claim, the Defence refers to the PME forecasts identified by the Plaintiff's expert, Dr Christensen in Figure 39 in Volume 2 of his Report dated 19 February 2015 referred to in the Statement of Claim;
- (f) says that BoM also published information and maps predicting rain at or above specified quantities expressed as a percentage for daily forecasts 1 to 5 days;
- (g) says that the Flood Engineers had subscriber access through the internet to ACCESS R SILO 72 hour forecast information;
- (h) otherwise denies the allegations in sub-paragraphs 137(c) and (d) and paragraph 138.

113. As to paragraphs 139, 139A, 140, 141 and 142 of the Statement of Claim, the State:

- (a) repeats and relies upon the matters pleaded in response to paragraphs 137 and 138 of the Statement of Claim above;
- (b) admits the allegations contained in paragraph 142;
- (c) says that the process of inputting rainfall forecast information into the RTFM required the Flood Engineers to exercise professional judgement in spatially and temporally estimating and distributing observed and forecast rainfall within the catchments above and below Wivenhoe Dam and Somerset Dam;
- (d) admits that once forecast information was input into the RTFM, the model could provide a prediction as to inflows to Wivenhoe Dam and Somerset Dam and inflows to the Brisbane River from tributaries below those dams;

- (e) says that:
 - (i) the BoM short to medium term (0-48 hr) forecasts of rainfall had demonstrated considerable error in the prediction of the location, amount and timing of rainfall events at the scale of the Wivenhoe Dam and Somerset Dam catchments;
 - (ii) the BoM longer term forecasts (4-day and 8-day) were less reliable;
- (f) says that BoM forecast models cannot be relied on to capture the development of rainfall events at extended (4-day and 8-day) timescales;
- (g) says that BoM forecast models have less accuracy at the catchment scale relevant to dam operations for higher rainfall intensities;
- (h) says that BoM 8 day rainfall forecast may provide some indication of the flood-producing potential of systems but models cannot be relied upon to capture the development of rainfall events at that timescale;
- (i) says that by reason of the matters pleaded in sub-paragraphs (e) to (h) above, it was difficult to predict the actual location, timing and intensity of rain within the Brisbane River Basin, where operation of Wivenhoe Dam and Somerset Dam requires consideration of both upstream and downstream rainfall and inflows;
- (j) says that dam operational decisions based on uncertain rainfall forecast information may produce worse outcomes than decisions based on actual rainfall observations;
- (k) says that BoM had qualified reliance upon forecasts in making dam operational decisions;

Particulars

Document entitled "Rainfall Forecasting for the Wivenhoe Dam Catchment" dated 24 July 2006 attached to an email from Peter Baddiley and Rob Drury dated 1 December 2010.

- (l) subject to the matters pleaded in sub-paragraphs (c) to (k) above, admits sub-paragraphs 141(c) and (d) of the Statement of Claim;
- (m) otherwise denies the allegations.

Duties of Care

Risk of Harm

114. As to paragraphs 142A and 142B of the Statement of Claim, the State:

- (a) admits that there existed a risk of harm if there was a failure properly to conduct flood operations at Somerset Dam and Wivenhoe Dam;
- (b) denies that the risk of harm was that pleaded in paragraph 142A of the Statement of Claim;
- (c) says that, between 9 and 11 January 2011, part of the Extreme Rainfall Event pleaded in paragraph 261 below occurred over Wivenhoe Dam, Somerset Dam and their catchments which resulted in the level of water in Wivenhoe Dam rising above EL 74 and necessitated releases of water from Wivenhoe Dam under Strategy W4;
- (d) in relation to claims alleged against Mr Ruffini, says that properly characterised, the risk of harm was whether, by not departing from the general strategy for management of the Flood Event determined by the Senior Flood operations Engineer when he was on duty in the Flood Operations Centre in January 2011, there was a risk that an extreme rainfall event of the kind which occurred between 9 and 11 January 2011 might occur such as would necessitate the releases of water from Wivenhoe Dam which were made, resulting in greater inundation to property downstream of Wivenhoe Dam;
- (e) otherwise denies the allegations.

115. As to paragraphs 143 to 146 of the Statement of Claim, the State:

- (a) says that the Extreme Rainfall Event was not reasonably foreseeable prior to approximately 11:00 on 9 January 2011;
- (b) says further that
- (c) as at 11:00 on 9 January 2011 the full magnitude of the rainfall that subsequently occurred on 10 and 11 January 2011 was not reasonably foreseeable;
- (d) says further that the plaintiff has not identified the 'Group Members';
- (e) otherwise does not admit paragraphs 143 to 146 because those paragraphs make no allegation against the State.

116. As to paragraphs 147 to 148 of the Statement of Claim, the State:

- (a) repeats and relies on sub-paragraphs (a) and (b) of the preceding paragraph of the Defence;
- (b) otherwise does not admit paragraphs 147 to 148 because those paragraphs make no allegation against the State.

117. As to paragraphs 149 and 150 of the Statement of Claim, the State:

- (a) denies the allegations in sub-paragraph 149(a);
- (b) says that the conduct of flood operations at Somerset Dam and Wivenhoe Dam could be inherently dangerous and extremely hazardous depending upon the size, nature and extent of the flood event;
- (c) says that the purpose of flood operations by the Flood Engineers included mitigating the danger created by flood events;
- (d) says that the Flood Engineers did not owe the Group Members or the Plaintiff a duty to take reasonable care in the operation of the Dams as alleged because:
 - (i) the Flood Engineers and the First and Second Defendant, in undertaking flood mitigation, were exercising independent functions of a public or other authority;
 - (ii) the Flood Engineers did not do an act or make an omission that was, in the circumstances and for the purposes of s 36 of the *Civil Liability Act 2003* (Qld), so unreasonable that no public or other authority, having such functions, could consider the Flood Engineers to have acted other than reasonably;
 - (iii) the operation of the dams involved a balance of considerations of which flood mitigation was one, but which also included:
 - (1) the safety of Wivenhoe and Somerset Dams;
 - (2) preservation of water below FSL for drinking water, domestic and industry supply;
 - (3) making such releases as required to maintain a minimum flow downstream from the Dams;
 - (iv) the considerations referred in the preceding sub-paragraph (iii) were prescribed by the *Water Supply Act* and the Flood Mitigation Manual (made and approved pursuant to that Act);
 - (v) the balancing of those considerations:
 - (1) was not a function or responsibility of the Flood Engineers;
 - (2) was reflected in the terms of the Flood Mitigation Manual, including the strategies it contained and the circumstances in which it required the selection of one or other of such strategies;

- (vi) such criteria are not ones that offer standards by reference to which the reasonableness of the Flood Engineers' acts or omissions might be determined by a Court.

Events 1 December 2010 to 16 December 2010

118. As to paragraph 151 of the Statement of Claim, the State:

- (a) says that rainfall between 1 December 2010 and 15 December 2010 was of low intensity and scattered throughout the Wivenhoe and Somerset catchments;
- (b) otherwise denies the allegations.

119. The State admits paragraph 152 of the Statement of Claim.

120. The State admits paragraph 153 of the Statement of Claim.

121. The State admits paragraph 154 of the Statement of Claim.

122. As to paragraph 155 of the Statement of Claim, the State:

- (a) says that:
 - (i) releases of approximately 50m³/s were made from Wivenhoe Dam in the period from 1 December 2010 until approximately 12:30 on 13 December 2010 through the regulator and hydro;
 - (ii) at about 12:30 on 13 December 2010 the regulator was closed;
 - (iii) from about 13:00 to 15:30 on 13 December 2010 Gate 3 was opened progressively to 3.0 m;
 - (iv) from about 15:30 on 13 December 2010 for the remainder of that day, releases from Gate 3 were approximately 290 m³/s with the hydro continuing to release approximately 13 m³/s resulting in total releases being just over 300 m³/s;
 - (v) on 2 December 2010, 3 December 2010, 4 December 2010 and continuously from 6 December 2010 until approximately midday on 13 December 2010 releases at Somerset Dam were made through a regulator;
 - (vi) at about midday on 13 December 2010 for the remainder of that day, two regulators were opened to release approximately 138 m³/s at Somerset Dam;
- (b) otherwise denies the allegations.

123. As to paragraph 156 of the Statement of Claim, the State:

- (a) says that:
 - (i) because Wivenhoe Dam was nearing FSL, by Wivenhoe Directive 2, releases from Gate 3 were progressively closed from 08:00 on 16 December 2010;
 - (ii) after closure of Gate 3 releases then continued through the hydro at the rate of approximately 13 m³/s;
 - (iii) from approximately 13:00, immediately after fish recovery operations, until 18:00 on 17 December 2010 releases continued from Wivenhoe Dam at the rate of approximately 50 m³/s through the regulator and hydro;
 - (iv) at Somerset Dam, releases continued through two regulators until the afternoon of 16 December 2010, when one of the regulators was closed and thereafter releases continued through one regulator at the rate of approximately 69 m³/s;
- (b) says that at no time on 16 December 2010 did the water reach the trigger level for the opening of gates at either Wivenhoe or Somerset Dams under the Flood Mitigation Manual;
- (c) otherwise denies the allegations.

124. As to paragraph 157 of the Statement of Claim, the State:

- (a) admits that, from around 10:30 on 16 December 2010, no Flood Engineer was rostered on duty at the Flood Operations Centre to carry out dam operations at Wivenhoe and Somerset Dams;
- (b) says that at all material times after 10:30 on 16 December 2010:
 - (i) the Flood Operations Centre remained mobilised with a Flood Engineer on duty carrying out dam operations at North Pine Dam and also monitoring rainfall in the region;
 - (ii) a Flood Engineer was rostered on call monitoring the Wivenhoe and Somerset catchments and levels in those Dams;
 - (iii) releases at Wivenhoe Dam and Somerset Dam continued in the manner pleaded in response to paragraph 156 of the Statement of Claim above;
 - (iv) immediately it became apparent that the continued releases through the regulators could not be reasonably expected to bring each of Lake

Wivenhoe and Lake Somerset down to FSL within seven days, the Flood Operations Centre was mobilised from 07:00 on 17 December 2010 for dam operations at Wivenhoe Dam and Somerset Dam;

(c) otherwise denies the allegations.

125. As to paragraph 158 of the Statement of Claim, the State:

(a) repeats its responses to paragraphs 155 to 157 of the Statement of Claim above;

(b) says that:

(i) the Dam Level email received by the Flood Engineer on duty at approximately 10:04 advised that the level of Lake Wivenhoe was EL 67.10 at 10:00 on 16 December 2010;

(ii) the level of Lake Wivenhoe was in fact EL 67.07;

(c) otherwise admits the allegations in sub-paragraphs 158 (b), (e) and (f);

(d) as to sub-paragraphs 158(c) and (g):

(i) admits that inflows into both Lake Wivenhoe and Lake Somerset continued;

(ii) does not admit that the inflows were "flood inflows";

(iii) says that:

(1) the inflows comprised in whole or in substantial part base flows, and were ordinarily expected inflows reasonably managed by the regulators;

(2) at approximately 23:00 on 13 December 2010 the Flood Engineer then on duty produced hydrographs modelling inflows using the FLOOD-Ops RTFM and produced Operations Spreadsheets (**SDWD-201012132300**);

(3) SDWD-201012132300 Operations Spreadsheets remained relevant and in use in the Flood Operations Centre until the morning of 16 December 2010;

(4) SDWD-201012132300 predicted that Wivenhoe Dam would return to FSL by approximately 20 December 2010 and that Somerset Dam would return to FSL by approximately 17 December 2010;

(iv) in the premises, as at 16 December 2010 it was reasonably to be expected that releases from regulators would bring both Lake Wivenhoe and Lake

Somerset to FSL within seven days conformably with the Flood Mitigation Manual;

(e) as to sub-paragraph 158(d):

(i) says that:

- (1) the QPF for catchment average rainfall for the 24 hour period from 10:00 on 16 December 2010 to 10:00 on 17 December 2010 was 10 mm to 20 mm with isolated falls to 40 mm;
- (2) the 1 day PME forecast for 16 December 2010 was for continuing rain of between 1 mm to 5 mm;
- (3) inflows resulting from rainfalls of the magnitude forecast by the 1, 4 and 8 day PME forecasts, if they occurred, could be adequately managed by continued releases made through dam regulators and, if necessary, gate operations;

(f) otherwise denies the allegations.

126. As to paragraph 158A of the Statement of Claim, the State:

- (a) says that the Flood Engineers were not authorised to make releases below FSL to create "flood storage capacity";
- (b) denies the allegations.

127. As to paragraph 160 of the Statement of Claim, the State:

- (a) admits the allegations contained in sub-paragraph 160(a);
- (b) repeats and relies upon the matters pleaded in response to paragraphs 158 and 158A of the Statement of Claim above;
- (c) denies that a reasonably prudent flood engineer responsible for Flood Operations at Somerset Dam and Wivenhoe Dam on 16 December 2010 would have acted in the manner alleged in sub-paragraphs 160(b) to (h) inclusive.

128. As to paragraphs 161 and 162 of the Statement of Claim, the State:

- (a) repeats and relies upon its responses to paragraphs 158 to 160 of the Statement of Claim above;
- (b) denies that any of the Flood Engineers breached a duty of care to the plaintiff or other Group Members on 16 December 2010;