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The Honourable Justice Holmes
Queensland Floods Commission of Inquiry

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Your Honour,

**Supplementary Submission regarding
Implementation of systems operations for dams
Response to the 2011 flood, particularly to inform the community**

I am qualified and experienced in corporate governance and risk management, was responsible for its formal implementation in a Federal Statutory Authority, and also have completed formal study of the basics of mechanical engineering and hydrology.

To complete my submission to your Inquiry a week before the original deadline, I asked Seqwater for information about the quantity of water released before the flood. I was refused and told it would not be made public, but would be provided to the Inquiry. I advised the *Courier Mail*, whose report on March 7, "Wivenhoe secrecy as report points to dam", caused interviews with 2 radio and 2 television stations that morning, and resulted in the Premier ordering the public release of the 1180 page detailed flood engineers' report, which enabled many experts to scrutinise it for only the next 4 days, before the 11 March 2011 deadline for submissions.

At 12.30pm on 11 March 2011 the Insurance Council of Australia published on its website the findings of its independent hydrologists, that the cause of the January flooding of Brisbane was the release of water from Wivenhoe Dam.

One explanation for the flood is contained in DERM's *Report on the Operation of Wivenhoe Dam and Summerset Dam*, which in essence says that there were 2 rain events that coincided, to cause double the rainfall of the 1974 event, and that their flood mitigation methods were sufficient to prevent flooding Brisbane prior to the January 2011 'double header' rain event.

As their chart shows, the first huge peak of rain in the afternoon of 10 January flash flooded the Lockyer Creek and caused the Grantham disaster, while the second even bigger peak early on 11 January caused Wivenhoe Dam to rise quickly to 73.7m AHD (Australian Height Datum i.e. above high tide), when the flood gates were opened to avoid blowing the fuse plugs, which would have caused an uncontrollable flood.

Why did the BOM briefing of the Premier and Cabinet in October 2010, when the warning was given that the coming summer would be extraordinarily wet, lead to Seqwater modelling a 25% reduction of the Full Supply Level (the first 100%) but on the basis that this reduction would not be maintained for the whole of summer? If Wivenhoe was at 75% prior to the January 2011 'double header' rain event, the Brisbane flood would have been 40% less than it was – merely a minor flood.

Why did the BOM briefing of the Premier and Cabinet on 5 January when the warning was given of the incoming extreme low pressure system and the monsoon front moving south, not cause Seqwater to accept there were then 2 events coming, that if they combined could flood Brisbane if precautions were not taken. Seqwater's attitude is that they needed more assurance than these events 'could' flood Brisbane, they wanted to know if these events 'would' flood Brisbane.

Seqwater is responsible for managing Wivenhoe for water supply and flood mitigation, but their risk management seems to have given water supply a higher risk profile than flood mitigation – why?

Having listened in the public gallery to the first five days evidence given in Brisbane, I am concerned by the Minister's and the Flood Control Engineers' attempts to conceal the truth from the public, and to deceive your Commission of Inquiry, regarding rainfall forecasts, the capacity of Wivenhoe Dam to limit flooding of Brisbane, and DERM's attempt to shift blame for communications.

1. Disregard of rainfall forecasts

Weather experts have been aware of the La Niña / El Niño weather patterns for many years that operate across the southern Pacific Ocean, and more recently have become aware of similar patterns operating across the northern Pacific Ocean, and the Indian Ocean, that bring periods of above / below average rainfall to the adjacent continents. The Bureau of Meteorology (BOM) was aware that the movement of these 3 weather patterns would coincide to produce particularly very heavy rainfall to the eastern side of Australia last summer, with a strong likelihood of repetition a year later.

Jim Davidson (Queensland CEO of BOM) briefed Cabinet on 18 October 2010 (first time BOM ever briefed Cabinet), and told Cabinet about the strongest La Niña on record, and the need to be particularly vigilant.

Peter Bradley (senior forecaster at BOM) briefed cabinet again on 5 January 2011 - a week before the flood. The second briefing was specifically to warn about the effect of the high-level low-pressure system that was approaching, and the monsoon trough developing to the north.

Recall the evidence that BOM and Seqwater work closely together, that Seqwater Flood Engineer Terry Malone used to work for BOM, that BOM had a copy of the *Manual of Operational Procedures for Flood at Wivenhoe Dam and Somerset Dam (Revision 7, November 2009)*, that BOM was involved in revision of the Flood Control Manual, and that BOM were one of the organisations working closely with the Flood Control Centre whenever there was a flood crisis. Hence I believe BOM would have been very anxious about Seqwater's determination to maintain the Full Supply Level (FSL) despite the approaching exceptionally intense low-pressure system, coupled with the gathering dangerous monsoon slowly descending from the north. (My first submission describes these - taken from the Worley Parsons hydrology report.)

Who wanted BOM's briefings of Cabinet concealed under Parliamentary privilege?

The manual was developed over 40 years with input from many experts independent of Seqwater. The major change introduced by Revision 7 Gazetted in January 2010, was the requirement to utilize the BOM rainfall forecasts when determining when to adopt W4. If that were not the case, then the manual would not have included this requirement, as the BOM forecasts were previously available for the Flood Control Engineers to disregard if they wished. This revision was the combined wisdom of many, not just the brain-child of John Tibaldi, as he would have the Inquiry believe that the revision was merely his intention to expand the details of the procedures to be followed.

Seqwater have disingenuously cited variations between forecast and actual rainfall as justification for ignoring BOM rainfall forecasts, well knowing that rainfall forecasts can never be precise as mankind does not precisely understand why weather or climate changes. The Flood Control Engineers have cited their sloppy November 2009 amendments, which were not made consistently throughout the manual, as justification for ignoring Section 8.4 of the Manual which is quite clear on when to adopt strategy W4:

*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**....(my embolding)*

The emboldened words deserve close attention:

at any point in time does not allow the engineers to consider what strategy to adopt in the future, but rather mandates the strategy to be followed at every present instant, while **and...best forecast rainfall** mandates use of forecast dam level increase to be added to the actual dam level when determining whether to adopt strategy W4, otherwise Section 8.4 would have merely required adoption of W4 when the actual level reached 74mAHD.

During the 5 days hearing in Brisbane the evidence presented did not include the history since about 25 years ago of concern that major earth dams around the world needed safety measures added to prevent the walls being over-topped, which resulted in sacrificial fuse plugs replacing 165m of the Wivenhoe Dam wall – see below **Deception regarding capacity of Wivenhoe Dam to limit flooding of Brisbane.**

Just as the sacrificial fuse plugs were an additional safety measure in 2006, to ensure the lake could not reach the height of the dam wall, so too was the requirement to implement W4 when the lake rose to 1.7m below the lowest fuse plug, as required prior to Revision 7. I submit that the Revision 7 requirement for the Flood Control Engineers to include the forecast rain, was an additional safety measure which reduced the actual level when W4 must be implemented. Rather than merely reduce the W4 trigger level, the intention was to provide the BOM some input to determine when W4 must be implemented, and that input would depend upon variable rainfall forecasts.

The Flood Control Engineers all promised to tell the truth the whole truth and nothing but the truth, and so I am concerned that John Tibaldi said there were 3 circumstances when he would give weight to BOM's rainfall forecasts;

1. **rainfall prediction was very large, for example, caused by a slow moving rainfall system**
2. there were advances in BOM's forecasting accuracy
3. to mobilise the Flood Control Centre

yet all 4 Flood Control Engineers ignored BOM's warnings of the slow moving, huge rainfall producing, monsoon front, until it was too late. Their arrogant belief in their superior understanding of weather events has caused thousands to suffer repairable damage, hundreds to suffer irreparable harm, most of those whose properties were inundated to suffer substantial loss of property value, one to drown, and a number to suicide because of despair at their financial ruin.

2. **Deception regarding capacity of Wivenhoe Dam to limit flooding of Brisbane**

The Flood Control Engineers continue to confuse the public and would like to confuse the Inquiry with their assertion that the Wivenhoe Dam fuse plugs did not reduce Wivenhoe's water holding capacity, by cleverly correctly claiming that the flood mitigation capacity is still 80mAHD. However, such mitigation capacity is only a theoretical capacity, if the fuse plugs do their job in preventing the lake filling up to the height of the dam wall.

From my 11 March 2011 submission to the Inquiry you will see that at that time, like many others, I did not understand how the fuse plugs work to protect the integrity of the dam wall. I presumed they were a plug inserted near the top of the dam wall, whereas they (all 3) are sections of the dam wall intended to collapse, if there is a failure of the gates to release sufficient water to stop the lake level rising to the full height of the wall. This could come about by a mechanical problem, or maybe the gate engineer having a heart attack, either of which could lead to the dam wall being over-topped, and the wall collapsing, if there was not a fail-safe mechanism.

The term fuse plug has caused many, including me, to misunderstand what they do, and I am indebted to Ian Chalmers, the Supervising Engineer on the construction of Wivenhoe Dam who I met at the Inquiry, who explained the origin of the term. A steam locomotive is powered by steam produced from water in the boiler being heated by a fire below the boiler. If the boiler should run

dry, because the engineer failed to keep it sufficiently full, the engine would over-heat, become distorted and suffer irreparable damage. The clever fail-safe device is a hole near the bottom of the boiler, filled with lead, because it melts at greater than 100 degrees centigrade. The lead plug will not melt so long as it is covered with the water contained in the boiler, as water will not heat above 100 degrees centigrade. However, if the water level drops too low, the lead becomes exposed to the heat produced in the firebox, melting the lead. The melting lead, no longer firmly in place, is pushed out by the water (and steam) still contained in the boiler, which then flows out and douses the fire.

Thus the locomotive fuse plug is a sacrificial part of the boiler wall intended to protect the integrity of the remaining part of the boiler. Maybe the locomotive 'fuse' plug was so named as it is akin to an explosive fuse that sacrificially burns until it does its job. Similarly, the dam fuse plug is a sacrificial part of the wall intended to protect the integrity of the remaining wall, to enable the remaining wall to hold back some of a biblical proportioned inflow.

Before the start of the second day's hearing in Brisbane I asked Senior Flood Control Engineer Robert Ayre how much water the fuse plugs would release. He referred me to the manual. The *Manual of Operational Procedures for Flood at Wivenhoe Dam and Somerset Dam (Revision 7, November 2009)*, on page 57 is a table and a graph that depicts the Wivenhoe Dam Auxiliary Spillway (the spillway formed by the fuse plugs), showing the discharge from each of the 3 fuse plugs, which discloses how much water would be released after Wivenhoe Dam was filled to the top of the 80m AHD dam wall, with all fuse plugs blown, and the rate of water release through the now empty spaces where the fuse plugs had been. As the level drops to 76m AHD the discharge would be 9,033 cubic metres per second (cumecs) and at 74m AHD would be 6,409 cumecs. As we know, release of 4,000 cumecs causes low level flooding of Brisbane, and 7,464 cumecs causes high level flooding, the latter being the outflow rate from Wivenhoe dam on 11 January 2011.

The manual information on page 57 is not the same as what would be released through the fuse plug spaces when the lake is rising. If the lake was rising, the fuse plugs would be blown one after the other, to provide a substantial and **uncontrolled release**, and page 20 of the manual describes that they would blow at 75.7m, 76.23m, and at 76.78m. Such release would be uncontrolled because as the water over-topped the vertical wall of each fuse plug, the water would wash away the gravel that supported the vertical wall, which would then collapse. Having collapsed, the fuse plugs could not be reinstated until the lake is substantially emptied.

If one was to assume that the discharge through each fuse plug space (once they have blown) was in the same proportion as the width of each space is to the total width of the three fuse plugs, then the first one to blow when the lake was 75.5m AHD would release 1,894 cumecs. However, once the lake had risen only a further 530mm to 76.23m AHD the discharge would be 6,864 cumecs, while a further rise of 550mm to 76.78m AHD would release 11,517 cumecs. While it is true that if the lake level rose above 74m AHD, the first fuse plug would release only about 1,894 cumecs, but this would add to the discharge through the gates, thereby causing major flooding of Brisbane. It is also true that if the first fuse plug blew, the gate operator could partially close the gates to reduce the suddenly increased outflow, but at the risk this might cause the second fuse plug to blow, which would cause flooding of Brisbane greater than was experienced in January 2011. Hence the flood control engineers were determined to maintain the lake at 74m AHD.

Flood Control Engineers Malone and Ayre gave evidence of the flows rates on 11 January 2011:

	Inflow cumecs	Outflow cumecs
8am	8,060	2,763
9am	9,165	
10am	10,300	3,347 kept low for fear of back-flooding the Lockyer Creek
11am	9,500	
Noon		3,667
3pm		5,167 to stabilise the lake at 74m AHD the outflow had to increase
5pm		6,463

7pm		7,464
8pm		7,464
11pm		7,464 until progressively reduced to 2,547 cumecs at 9am 12/01/2011

These urgent releases were implemented **not** to avoid the earth wall from collapsing, but rather to prevent the fuse plugs being blown, which would cause major flooding of Brisbane, as only 4,000 cumecs causes low level flooding.

That is not to say there is no danger of the wall ever being over-topped, as with the gates fully open, all fuse plugs blown, and the lake at 80m AHD, the outflow capacity is still only about 28,500 cumecs, and the Probable Maximum Flood inflow (PMF) is 39,000 cumecs.

As the engineers must release water sufficiently to not let the lake rise higher than 74mAHD, to avoid triggering the fuse plugs, why does Seqwater keep insisting that the flood mitigation capacity of Wivenhoe was not diminished when the fuse plugs were built in 2006? The theoretical fact is that the dam wall would still constrain some of a biblical proportioned flood, even with the fuse plugs blown, but it is intentionally deceptive to imply the dam can hold as much as it used to. Deceptive conduct is illegal under the Trade Practices Act.

A crucial point is that the fuse plug reduction of the dam's practical capacity came from the flood 'compartment' (that above Full Supply Level) while the deemed FSL was left at the pre-fuse plug level of 67m AHD. Hence the practical flood mitigation capacity is not its wall level of 80m, but rather when the lake rises to 74m, at which level the dam is 190% full.

Terry Malone admitted that following BOM's briefing to the Premier and Cabinet in October 2010, he had been asked to model the flood reduction possible by temporarily reducing the FSL to 75%. It was disingenuous to do it the way he did, by intentionally not maintaining the modeled reduction for the duration of the expected very wet summer, and then saying it would have made only 200mm to 300mm difference in the Brisbane flood. He modeled the effect of emptying 25% and then allowing it to fill back to 100% from the next usually expected available inflow, before modeling any release. Under cross-examination he admitted that there was other modeling that showed that if the 25% reduction was held as long as possible, by releasing water until the outflows reached 4,000 cubic metres per second (which causes low level flooding in Brisbane), and then allowing the dam to fill to 74mAHD (ie W4), there would have been a 40% reduction in the flood level in Brisbane - about what was always promised - that Wivenhoe will prevent another 1974 flood.

3. DERM's inability to protect the community

DERM's report to your Inquiry states,

"During the Event, Seqwater followed the Department of Environment and Resource Management's draft Communications Protocol, which was compiled after the October 2010 flood event. This Protocol was developed to ensure effective communication between local, State and Commonwealth agencies impacted by the release of flood water from the Dams."

The Flood Control Engineers gave evidence that their delay in increasing outflow after 5 January 2011 was due to concern for the safety of communities below and particularly those close to Wivenhoe Dam – because there was insufficient and ineffective communications with these communities.

The implication of this apparent contradiction is that DERM has shown itself incapable of ensuring effective communications, or that local, other State, and Commonwealth agencies failed the local communities, and the failure to ensure the local communities were warned caused Seqwater to flood Brisbane.

It is vital that effective communications be put in place, otherwise the Flood Control Engineers will always be prevented from quickly implementing flood mitigation strategies to protect Brisbane, for fear of damaging communities nearby. Alternatively, the Flood Control Engineers must ignore the near communities' safety when there is danger of causing a major flood in Brisbane.

Conclusions

The fact that rainfall forecasts cannot be precise requires them to be regarded with precaution rather than being disregarded. Seqwater were warned by BOM to regard their forecasts with precaution, that is, with additional caution.

An anesthetist has authority to order the surgeon to stop the operation, if the patient appears unlikely to survive further exposure to the anesthetic. Similarly, the Flood Control Operations Engineers should be subject to being over-ruled when BOM considers that the Flood Control Operations Engineers are not sufficiently releasing water to protect Brisbane.

If people die as a result of professional negligence, the person responsible for directly or indirectly causing the death(s) may be charged with manslaughter. I suggest that the Premier and all of Cabinet, as well as all senior officers of DERM and the Flood Control Engineers that failed to ensure that BOM's warnings were heeded, should be so charged. Also, the Queensland Government should immediately compensate those who have suffered, for their financial losses.

Considering that the extraordinary peak inflows to Wivenhoe Dam early on 11 January 2011 caused the lake to rise 3m quickly, we are lucky that the lake was not then already at 73m AHD, as Brisbane may have suffered a catastrophic flood. Until Brisbane is served by another major dam, which can enable Wivenhoe greater scope to mitigate flooding Brisbane, I suggest W4 be reduced to 70m AHD.

Having listened to the first week of the Brisbane hearings, I respectfully suggest you should obtain answers to these 58 questions:

Regarding the evidence of Minister Robertson

1. Following Cabinet's 18 October 2010 briefing by Mr Davidson, Queensland CEO of the Bureau of Meteorology, **what did Minister Robertson do** to ensure the Water Grid Manager, **and Seqwater dam engineers**, were briefed about the impending La Nina weather event?
2. Considering that Mr Davidson had given Cabinet **the most explicit warning** of the impending severe La Nina weather event, **why did Minister Robertson "not accord Mr Davidson's warning any significance."**
3. Following BOM Senior Forecaster Peter Bradley's briefing to Cabinet regarding the possible effect of the intense high level low-pressure system, **why did Minister Robertson not ensure that Seqwater obeyed the requirement of the Flood Control Manual to keep the lake level at the FSL of 67m AHD?**
4. When did Minister Robertson learn that with the FSL at 67m AHD, Wivenhoe Dam had far less flood mitigation capacity than existed before the fuse plugs were built?
5. When did Minister Robertson learn how the fuse plugs at Wivenhoe Dam operate?
6. When did Minister Robertson learn that the fuse plugs activate when the lake level reaches 75.7m AHD, thereby causing the capacity for Wivenhoe Dam to prevent flooding of Brisbane to be reduced from 80m AHD by 4.3m, ie by approximately 33% ($80 - 67 = 13\text{m}$ of theoretical flood mitigation capacity, and $4.3 / 13 = 33\%$)?

7. When did Minister Robertson learn that W4, which floods Brisbane, is initiated when the lake level reaches 74m AHD, thereby causing the fuse plugs to reduce the **practical capacity for Wivenhoe Dam to prevent flooding of Brisbane by approximately 46%** ($80 - 67 = 13$, and $6 / 13 = 46\%$)?

8. Because the flood control engineers contend that the capacity of Wivenhoe to mitigate flooding was not diminished by the fuse plugs, when did Minister Robertson learn that at initiation of W4, the FSL + the practical flood compartment = 190%, and that therefore the capacity of Wivenhoe Dam to avoid flooding Brisbane was far less than the dam engineers contend by their deceptive reference to flood mitigation capacity?

9. Why did Minister Robertson assert that he understood that *“there was enhanced management of the rain event.”*

As Minister Robertson evidenced that he was satisfied the Water Grid Manager was managing the La Nina event satisfactorily by keeping the FSL at 100%, when did he learn that the FSL had exceeded 100%, and thereby the capacity for Wivenhoe Dam to avoid flooding Brisbane was reduced as follows :

Jan.	FSL %	Flood compartment %
6	103	87
7	106	84
8	Not revealed by Seqwater in	
9	the information provided.	
10 morning	140	60
10 evening	154	46
11 morning	173	17
11 5.19 pm	190	nil

10. Did Minister Robertson ever require the dam operator to advise what needed to be done to ensure the requirements of W1 and W2, did not handicap the operator from mitigating the flooding of Brisbane?

Regarding the evidence of Seqwater Senior Flood Operations Engineer Robert Ayre

11. Why did Mr Ayre ignore the possibility of the monsoonal front moving south and reduce the dam level from 5 January 2011, instead of allowing the dam level to exceed FSL?

12. Would Mr Ayre now accept that a monsoonal front needs to be given special precautionary attention?

13. As the lake must not be allowed to exceed 74m, which corresponds to 90% of the FSL, does Mr Ayre acknowledge that the practical limit of the flood storage compartment is only 90% of the FSL?

14. Does Mr Ayre acknowledge that Seqwater has been deceptive when suggesting that Wivenhoe Dam has a flood mitigation capacity of 143% of the FSL? (falsely stated flood compartment of 1.65 million megaliters / FSL of 1.15 megalitres)

15. If Mr Ayres maintains that the 80m dam wall could still act to mitigate flooding, does this imply that the fuse plugs may not limit the rise of the lake to 80m?

16. If so, does this imply that the fuse plugs are insufficient to prevent Wivenhoe Dam wall collapsing?

17. Has Mr Malone's modeling, and the data used in his modeling, of the effect of mitigating flooding of Brisbane by various reductions of the FSL been verified independently?
18. Given that the substantial rainfall on 10 & 11 January 2011 exceeded the BOM forecasts, should the BOM forecasts now be treated as conservative, instead of being disregarded as uncertain?
19. Does Mr Ayre acknowledge that BOM Senior Forecaster Peter Bradley had advised that the BOM forecasts in January 2011 should be treated as cautionary?
- 20. Does Mr Ayer acknowledge that if the engineers had accepted the BOM rain forecasts, and commenced releasing water at the rate of 4,000 cubic metres / second, 36 hours before they initiated W4, the flooding of Brisbane would have been minor rather than major?**
21. Mr Ayre gave evidence that *precautionary release = precautionary flooding*, but does Mr Ayre concede that precautionary release does not = precautionary flooding, if the release commences early enough to avoid flooding?
22. Mr Ayre gave evidence that he would not support the concept of reducing the FSL on a seasonal basis, but would he agree that the FSL should be reduced when the BOM warns of a particularly wet summer?
23. In view of Ipswich being 'back-water' flooded in 1974, why did Mr Ayre not ensure modeling was carried out of such an effect before the 2011 flood event?
24. Why did Mr Ayre not ensure that Mr Malone modeled a 25% reduction of the FSL for the full period of the expected very wet summer, that is keeping the 25% reduction by releasing water until outflow at 4,000 cubic metres / second would not maintain the 25% reduction, and only then allowing the lake level to rise?
25. Does Mr Ayre agree with Mr Malone's evidence that Fernvale would not have been flooded if the flood was 2m lower, which could have been achieved by earlier release than the later high release rate?
26. Mr Ayre asserted that the level to initiate W4 was 74m and that this had been the same before and after the fuse plugs were built. As the W4 requirement after the fuse plugs were built was to prevent the fuse plugs from being triggered, does this indicate W4 was more concerned to prevent flooding of Brisbane than to protect the dam wall from being over-topped?
27. If before the fuse plugs were built it was considered necessary to move to W4 when the lake level was 6m below the dam wall, does this indicate that this safety margin was considered necessary due to the possibility of such very heavy inflow occurring that at least a 6m buffer was required?
28. If so, should the possibility of such heavy inflow since the fuse plugs were built require a 6m buffer below the fuse plugs, rather than the just 1.7m buffer that exists between 74mAHD and the lowest fuse plug at 75.7mAHD?
29. Does Mr Ayre acknowledge that if W4 had to be initiated when the lake level was 6m below the lowest fuse plug, that is at 68mAHD, the **practical capacity for Wivenhoe Dam to prevent flooding of Brisbane** would be substantially lower than it now is, as W4 would only be 1.0m above the current FSL of 67m?
30. Does Mr Ayers acknowledge that as the lake level rose about 3m due to the exceptional rainfall on 11 January 2011 that did not fall in the rain gauges around the dam, the current buffer of 1.7m of W4 below the lowest fuse plug may be quite insufficient to avoid flooding Brisbane?

31. Does Mr Ayers acknowledge that for Wivenhoe Dam's practical flood compartment volume to be equal to the full supply volume, the FSL would need to be significantly lower, and that Brisbane would need a substantial additional water storage dam?

Regarding the evidence of Mr Jim Davidson, Qld Regional Director, Bureau of Meteorology

32. Did Mr Davidson gain the impression that the Premier and Cabinet viewed his 18 October 2010 warnings to be significant?

33. Did Mr Davidson believe that Peter Bradley gained the impression that the Premier and Cabinet viewed his warnings on 5 January 2011 to be significant?

34. Was Mr Davidson surprised that Minister Robertson gave evidence that he considered the BOM warnings to "*not be significant*"?

Evidence of Mr John Ruffini, Flood Operations Engineer

35. As the DERM Director, Water Planning Services, why has Mr Ruffini not carried out a simulation of W4 before the January flooding of Brisbane?

36. Who is responsible to ensure implementation of W4 was simulated?

37. Why has some of the manual available to the public been redacted?

38. Mr Ruffini said he was concerned about releasing water when the monsoon front was close, in case it bypassed Wivenhoe Dam and dumped into urban Brisbane, as his release would then make a bad situation worse. Why did he and the other engineers not release water when the monsoon front was distant, when such release would not cause back-flooding of the Bremer River and Lockyer Creek, and could have been achieved without flooding Brisbane?

39. Is maintaining the FSL at 67m more important than flooding Brisbane?

40. What should the FSL be, to equate the risks of Brisbane running out of water, and being flooded?

Evidence of Mr Terry Malone, Flood Operations Engineer

41. Considering the experience of 1974, and Mr Malone's experience when working for BOM, why did he ignore the 5 January 2011 warnings of the monsoon front?

42. Did he raise concerns that the BOM warnings should not be ignored?

43. Would the need for Mr Malone to request the fuse plug equations have been obviated if W4 had been simulated?

44. Why did Mr Malone model the reduction of FSL to 75%, but then not keep it at that level in his model for the duration of the anticipated wet season?

Evidence of Mr John Tibaldi, Principal Engineer Dam Safety & Flood Operations Engineer

45. Mr Tibaldi stated that he considered there were 3 circumstances when BOM forecasts should be given weight, the first one being; rainfall prediction due to a very large, slow moving rainfall system. Why then was the BOM warning of the slow moving monsoon front, ignored?
46. Would a BOM rain forecast due to a fast moving large rainfall system be ignored?
47. Could the BOM forecasts be heeded even if they could not be factored into a model run?
48. If the BOM forecast regarding the monsoon front gave warning of the need for impending disaster management, why was it ignored?
49. Will the urban sprawl of Brisbane and Ipswich prevent effective flood control measures to be implemented to prevent future flooding of Brisbane and/or Ipswich?
50. Does Mr Tibaldi acknowledge that the failure to react to the early BOM monsoonal rain forecast resulted in action being left too late to avoid flooding Brisbane?
51. Does Mr Tibaldi agree that flexibility for the engineers to determine strategies must be tempered with the requirement for them to take greater heed of the advice from experts in weather systems?
52. Does Mr Tibaldi acknowledge that despite BOM's short-term forecast not predicting the 2 peak rain events on 10 & 11 January, its forecasts correctly indicated that W4s should have been initiated 36 hours earlier than it was?
53. Does Mr Tibaldi acknowledge that as he is not a weather expert, his conjecture of how much reliance should be afforded to the BOM forecasts, puts lives and property at risk?
54. Does Mr Tibaldi acknowledge that he and his fellow flood control engineers usurped the role of the weather experts?

Questions related to misinformation

55. Why did Seqwater not release to the public its 1180 page flood control engineers' log until late on Monday 7 March 2011, just 4 days before the Commission of Inquiry's first deadline for submissions?
56. Why does Seqwater indicate that floodwaters take 24 to 36 hours to travel from Wivenhoe Dam to Brisbane, when it has been shown that the time is more likely to be only about 12 hours?
57. Considering the revelation that Somerset Dam was not filled to its capacity in January 2011 because of concern that its wall would break, why does Seqwater maintain that Somerset Dam capacity to mitigate floods is undiminished?
58. If Somerset Dam was full on 10 January 2011, and its wall broke, would the fuse plugs of Wivenhoe Dam have been triggered?

Yours sincerely,

David Stark