DENNIEN

QFCI

JM

Date: 18/05/11

Exhibit Number: 417

Statement by Barry Kevin Dennien, sworn on 5 April 2011

1. I, Barry Kevin Dennien of Level 15, 53 Albert Street, Brisbane, Queensland, the Chief Executive Officer of the South East Queensland Water Grid Manager (**Water Grid Manager**) state the following on oath.

2. In this statement to the Queensland Floods Commission of Inquiry, as required in the letter to me dated 25 March 2011 (**letter**), I:

   a. have provided all the information in my possession and identify the source or sources of that information; and,

   b. make commentary and provide opinions I am qualified to give as to the appropriateness of particular actions or decisions and the basis of that commentary or opinion.

3. I provide this statement only in respect of the topics listed in the letter. I address each of those topics separately below.

TOPIC 1: THE REPORTING STRUCTURE OF THE SOUTH EAST QUEENSLAND WATER GRID MANAGER TO RESPONSIBLE MINISTERS

4. The Water Grid Manager has, since it came into existence on 1 July 2008, reported to two responsible Ministers.

5. In the period between 1 July 2010 and 21 February 2011, the Water Grid Manager reported to:

   a. The Minister for Natural Resources, Mines and Energy and Minister for Trade, who was, at all relevant times, the Honourable Stephen Robertson MP; and

Signed: [redacted]

Barry Kevin Dennien

Taken by: [redacted]

[Justice of the ~~Peace~~/Solicitor]

b. The Treasurer and Minister for Employment and Economic Development, who was, at all material times, the Honourable Andrew Fraser MP.

6. The Water Grid Manager has, since 21 February 2011, reported to the following two responsible Ministers:

   a. The Minister for Finance and the Arts, the Honourable Rachel Nolan MP; and

   b. The Minister for Energy and Water Utilities, the Honourable Stephen Robertson MP.

7. The reporting structure of the Water Grid Manager to the responsible Ministers is dictated by Administrative Order. The relevant Administrative Orders are as follows:

   a. Administrative Arrangements Order (No. 1) of 2010.

   b. Administrative Arrangements Order (No. 1) of 2011.

8. Copies of those documents are attached as **Annexure A** to my statement.

TOPIC 2: THE REPORTING STRUCTURE OF SEQWATER TO THE SOUTH EAST QUEENSLAND WATER GRID MANAGER

9. As a preliminary matter, I would point out that Seqwater, which is the trading name of the Queensland Bulk Water Supply Authority, also reports directly to the same two Ministers as the Water Grid Manager, by virtue of the same Administrative Orders referred to above.

10. Seqwater 'reports' to the Water Grid Manager pursuant to the Contract between Seqwater and the Water Grid Manager. That Contract was made by the Minister pursuant to Section 360ZDD of the *Water Act 2000* (Qld) (as amended).

Signed: [redacted]

Barry Kevin Dennien

Taken by: ... [redacted]

[Justice ~~of the Peace~~/Solicitor]

11. A copy of that Contract (as it presently exists) is attached as **Annexure B** to my statement. Under that Contract, Seqwater supplies water services to the Water Grid Manager, including the storage, treatment and transport of water to SEQ Water Grid Customers.

12. Seqwater also 'reports' to the Water Grid Manager pursuant to various communication protocols. Those include:

    a. The 'OCA Information Protocol' by which all Grid Participants enter information into the OCA Incident Manager, the ICT platform for the exchange and communication of information for managing and responding to emergencies under the SEQ Water Grid Emergency Response Plan;

    b. The 'SEQ Water Grid coordinated communications implementation plan', which requires Seqwater to communicate with the public, the Minister and others through the Water Grid Manager;

    c. The current draft of the protocol for the communication of flooding information for the Brisbane River Catchment – including flood water releases from Wivenhoe and Somerset Dams. That protocol requires, amongst other things, that the Water Grid Manager is to centrally track all communications dealing with flood water releases and is responsible for liaising with Seqwater and others in order to coordinate communications related to flood water releases. Seqwater is specifically required, under the protocol, to provide technical situation reports to the Water Grid Manager insofar as any releases are proposed or undertaken.

TOPIC 3: MY OPINION AS TO WHETHER THE CAPACITY OF THE WIVENHOE AND SOMERSET DAMS ('THE DAMS') IS ADEQUATE FOR WATER SECURITY

13. I do have an opinion about whether the capacity of the Wivenhoe and Somerset Dams

Signed: [redacted]
Barry Kevin Dennien

Taken by: [redacted]
[Justice ~~of the Peace~~/Solicitor]

is adequate for water security. However, I am assuming that by 'water security', the Commission is referring to the ability of the Dams to provide adequate drinking water for that part of the South East Queensland region that is served by the Dams. This is principally the greater Brisbane area, Logan, the Gold Coast, Redlands, Moreton, Ipswich and the North Coast area excluding Noosa. This is also known as the connected Water Grid.

14. My opinion is based on my experience working as the Chief Executive Officer of the Water Grid Manager and previously in water supply and security for the Queensland Water Commission (**QWC**) and the Brisbane City Council.

15. In my opinion, the capacity of the Dams is adequate for water security (as defined above) up until at least 2017, when combined with the assets of the Water Grid as a whole. I refer the Commission to the 'South East Queensland Water Strategy', a copy of which is attached as **Annexure C** to my statement, which points out that supply is currently adequate up until at least somewhere between 2017 and 2032.

16. If the Dams were used for the purposes of ensuring water security in isolation, the capacity of the Dams would not be adequate, as was evidenced by the Millennium Drought experienced in South East Queensland beginning in 2001.

TOPIC 4: MY OPINION AS TO WHETHER THE CAPACITY OF THE DAMS IS ADEQUATE FOR FLOOD MITIGATION

17. I do not consider that I have the appropriate professional or other qualifications and access to the information necessary to provide a considered opinion to the Commission as to this topic.

18. In my view, the opinion sought ought to be obtained from a hydrologist and possibly other experts.

Signed: [redacted]..

Barry Kevin Dennien

Taken by: [redacted]

[Justice ~~of the Peace~~/Solicitor]

19. In my experience working for the Water Grid Manager (or previously), I have not looked at the capacity of the Dams insofar as it relates solely to flood mitigation.

20. However, I consider that I should provide some views relevant to this topic based upon my observations and experience working as the Chief Executive Officer of the Water Grid Manager:

    a. First, I would like to make the observation that the Dams only contain 50% of the rainfall catchment area which could cause flooding downstream from the Dams. Therefore, in considering the Dams' capacity to provide Flood Mitigation, it must be recalled that the Dams will only ever deal with 50% of the possible problem and other solutions for the flooding risks posed by the rainfall downstream should be considered.

    b. Secondly, I would like to point out that the flood mitigation capacity of the Dams will be driven by the operation of the Manual of Operational Procedure for Flood Mitigation at Wivenhoe Dam and Somerset Dam (**Flood Mitigation Manual**). In broad terms, the objectives of the Flood Mitigation Manual (listed on page 1) are, in my opinion, acceptable. The prioritisation and definition or measurement methodology of the objectives, appear appropriate. I cannot comment on the appropriateness of the trigger points at which water is released and the release rates for each strategy to achieve each objective in the Flood Mitigation Manual as I am not qualified to do so, and nor do I have access to the appropriate information which would enable me to form such an opinion.

    c. Thirdly, I would observe that in making any permanent changes to the Flood Mitigation capacity of the Dams, the trade-offs with other impacts ought to be considered. For example, it has been indicated that the Dams could provide greater flood mitigation if some water security was sacrificed, i.e. the Full Supply

Signed: [redacted]

Barry Kevin Dennien

Taken by: [redacted]

[Justice of ~~the Peace~~/Solicitor]

Level permanently lowered. Alternatively, the bridges downstream could be increased in size in order to mitigate against smaller flooding events, houses in flood prone areas could be bought back from their owners and other parts of the catchment downstream of the dam could have flood mitigation devices installed. A balancing exercise, in which all solutions are tabled and considered, should be undertaken before long-term decisions are made about whether the Dams (in isolation) are the solution to risks of flooding.

TOPIC 5: THE WATER SECURITY NEEDS OF SOUTH EAST QUEENSLAND UP UNTIL 2050 AND THE ABILITY OF THE DAMS TO MEET THOSE NEEDS

21. I would make the point that the Dams are not the sole means by which water security is provided for South East Queensland. Water security for South East Queensland is provided through the entire Water Grid. The Water Grid includes includes 12 connected dams, 10 connected drinking water treatment plants, three advanced water treatment plants producing purified recycled water, 28 water reservoirs, one desalination plant, 22 bulk water pump stations and 535 km of drinking water bulk water mains. In addition, water security is a function of both supply and demand management.

22. Prior to 1 July 2008, there were approximately 22 different bodies which were involved in the management and supply of water in South East Queensland, including Seqwater, the owner of the Dams. Those bodies were responsible for:

    a. The bulk supply of water;

    b. The treatment of water;

    c. The transport of bulk water;

Signed: [redacted]

Barry Kevin Dennien

Taken by: [redacted]

[Justice of the Peace/Solicitor]

d. The distribution in the retail sale of water; and

e. Wastewater collection and treatment.

23. All of those bodies had an impact, through their activities, on water security in South East Queensland.

24. The QWC was established in order to provide strategic advice to the Minister in relation to the water security in South East Queensland and the Water Grid Manager was established to operate the Water Grid to ensure that the strategic objectives set by the QWC were achieved (thus achieving water security).

25. The water security needs of South East Queensland up to 2050 are discussed in detail in a document entitled 'South East Queensland Water Strategy' (a copy of which is attached as **Annexure C** and discussed in paragraph 15 above). This Strategy has three key components. Firstly, it establishes a clear measurable objective, namely a water supply level of service. Secondly, it provides that demand for water should be managed in an efficient appropriate way for domestic and industrial uses. Thirdly, it regulates the operation of the Water Grid. That document was produced by the QWC and I believe it provides the requisite information to the Commission of Inquiry.

26. From 1 July 2008, largely via the *South East Queensland Water (Restructuring) Act 2007* (Qld), the South East Queensland Water Grid was established. The purpose of the establishment of the Water Grid was to increase and diversify water supply by building a new dam, groundwater supplies, and climate resilient desalination and recycled water supplies and connecting these and the existing water assets in South East Queensland to provide a uniform guaranteed water supply level of service. Secondly, it was to provide governance and institutional structure that enables a transparent separation of policy and planning functions from the efficient delivery of the water supply guarantee for South East Queensland.

Signed: [redacted]

Barry Kevin Dennien

Taken by: [redacted]

[Justice of ~~the Peace~~/Solicitor]

27. If the Dams were not connected to the Water Grid, and the current structure did not exist, in my opinion they would not be adequate for providing water security for South East Queensland up until 2050.

TOPIC 6: HOW THE FULL SUPPLY LEVEL WAS ORIGINALLY DETERMINED WHEN THE WIVENHOE DAM WAS BUILT AND THE REASONS FOR ANY SIGNIFICANT AMENDMENTS TO THE FULL SUPPLY LEVEL SINCE THAT TIME

28. I am not aware of how the Full Supply Level for Wivenhoe Dam (assuming that is the relevant Full Supply Level referred to) was originally determined when the Wivenhoe Dam was built. Nor am I aware of the reasons for any significant amendments to the Full Supply Level since that time.

TOPIC 7: MY ROLE IN RELATION TO THE FULL SUPPLY LEVEL OF THE DAMS

29. I do not have a direct role in relation to the Full Supply Level of the Dams.

30. The Full Supply Level affects two outcomes the Dams deliver: water supply and flood mitigation. Water supply policy and objectives are the responsibility of the QWC. It provides advice on those topics to the Minister for approval. The flood mitigation function of the Dams is managed by Seqwater which provides advice and the operating strategy of the Dams via the Flood Mitigation Manual. This latter document is also provided to the Minister for approval.

31. The Water Grid Manager is (and I as the Chief Executive Officer of the Water Grid Manager are) consulted if any changes to the water levels in the Dams are proposed. The reason the Water Grid Manager is consulted is because it is responsible for

Signed: [redacted]

Barry Kevin Dennien

Taken by: [redacted]

[Justice of the Peace/Solicitor]

ensuring the operation of the Water Grid to achieve the strategic objectives set by the QWC so as to provide for water security. In that sense, I have an indirect role (as Chief Executive Officer of the Water Grid Manager) with the determination on Full Supply Level.

32. Further, pursuant to the South East Queensland System Operating Plan (**System Operating Plan**) and the relevant legislation, including the *South East Queensland Water (Restructuring) Act 2007* (Qld), the Water Grid Manager is responsible for buying water services from the bulk water suppliers (including Seqwater) and selling that water to the customers in the Water Grid. The System Operating Plan provides that the Water Grid Manager is allocated up to a maximum of 450,000 megalitres of water per year from the Water Grid. This allocation is the combination of water volumes from each individual source including the Dams. In that sense, where any changes to the Full Supply Levels of the Dams have the potential to impact upon the ability of the Water Grid Manager to fulfil its obligations under the System Operating Plan, I would have an indirect role to play (again, as Chief Executive Officer of the Water Grid Manager) in determining the Full Supply Levels. I would expect to be consulted so that the Water Grid Manager could advise upon the impacts of any change to Full Supply Level on its ability to provide water security for South East Queensland by complying with the mandate it receives from the QWC.

33. This process is consistent with the practice that was conducted over the period leading up to January 2011. For example, in December 2010, requests were made from Seqwater for Hinze Dam water levels to be lowered below Full Supply Level to allow construction works to be carried out. The Water Grid Manager assessed the operation of the Water Grid to achieve the strategic objectives set by the QWC so as to provide

Signed: [redacted]

Barry Kevin Dennien

Taken by: [redacted]

[Justice of the Peace/Solicitor]

for water security[1], then checked with the QWC that it had no objections from an overall water security perspective.

TOPIC 8: MY ROLE IN ANY AMENDMENT TO THE FULL SUPPLY LEVELS OF THE DAMS

34. Again, I do not have any direct role in determining any amendment to the Full Supply Levels of the Dams.

35. For the reasons expressed above, I would have an indirect role in any amendment to the Full Supply Levels of the Dams, insofar as I would expect to be consulted (as Chief Executive Officer of the Water Grid Manager) should any change to the Full Supply Level be contemplated (so that the Water Grid Manager could advise whether or not change to the Full Supply Level of the Dams would impact upon its ability to comply with the strategic objectives laid down in the System Operating Plan and otherwise provide water security for South East Queensland).

TOPIC 9: MY ROLE IN RELATION TO DAM OPERATIONS AT WIVENHOE, SOMERSET AND NORTH PINE DAMS

36. The Water Grid Manager does have a communications function insofar as releases are proposed from Wivenhoe, Somerset and North Pine Dams. This is pursuant to the draft communications protocol discussed above, a copy of which is attached as **Annexure D** to my statement. That is the extent of my role (as Chief Executive Officer of the Water Grid Manager) in relation to dam operations at Wivenhoe, Somerset and North Pine Dams.

[1] Principally by having hydrological modelling undertaken to ensure that the reduction would not impact upon the ability of the Water Grid Manager to deliver the requisite service levels.

Signed: . [redacted]

Barry Kevin Dennien

Taken by: . [redacted]

[Justice ~~of the Peace~~/Solicitor]

TOPIC 10: WHEN, HOW AND WHY THE FULL SUPPLY LEVELS FOR THE DAMS, WHICH EXISTED AT THE TIME OF THE JANUARY 2011 FLOOD EVENT, WAS DETERMINED

37. I do not know when, how or why the Full Supply Levels for the Dams, which existed at the time of the January 2011 flood event, were determined.

TOPIC 11: AN ACCOUNT OF ALL DISCUSSIONS, CORRESPONDENCE, MEETINGS OR BRIEFINGS FROM 1 SEPTEMBER 2010 TO 31 MARCH 2011 I WAS INVOLVED IN REGARDING POTENTIAL CHANGES TO THE FULL SUPPLY LEVELS

38. To the best of my recollection, I was not involved in any discussions, correspondence, meetings or briefings from 1 September 2010 to 31 March 2011 regarding potential changes to the Full Supply Levels. As discussed below, I was involved in a number of discussions, meetings, briefings and exchanges of correspondence that dealt with a temporary reduction in the water levels of the Dams below Full Supply Levels.

TOPIC 12: PROVISION OF ALL NOTES MADE OF ALL DISCUSSIONS OR MEETINGS REGARDING POTENTIAL CHANGES TO THE FULL SUPPLY LEVELS BETWEEN SEPTEMBER 2010 TO MARCH 2011

39. I do not have any notes from any discussions or meetings regarding potential changes to the Full Supply Levels between September 2010 and March 2011.

TOPIC 13: MY OPINION AS TO WHAT THE FULL SUPPLY LEVELS OF THE DAMS SHOULD BE

40. I do not know what the Full Supply Levels of the Dams should be.

Signed: .. [redacted] ..
Barry Kevin Dennien

Taken by: . [redacted]
[Justice ~~of the~~ Peace/Solicitor]

41. I do not consider that I am qualified to provide such an opinion and it ought to be obtained from a hydrologist or possibly another expert in this area. Further, I do not consider that I have sufficient information upon which I could form such an opinion.

TOPIC 14: HOW (IN TERMS OF REGULATORY OR LEGISLATIVE CHANGES, DIRECTIVES TO OPERATORS, ETC), AND WHY THE AMOUNT OF WATER IN THE DAMS WAS DECREASED IN FEBRUARY 2011

42. I was not directly involved in the reduction of the Dam levels and do not know how the amount of water in the Dams was authorised to be decreased in February 2011.

43. The extent of my knowledge of why the amount of water was decreased is set out below in my response to topic 16. I understand that the amount of water in the Dams was decreased because, on 20 January 2011, the Minister requested Seqwater to advise whether the amount of water in the Dams could be decreased temporarily and Seqwater advised that it could be decreased for the reasons set out in their letter dated 4 February 2011. Copies of those letters are attached.

TOPICS 15 AND 16: DETAILS, INCLUDING VERBATIM ACCOUNTS WHERE POSSIBLE, OF ANY DISCUSSIONS, CORRESPONDENCE, MEETINGS OR BRIEFINGS REGARDING DECREASING THE DAMS LEVEL OR RELEASING WATER FROM THE DAMS TO DECREASE THEIR LEVEL IN DECEMBER 2010 OR JANUARY AND FEBRUARY 2011 (BUT WITHOUT ALTERING THE FULL SUPPLY LEVEL)

44. I would like to make two preliminary observations in answer to these topics:

    a. First, I attach, as **Annexure E** to my statement, copies of all letters and emails I

Signed: .. [redacted]

Barry Kevin Dennien

Taken by: .. [redacted]

[Justice of the Peace/Solicitor]

have sent or received in the period between 1 October 2010 and 9 February 2011 insofar as they relate to releasing water from the Dams to decrease levels. I have included letters, emails and discussions from 1 October 2010 because the events in December 2010 and January 2011 would not make sense without referring to those. Similarly, I attach copies of all notes I made at any meetings or briefings that relate to releasing water from the Dams to decrease levels in the same period.

b. Secondly, I would like to make it clear that I do not have a verbatim recollection of the discussions referred to below. I can recall the effect of the words that were used at various meetings and in certain discussions, but I cannot remember the exact words used. The statements I make below reflect the effect of what was discussed, to the best of my recollection after having refreshed my memory from various documents (copies of which are attached as discussed below).

45. A summary of all of the relevant correspondence I have been able to locate (with the assistance of my staff at the Water Grid Manager), and an account of all the relevant meetings, discussions and briefings I can now recollect, is set out below.

46. On 25 October 2010, the Minister wrote to the Chair of the Water Grid Manager.[2] I understand, from discussions with Mr Daniel Spiller (the operations director of the Water Grid Manager), that the letter was drafted in consultation with the Water Grid Manager. In particular, I understand from Mr Spiller that he drafted the text of the letter having spoken with the Office of the Water Supply Regulator, Department of Environment and Resource Management (**DERM**) and Seqwater about it.

47. In that letter, the Minister sought advice regarding options to and benefits of releasing water from key storages in anticipation of major inflows over the coming summer. In doing so, the Minister noted that recent releases from Wivenhoe Dam at that stage

[2] Mr Gary Humphrys

Signed: .. [redacted]

Barry Kevin Dennien

Taken by: [redacted]

[Justice of the Peace/Solicitor]

(October 2010) had resulted in significant inconvenience and isolation for residents in some downstream areas. The Minister sought a response by the end of November 2010 as to the available options and likely benefits.

48. I understood, and understand, that this letter was directed to the Water Grid Manager as having responsibility for the Water Grid communications and insofar as the inquiry made by the Minister may have the potential to affect the short term supply of water to South East Queensland (given that the reduction was only proposed to be on a temporary basis) and the Water Grid Manager's ability to comply with the System Operating Plan.

49. On 25 October 2010, Dan Spiller wrote (by email) to Jim Pruss from Seqwater, copied to me, advising that the Water Grid Manager understood we would receive a letter requesting advice as to available options and likely benefits of releases from dams including Wivenhoe Dam and stating that that letter would be forwarded as soon as possible.

50. The Water Grid Manager also communicated the likelihood of the letter arriving from the Minister to the QWC, by way of an email dated 26 October 2010 at 7:37am from me to Ms Karen Waldman of the QWC[3]. This email was sent by me as a courtesy and because the Minister's request had the capacity to impact upon the overarching strategy for the management of the State's water resources (a matter within the Commission's remit).

51. On 28 October 2010, I received the Minister's letter in the mail.

52. On 28 October 2010, I forwarded to Karen Waldman from the QWC a copy of the Minister's letter.

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[3] Its Chief Executive Officer

Signed: .. [redacted]

Barry Kevin Dennien

Taken by: .. [redacted]

[Justice of the Peace/Solicitor]

53. On 2 November 2010, I wrote to Mr Peter Borrows, the Chief Executive Officer of Seqwater, confirming that the Minister had sought urgent advice about whether the volume of water stored in the Dams could be reduced as a means of reducing the severity, frequency and duration of flooding in downstream areas. I enclosed a copy of the Minister's request and I sought Seqwater's advice by 19 November 2010.

54. On or around 10 November 2010, Mr Jim Pruss from Seqwater provided to Dan Spiller a draft advice by Seqwater's dam safety experts. Mr Spiller subsequently sent a copy of that email to me. The document from Seqwater examined a range of different scenarios for the reduction of the water level in Seqwater's gated dams to improve short term flood mitigation benefits. Amongst other things, the advice noted that, for major flood events impacting on urban areas, it was unlikely that peak water levels in Brisbane would be significantly impacted by minor reductions in the level of the Wivenhoe Dam and that reductions in dam volume in the order of at least 250,000 megalitres would be needed to provide any significant reduction in water level peaks experienced in urban areas. That advice also noted that such reductions would not necessarily guarantee reductions in urban flood levels because the distribution of rainfall in the Brisbane River catchment governed the extent of possible urban flooding.

55. On or about 18 November 2010, I asked Jim Pruss[4] and Rob Drury[5] to attend a meeting on 23 November 2010, at the offices of the Water Grid Manager, in order to discuss the draft advice provided by Seqwater on 10 November 2010 and the response to the Minister's letter. To the best of my recollection, I made that invitation by having my personal assistant send an invitation in Outlook to those gentlemen on that day.

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[4] The Executive General Manager, Water Delivery for Seqwater.

[5] The Dam Operations Manager for Seqwater.

Signed: ... [redacted] .

Barry Kevin Dennien

Taken by: ... [redacted]

[Justice ~~of the Peace~~/Solicitor]

56. That meeting occurred on 23 November 2010. Attendees were myself and Dan Spiller from the Water Grid Manager and Jim Pruss and Rob Drury from Seqwater. At the meeting:

    a. Messrs Pruss and Drury summarised the views of Seqwater as to the issues raised by the Minister in his letter dated 25 October 2010;

    b. Mr Spiller and I asked a number of questions as to the content of the report and the basis of the Seqwater advice about flood events involving total flows less than and greater than 3500 cubic metres per second measured at the Moggill gauge. In particular, we asked whether any modelling had been done with regards to large flood events involving total flows greater than 3500 cubic metres per second measured at Moggill gauge and whether that would be of any benefit;

    c. Mr Drury advised that no modelling had been done on the higher flows and suggested that such modelling would take at least 6 months to perform.

    d. Messrs Pruss and Drury stated to the effect that Seqwater's opinion was that:

        i. the dam only controlled 50% of the Brisbane River catchment and therefore only had part control of flood impacts;

        ii. whilst it was possible pre-emptive major releases of water from Wivenhoe Dam lowering the water level below Full Supply Level may have some benefit for flood mitigation, Seqwater's view was that major releases of water may not be of benefit for flood mitigation because it depended on the rainfall distribution during a flood event and that would not likely have any significant impact upon the height of floods downstream in the event that there was a major rainfall event;

Signed: 

Barry Kevin Dennien

Taken by: 

[Justice ~~of the Peace~~/Solicitor]

iii. the unpredictability of weather forecasting made it difficult to judge releases from the dam to pre-emptively lower the storage if they were to be just hours or days before or during a flood event. Even releases well before a rainfall event would be difficult to manage. The releases might impact upon water supply security or damage property (such as bridges) downstream and impose a significant inconvenience and danger to residents downstream with no benefits if rain did not fall in the catchment above the dam wall; and

iv. before any major releases were done to lower the dam below Full Supply Level, significant studies should be performed to determine whether the benefits outweighed the detriment to persons and property downstream from the Dams.

57. At the conclusion of the meeting, Mr Drury agreed to provide further written information in response to the questions asked by Mr Spiller and me during the meeting and report back to us as soon as was possible so that advice could be provided to the Minister, as he had requested.

58. On 1 December 2010, I emailed Messrs Pruss and Drury following up on their discussions on 23 November 2010 with regard to dam levels and flood impacts and advised that we were due to respond to the Minister by the end of November.

59. On 2 December 2010, Mr Drury sent me (copied to Mr Pruss and Mr Borrows) a draft report.

60. On 3 December 2010, I responded to Mr Drury (copied to Mr Pruss, Mr Borrows and Mr Spiller) asking several further questions about the draft report and, in particular, asking for clarification about the impacts and benefits of medium and large releases

Signed: [redacted] Taken by: [redacted]

Barry Kevin Dennien [Justice of the ~~Peace~~/Solicitor]

from the Dams for large flood events and about the modelling that had been done as to those issues.

61. On 8 December 2010, I emailed Mr Pruss and Mr Drury (copied to Mr Spiller and Mr Borrows) seeking a response to the earlier queries I had asked.

62. On 9 December 2010, Mr Drury sent an email to me (copied to Mr Pruss, Mr Spiller and Mr Borrows), responding to the questions that had earlier been asked.

63. On 13 December 2010, at the invitation of the Water Grid Manager, Minister Robertson attended a board meeting which I also attended. To the best of my recollection, at the board meeting:

    a. the Minister was provided with a demonstration of the OCA Incident Manager[6] and the Emergency Management Room[7];

    b. the Minister was also provided with an oral briefing as to:

        i. the optimal operation of the Water Grid;

        ii. the role of the Water Grid Manager in advising on Grid Capital Expenditure from a whole-of-grid perspective;

        iii. Wivenhoe Dam's operating level for flood mitigation; and

        iv. the effectiveness of communications between the Water Grid and the Minister's office.

[6] The software that is used, in compliance with the Emergency Response Plan, to manage communications as between all Grid Participants insofar that relates to a water supply emergency.

[7] A specific room at the premises of the Water Grid Manager that is devoted to the management of emergencies and was, as at the time of the inspection, newly in operation.

Signed: [redacted]

Barry Kevin Dennien

Taken by: [redacted]

[Justice of the ~~Peace~~/Solicitor]

c. I made the majority of the oral presentation to the Minister (with some observations being made by Mr Spiller). I told the Minister that, insofar as the Wivenhoe Dam's operating level for flood mitigation was concerned:

i. Seqwater had advised that a major reduction in the capacity of the dam below Full Supply Level was not advisable at this stage;

ii. Seqwater had advised that a great deal of modelling should be undertaken before any change to the levels of Wivenhoe Dam was contemplated and that this modelling would take in the order of 6 months;

iii. Seqwater advised, without modelling, that major reductions below Full Supply Level may be required in order to lower impacts for large floods. However estimated reductions varied greatly between 250,000 megalitres (21% of capacity) to 580,000 (50% of capacity) megalitres. Seqwater also stated these benefits diminished the bigger the flood because of the ratio of water coming into the dam to the size of the flood compartment.

iv. Seqwater had advised that large releases (that is, large releases when measured both by volume and rate) would have significant impacts downstream, including the disruption or damage to bridges and inconvenience and danger for downstream residents. These impacts had to be balanced against the possible benefits, which Seqwater saw as limited because of the unpredictability of rainfall distribution during flood events;

v. Seqwater had advised that pre-emptive releases in the days or hours before a major rainfall event was not recommended because of the difficulty in predicting exactly how much rain would fall and where it would fall and the

Signed: [redacted]

Barry Kevin Dennien

Taken by: [redacted]

[Justice ~~of the Peace~~/Solicitor]

impact of releases from the dam downstream in the event that there was either a high tide or significant rainfall downstream; and

vi. Seqwater had indicated that a small reduction in the Dams of 5% would reduce the inconvenience of bridge closures and improve access for the communities in the mid Brisbane area.

64. On 24 December 2010, I wrote to the Minister, responding to his letter dated 25 October 2010, regarding the possibility of releasing from key storages in anticipation of major inflows. That advice was based upon information provided by Seqwater. The letter advised the Minister that the Water Grid Manager and the QWC had confirmed that releases of 5% of Wivenhoe and Somerset water would have negligible effects on the ability of the Water Grid Manager and the QWC to provide water security for South East Queensland. In the advice attached to the letter, the Water Grid Manager advised that Seqwater had confirmed that any impact to allow additional flood mitigation potential would require Wivenhoe Dam releases of at least 250,000 megalitres. The Minister was advised that such a release may have potential water security impacts and that a more detailed investigation was recommended, to be led by Seqwater and involving the Bureau of Meteorology, the local councils and the Water Grid Manager.

65. On 24 December 2010, I also wrote to the QWC by email requesting its approval for a letter to go to Seqwater advising that Wivenhoe and Somerset Dams' level could be reduced to 95% of their combined Full Supply Level for flood mitigation purposes. That approval was provided to me by email at approximately midday on 24 December 2010. Seqwater was advised of the same by email from me at approximately 2:32pm on 24 December 2010.

Signed: [redacted] .

Barry Kevin Dennien

Taken by: [redacted]

[Justice ~~of the Peace~~/Solicitor]

66. At 4:31pm, Mr Borrows from Seqwater queried of me (by email) whether the letter was a direction to release the water to levels below Wivenhoe, Somerset and North Pine's Full Supply Level. At 4:53pm of 24 December 2010, I responded to that by e-mail.

67. On 20 January 2011, the Minister wrote to the Chair of the Water Grid Manager enclosing a copy of a letter to Mr Phil Hennessey, the Chair of Seqwater. The Minister asked the Water Grid Manager to assist to ensure that the requests in the correspondence to Seqwater were dealt with as a matter of priority.

68. The Minister's letter to Seqwater asked it to attend to a number of tasks, including a review of the water levels of the Wivenhoe and Somerset Dams.

69. On 25 January 2011, Seqwater organised a meeting of the Chairs and Chief Executive Officers of the QWC, and the Water Grid Manager, and the Director General of DERM and other departmental staff to discuss the Minister's letter and how Seqwater would carry out the Minister's request. The Deputy Chair of the Water Grid Manager (Mr Gordon Jardine) and I attended that meeting for the Water Grid Manager. I do not now recall in detail, let alone verbatim, who said what, but the substance and effect, in upshot, was:

    a. Seqwater would carry out any requisite modelling as regards flood mitigation; and

    b. the QWC and the Water Grid Manager, respectively, would carry out any necessary modelling with respect to water security once Seqwater had established if it was permissible and appropriate to reduce the water level below Full Supply Level.

70. Following that meeting, the Water Grid Manager decided to ask for information as to the likely impact on water security from its consultant hydrologists in order to be in a

Signed: [redacted]...

Barry Kevin Dennien

Taken by: [redacted]

[Justice ~~of the Peace~~/Solicitor]

position to advise Seqwater whether any proposed releases would impact upon the ability of the Water Grid Manager to comply with its service levels as specified in the System Operating Plan. Those hydrologists were asked to use the hydrology model that is provided under licence to the Water Grid Manager by the QWC to determine whether a temporary reduction in storage[8] would impact on the ability of the Water Grid Manager to comply with the objectives and rules contained in the System Operating Plan and its ability to manage the operation of the Water Grid so as to ensure that there was adequate water supply.

71. On 31 January 2011, a meeting was convened in the Minister's board room between the Minister, the Chief Executive Officer of Seqwater, the Director General of DERM, myself and others at which Seqwater presented some preliminary modelling data.

72. On 1 February 2011, Seqwater convened another meeting between those who had met on 25 January 2011, (see paragraph 69 above) at which Seqwater at the outset gave a short update on its modelling. Then, the Director General of DERM requested Gordon Jardine, the QWC representatives and me to leave the meeting, which, I understand, then continued.

73. On 4 February 2011, I attended a meeting with Seqwater and others. At that meeting, Seqwater tabled a letter dated 4 February 2011 to the Minister responding to his correspondence dated 20 January 2011 and spoke to the contents of that letter. I was provided with a copy.

74. I am conscious that in a submission to this Commission on 4 April 2011, it was said that the Minister attended that meeting. I gave the instruction for that statement to the best of my recollection. I have had better opportunity since then to ascertain dates and I

[8] It is important to note that these models do not deal with the likely impacts of flood waters or the impacts of the releases from the Dams, only the ability to supply water to SEQ from the Water Grid.

Signed: [redacted]..... Taken by: [redacted]

Barry Kevin Dennien [Justice of the Peace/Solicitor]

was incorrect about the Minister's attendance on 4 February 2011. The Minister attended the 31 January 2011 meeting (paragraph 71) as I have said here.

75. The modelling of a temporary reduction of the water stored in Wivenhoe Dam until the end of the current wet season showed negligible impact in the probability of triggering a re-introduction of water restrictions over either a five or ten year time frame (known as Medium Level restrictions). That modelling showed that the probability of regional storages falling to 40% of combined capacity within five years would increase by less than 0.5%, if Wivenhoe Dam's water level was reduced to 75% of the volume of water which would be in the dam at FSL until the end of June 2011.

76. I subsequently wrote to Seqwater on 9 February 2011 formally confirming that the water levels could be temporarily decreased and advising that if a permanent reduction in the Full Supply Level of Wivenhoe Dam was being considered, that may have an impact upon the System Operating Plan's desired levels of service and that should be raised with the QWC directly.

77. Once the decision was made to release further water from Wivenhoe in February 2011 (which I understand, but do not directly know, was recommended by Seqwater and made by Minister Robertson), the Water Grid Manager's communications unit was involved in advising the public and the media of the proposed releases and I was copied into those communications.

TOPIC 17: AN ACCOUNT OF ALL BRIEFINGS PREPARED FOR THE MINISTER WITH THE RESPONSIBILITY FOR DAM OPERATIONS BY THE SOUTH EAST QUEENSLAND WATER GRID MANAGER

78. I attach, as **Annexure F** to my statement, copies of all briefings prepared for the Minister with the responsibility for dam operations by the Water Grid Manager in the

Signed: .. [redacted]

Barry Kevin Dennien

Taken by: . [redacted]

[Justice of the Peace/Solicitor]

period between September 2010 and the present. I have not been physically able to collate more than this at present given the short time within which I have had to prepare this statement. The extent of my recollection as to such briefings is contained in the documents.

TOPIC 18: AN ACCOUNT OF ALL COMMUNICATIONS I HAD OR ANY BRIEFINGS RECEIVED FROM THE FLOOD OPERATIONS CENTRE BETWEEN 1 AND 19 JANUARY 2011 (AND PROVISION OF ALL EMAILS, TEXT MESSAGES AND NOTES OF PHONE CONVERSATIONS)

79. I assume that the Flood Operations Centre referred to is that defined on page 2 of the Seqwater manual of operational procedures for flood mitigation at the Dams (and particularly revision 7 of that document dated November 2009).

80. That being the case, I did not have any direct communications with the Flood Operation Centre operated by Seqwater in the period between 1 and 19 January 2011. As discussed below, the Water Grid Manager received technical situation reports from Seqwater, which I assumed were coming from the Flood Operation Centre (but which I cannot know for certain).

TOPIC 19: AN ACCOUNT OF ALL COMMUNICATIONS WITHIN MY KNOWLEDGE, BETWEEN ANY OFFICER OF THE SOUTH EAST QUEENSLAND WATER GRID MANAGER AND THE FLOOD OPERATION CENTRE BETWEEN 1 AND 19 JANUARY 2011 (AND PROVISION OF ALL EMAILS, TEXT MESSAGES AND NOTES OF PHONE CONVERSATIONS)

81. Insofar as I am aware, the only communications between any officer of the Water Grid Manager and the Flood Operation Centre conducted by Seqwater between 1 and 19 January 2011 was the receipt of technical situation reports which the Water Grid

Signed: [redacted]
Barry Kevin Dennien

Taken by: [redacted]
[Justice of the Peace/Solicitor]

Manager received from Seqwater during that period. I assumed those were coming from the Flood Operation Centre (which I cannot know for certain).

82. All the facts and circumstances deposed to herein are within my own knowledge, save such as are deposed to from information only, and my means of knowledge and sources of knowledge appear in this my statement to the Commission.

Sworn by Barry Kevin Dennien on 5 April 2011 at Brisbane in the presence of:

Signed: [redacted]

Barry Kevin Dennien

Taken by: [redacted]

[Justice of the Peace/Solicitor]

Constitution of Queensland 2001

ADMINISTRATIVE ARRANGEMENTS ORDER (No. 1) 2010

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Short Title

1. This order in council may be cited as the *Administrative Arrangements Order (No.1) 2010.*

Administrative Arrangements

2. **(1)** The public business of the State is distributed among Ministers as set out in the Schedule.

(2) Each Minister is to administer the matters set out in the Schedule next to the Minister's title as follows:

(a) the matters connected with the public business of the State listed under the heading '*Principal Ministerial Responsibilities*';

(b) the legislation listed under the heading '*Acts Administered*'; and

(c) the administrative units listed under the heading '*Administrative Units*'.

(3) Information in the Schedule under the heading '*Responsible Heads*' is included for information only and does not form part of this order.

Repeal of earlier Administrative Arrangements

3. The *Administrative Arrangements Order (No. 2) 2009* is repealed.

Commencement

4. This order takes effect from 1 July 2010.

ENDNOTES

1. Made by the Governor in Council on 1 July 2010.
2. Published in the Government Gazette on 2 July 2010.
3. The administering agency is the Department of the Premier and Cabinet.

SCHEDULE

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
Premier and Minister for the Arts	Administrative Reform Assistance to Cabinet and its Committees Co-ordination of Government Administration Co-ordination of Policy Development Government Air Wing Legislative Drafting	Assisted Students (Enforcement of Obligations) Act 1951 Auditor-General Act 2009 Australian Constitutions Act 1842 (Imperial) Australian Constitutions Act 1844 (Imperial) Australian Waste Lands Act 1855 (Imperial) Century Zinc Project Act 1997 (ss1-4, 5(1), 8, 18-20) Commonwealth Powers (Air Transport) Act 1950 Constitution Act 1867 Constitution Act Amendment Act 1890 Constitution Act Amendment Act 1934 Constitution of Queensland 2001 Constitutional Powers (Coastal Waters) Act 1980 Emblems of Queensland Act 2005 Governors (Salary and Pensions) Act 2003 Integrity Act 2009 Legislative Standards Act 1992 Off-shore Facilities Act 1986 Parliament of Queensland Act 2001 Parliamentary Service Act 1988 Queensland Boundaries Declaratory Act 1982 Queensland Coast Islands Act 1879 Queensland Competition Authority Act 1997 (jointly administered with the Treasurer and Minister for Employment and Economic Development) Queensland International Tourist Centre Agreement Act Repeal Act 1989 Reprints Act 1992 Senate Elections Act 1960 South Bank Corporation Act 1989 Statute of Westminster 1931 (Imperial) Statute of Westminster Adoption Act 1942 (Cwlth) Statutory Instruments Act 1992	Department of the Premier and Cabinet	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
	Arts	Libraries Act 1988 Queensland Art Gallery Act 1987 Queensland Museum Act 1970 Queensland Performing Arts Trust Act 1977 Queensland Theatre Company Act 1970 Schools of Arts (Winding Up and Transfer) Act 1960 Schools of Arts (Winding Up and Transfer) Act Amendment Act 1981		
	Overall public service management and employment conditions to ensure the development of a highly professional public service in the areas of capability and performance, public service reform and governance.	Public Sector Ethics Act 1994 Public Service Act 2008 Whistleblowers Protection Act 1994	Public Service Commission	Commission Chief Executive

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
Deputy Premier and Minister for Health	Aboriginal and Torres Strait Islander Health Alcohol and Drug Services Community Health Services Disease Surveillance Health Care for Special Needs Groups Health Promotion Health Rights Hospitals Mental Health Nursing Homes and Hostels Offender Health Services of Prisoners Oral Health Public Health Registration of Health Professionals	Dental Technicians Registration Act 2001 Food Act 2006 Health Act 1937 Health Practitioner Registration Boards (Administration) Act 1999 Health Practitioner Regulation National Law Act 2009 Health Practitioners (Professional Standards) Act 1999 Health Practitioners (Special Events Exemption) Act 1998 Health Quality and Complaints Commission Act 2006 Health Services Act 1991 (jointly administered with the Minister for Disability Services and Multicultural Affairs) Hospitals Foundations Act 1982 Mater Public Health Services Act 2008 Medical Radiation Technologists Registration Act 2001 Mental Health Act 2000 Occupational Therapists Registration Act 2001 Pest Management Act 2001 Pharmacists Registration Act 2001 Private Health Facilities Act 1999 Public Health Act 2005 Public Health (Infection Control for Personal Appearance Services) Act 2003 Queensland Institute of Medical Research Act 1945 Radiation Safety Act 1999 Research Involving Human Embryos and Prohibition of Human Cloning for Reproduction Act 2003 Speech Pathologists Registration Act 2001 Tobacco and Other Smoking Products Act 1998 Transplantation and Anatomy Act 1979 Water Fluoridation Act 2008	Department of Health	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
Treasurer and Minister for Employment and Economic Development	Capital Works Monitoring Community Investment Fund Financial and Economic Policy Government Owned Enterprises Government Statistics Government Superannuation Insurance Nominal Defendant Public Sector Financial Policy State Actuary State Budget State Taxation (Administration) State Taxation (Policy)	Advance Bank Integration Act 1997 Airport Assets (Restructuring and Disposal) Act 2008 Anzac Square Development Project Act 1982 Appropriation Act 2007 Appropriation Act 2008 Appropriation Act 2009 Appropriation Act (No. 2) 2008 Appropriation (Parliament) Act 2007 Appropriation (Parliament) Act 2008 Appropriation (Parliament Act 2009 Appropriation (Parliament) Act (No. 2) 2008 Bank Integration (Bank of Queensland) Act 1993 Bank Merger (Bank SA and Advance Bank) Act 1996 Bank of New Zealand (Transfer of Undertaking) Act 1997 Brisbane Markets Act 2002 Brisbane Trades Hall Management Act 1984 Central Queensland Coal Associates Agreement Act 1968 (Sch pt V) Challenge Bank (Transfer of Undertaking) Act 1996 Commonwealth and State Statistical Agreement Act 1958 Commonwealth Places (Mirror Taxes Administration) Act 1999 Commonwealth Savings Bank of Australia Agreement Act 1966 Community Ambulance Cover Act 2003 Competition Policy Reform (Queensland) Act 1996 Dalrymple Bay Coal Terminal (Long-Term Lease) Act 2001 Debits Tax Repeal Act 2005 Duties Act 2001 Energy Assets (Restructuring and Disposal) Act 2006 Family Security Friendly Society (Distribution of Moneys) Act 1991	Treasury Department	Under Treasurer

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Financial Accountability Act 2009 Financial Agreement Act 1994 Financial Intermediaries Act 1996 Financial Sector Reform (Queensland) Act 1999 First Home Owner Grant Act 2000 Fuel Subsidy Repeal Act 2009 Future Growth Fund Act 2006 Gaming Machine Act 1991 (ss 314(1), 314(3), 322(5)) Government Inscribed Stock Act 1920 Government Loan Act 1986 Government Loans Redemption and Conversion Act 1923 Government Owned Corporations Act 1993 Government Stock Act 1912 GST and Related Matters Act 2000 Infrastructure Investment (Asset Restructuring and Disposal) Act 2009 Judges (Pensions and Long Leave) Act 1957 (s17) Land Tax Act 2010 Liquor Act 1992 (s219(2), 219(3) and 220 (3)) Motor Accident Insurance Act 1994 Mutual Recognition (Queensland) Act 1992 New Tax System Price Exploitation Code (Queensland) Act 1999 Pay-roll Tax Act 1971 Public Officers' Superannuation Benefits Recovery Act 1988 Queensland Competition Authority Act 1997 (jointly administered with the Premier and Minister for the Arts) Queensland Investment Corporation Act 1991 Queensland Nickel Agreement Act 1970 (all financial and related matters) Queensland Treasury Corporation Act 1988		

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		South East Queensland Water (Restructuring) Act 2007 (including as a Responsible Minister for the purposes of Chapter 2 of this Act)	Queensland Bulk Water Supply Authority	Chief Executive Officer
			Queensland Bulk Water Transport Authority	Chief Executive Officer
			Queensland Manufactured Water Authority	Chief Executive Officer
			SEQ Water Grid Manager	Chief Executive Officer
		State Bank of South Australia (Transfer of Undertaking) Act 1994 State Financial Institutions and Metway Merger Facilitation Act 1996 Statistical Returns Act 1896 Statutory Authorities (Superannuation Arrangements) Act 1994 Statutory Bodies Financial Arrangements Act 1982 Superannuation (Public Employees Portability) Act 1985 Superannuation (State Public Sector) Act 1990 Taxation Administration Act 2001 Tobacco Products (Licensing) Act 1988 Trans-Tasman Mutual Recognition (Queensland) Act 2003		
	Administration of Crown Copyright and Intellectual Property Economic Development including: • Industry Development • Business Development	Biodiscovery Act 2004 Gene Technology Act 2001	Department of Employment, Economic Development and Innovation	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
	• Investment Opportunities and Attraction • Regional Economic Development • Research and Development Co-ordination and Planning Employment Promotion and Protection Employment Policies and Programs Innovation International Collaborations			
	Commercial Plantation Forestry Custody and Management of State Plantation Forests	Forestry Act 1959 (to the extent that it is relevant to State Plantation Forests) Forestry Plantations Queensland Act 2006 (jointly administered with the Minister for Primary Industries, Fisheries and Rural and Regional Queensland)	Forestry Plantations Queensland Forestry Plantations Queensland Office	Chief Plantation Forestry Officer Chief Executive Officer
	Regional Planning for the Wide Bay Burnett Region	Sustainable Planning Act 2009 (Chapter 2, Parts 2 and 3 and Chapter 4 for the Wide Bay Burnett Region)	Department of Infrastructure and Planning	Director - General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
Minister for Public Works and Information and Communication Technology	Archives Government Accommodation and Public Service Residences Government Buildings including— • Design, Construction and Maintenance • Project Management • Protective Services Government Communication and Information Services Government Information Planning Government Motor Vehicles Government Printing and Publishing Government Purchasing (including electronic procurement) Licensing and regulation of the Queensland building industry Queensland home warranty insurance scheme Professional Practices and Registration of Professional Engineers and Architects Property Facilities Management and Property Related Services for Government Smart Service Queensland Shared Services Provision (other than Queensland Health, the Department of Education and Training, and that part of the Department of the Premier and Cabinet that services Arts Queensland) and Shared Services Systems Urban Design and Government Architect Warehousing and Distribution of General Merchandise and Furniture	Architects Act 2002 Building and Construction Industry Payments Act 2004 Domestic Building Contracts Act 2000 Professional Engineers Act 2002 Public Records Act 2002 Queensland Building Services Authority Act 1991 State Buildings Protective Security Act 1983 Subcontractors' Charges Act 1974	Department of Public Works	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
Minister for Natural Resources, Mines and Energy and Minister for Trade	Aboriginal and Torres Strait Islander matters including— • Land Interests • Land Titles • Aboriginal and Torres Strait Islander Cultural Heritage Commercial Forestry for native forest under the Forestry Act 1959 Commercial Water Services Land including— • Allocation, Management and Use of State Land • Compulsory Acquisition • Information • Land Protection • Land Titles • Surveying and Mapping • Valuations Native Title (excluding for mining, petroleum and geothermal) Natural Resource Management including— • Catchment Management • Water Resource Management excluding— • Land Conservation • Native Forest Management Place Names Quarry Sales under the Forestry Act 1959 Selling allocation of State quarry material under the Water Act 2000 Registration of Valuers and Surveyors Water Recycling Strategy	Aboriginal Cultural Heritage Act 2003 Aboriginal Land Act 1991 (except to the extent administered by the Attorney-General and Minister for Industrial Relations and the Minister for Climate Change and Sustainability); (sections 83G and 83H, jointly administered with the Minister for Climate Change and Sustainability); and (except Part 7) Aborigines and Torres Strait Islanders (Land Holding) Act 1985 Acquisition of Land Act 1967 Allan and Stark Burnett Lane Subway Authorisation Act 1926 Building Units and Group Titles Act 1980 (except to the extent administered by the Minister for Tourism and Fair Trading; sections 5, 5A, 119, 133 and 134 jointly administered with the Minister for Tourism and Fair Trading) Cape York Peninsula Heritage Act 2007 (Parts 3, 4, Part 6 ss25-27) (Parts 1,5, 6 ss28-29 jointly administered with the Minister for Climate Change and Sustainability) Century Zinc Project Act 1997 (s 9) Foreign Governments (Titles to Land) Act 1948 Foreign Ownership of Land Register Act 1988 Forestry Act 1959 (jointly administered with the Minister for Climate Change and Sustainability; except to the extent administered by the Treasurer and Minister for Employment and Economic Development and the Minister for Primary Industries, Fisheries and Rural and Regional Queensland) Ipswich Trades Hall Act 1986 Lake Eyre Basin Agreement Act 2001 Land Act 1994 (except ss 452A(2) and (3))	Department of Environment and Resource Management	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*

Land Protection (Pest and Stock Route Management) Act 2002 (to the extent that it is relevant to Stock Route Management) (jointly administered with the Minister for Primary Industries, Fisheries and Rural and Regional Queensland)
Land Title Act 1994
Metropolitan Water Supply and Sewerage Act 1909
Native Title (Queensland) Act 1993
New South Wales - Queensland Border Rivers Act 1946
Place Names Act 1994
Registration of Plans (H.S.P. (Nominees) Pty. Limited) Enabling Act 1980
Registration of Plans (Stage 2) (H.S.P. (Nominees) Pty. Limited) Enabling Act 1984
River Improvement Trust Act 1940
Soil Conservation Act 1986
Soil Survey Act 1929
Starcke Pastoral Holdings Acquisition Act 1994
Survey and Mapping Infrastructure Act 2003
Surveyors Act 2003
Torres Strait Islander Cultural Heritage Act 2003
Torres Strait Islander Land Act 1991 (except to the extent administered by the Attorney-General and Minister for Industrial Relations and the Minister for Climate Change and Sustainability); and (except Part 7)
Valuation of Land Act 1944
Valuers Registration Act 1992
Vegetation Management Act 1999
Water Act 2000 (except to the extent administered by the Minister for Natural Resources, Mines and Energy and Minister for Trade through the Queensland Water Commission)
Water (Commonwealth Powers) Act 2008
Water Efficiency Labelling and Standards Act 2005
Water Supply (Safety and Reliability) Act 2008
Wild Rivers Act 2005
Yeppoon Hospital Site Acquisition Act 2006

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Water Act 2000 (Chapter 2A, Part 1, Part 2 Divisions 1, 2, 4, 5 and 7, Part 3 Divisions 1 and 2, Part 4, Part 5, Part 5A and Part 6)	Queensland Water Commission	Commissioner
		South East Queensland Water (Distribution and Retail Restructuring) Act 2009		
		South East Queensland Water (Restructuring) Act 2007 (in so far as the Minister is a Responsible Minister for the purpose of Chapter 2 of this Act)	Queensland Bulk Water Supply Authority	Chief Executive Officer
			Queensland Bulk Water Transport Authority	Chief Executive Officer
			Queensland Manufactured Water Authority	Chief Executive Officer
			SEQ Water Grid Manager	Chief Executive Officer
	Access to Natural Gas Pipelines, Distribution and Retail of Reticulated Fuel Gas, and Sufficiency of Supply of Fuel Gas and Liquid Fuel Electricity Energy Explosives Gas Safety and Health Geological Survey Geothermal Energy Geothermal Safety and Health Geothermal Titles	Aboriginal Land Act 1991 (Part 7) Alcan Queensland Pty. Limited Agreement Act 1965 (Sch – except to the extent administered by the Minister for Climate Change and Sustainability) Central Queensland Coal Associates Agreement Act 1968 (Sch pt III – except to the extent administered by the Minister for Climate Change and Sustainability) Century Zinc Project Act 1997 (s 10) Clean Coal Technology Special Agreement Act 2007 Clean Energy Act 2008	Department of Employment, Economic Development and Innovation	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
	Mineral Resources impacts on Aboriginal and Torres Strait Islander interests Minerals Mining Safety and Health Mining Titles Native Title (relating to mining, petroleum and geothermal) Petroleum Safety and Health Petroleum Titles Pipeline Licences Royalties	Coal and Oil Shale Mine Workers' Superannuation Act 1989 Coal Mining Safety and Health Act 1999 Commonwealth Aluminium Corporation Pty. Limited Agreement Act 1957 (except to the extent administered by the Minister for Climate Change and Sustainability) Electricity Act 1994 Electricity-National Scheme (Queensland) Act 1997 Energy Ombudsman Act 2006 Explosives Act 1999 Fossicking Act 1994 Gas Supply Act 2003 Geothermal Exploration Act 2004 Gladstone Power Station Agreement Act 1993 Greenhouse Gas Storage Act 2009 Land Act 1994 (ss 452A (2) and (3)) Liquid Fuel Supply Act 1984 Mineral Resources Act 1989 (except to the extent administered by the Minister for Climate Change and Sustainability) Mining and Quarrying Safety and Health Act 1999 Mount Isa Mines Limited Agreement Act 1985 (except to the extent administered by the Minister for Climate Change and Sustainability) National Gas (Queensland) Act 2008 Nuclear Facilities Prohibition Act 2007 Offshore Minerals Act 1998 Petroleum Act 1923 Petroleum and Gas (Production and Safety) Act 2004 Petroleum (Submerged Lands) Act 1982 Queensland Nickel Agreement Act 1970 (Sch pts II-III, VI and VII) Thiess Peabody Coal Pty. Ltd. Agreement Act 1962 (except to the extent administered by the Minister for Climate Change and Sustainability)		

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Thiess Peabody Mitsui Coal Pty. Ltd. Agreements Act 1965 (except to the extent administered by the Minister for Climate Change and Sustainability) Torres Strait Islander Land Act 1991 (Part 7)		
	Trade Development	Agent-General for Queensland Act 1975		
Minister for Education and Training	Early Childhood Education and Care Education including— • Aboriginal and Torres Strait Islander Education • Continuing Education • Distance Education • Education of Students of Non-English Speaking Background • Education of Students in Youth Detention Centres • Preschool Education • Primary Education • Secondary Education • Special Education Higher Education including— • State Government Policy and Planning Kindergarten Funding Non-State School Funding Registration of Teachers Smart State Education Initiatives	Australian Catholic University (Queensland) Act 2007 Bond University Act 1987 Child Care Act 2002 Central Queensland University Act 1998 Community Services Act 2007 (Parts 1 to 9, 11 to 13 and Schedules 1 to 4) (jointly administered with the Minister for Local Government and Aboriginal and Torres Strait Islander Partnerships, Minister for Community Services and Housing and Minister for Women, Minister for Disability Services and Multicultural Affairs) Education (Accreditation of Non-State Schools) Act 2001 Education (Capital Assistance) Act 1993 Education (General Provisions) Act 2006 Education (Overseas Students) Act 1996 Education (Queensland College of Teachers) Act 2005 Education (Queensland Studies Authority) Act 2002 Education (Work Experience) Act 1996 Grammar Schools Act 1975 Griffith University Act 1998 Higher Education (General Provisions) Act 2008 James Cook University Act 1997 Queensland University of Technology Act 1998 University of Queensland Act 1998 University of Southern Queensland Act 1998 University of the Sunshine Coast Act 1998	Department of Education and Training	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
	Vocational Education and Training including Technical and Further Education	Vocational Education, Training and Employment Act 2000		
Minister for Police, Corrective Services and Emergency Services	Police Services	Australian Crime Commission (Queensland) Act 2003 Child Protection (Offender Prohibition Order) Act 2008 Child Protection (Offender Reporting) Act 2004 Police Powers and Responsibilities Act 2000 Police Service Administration Act 1990 Prostitution Act 1999 Public Safety Preservation Act 1986 Queensland Police Welfare Club Act 1970 Summary Offences Act 2005 Terrorism (Preventative Detention) Act 2005 Weapons Act 1990	Department of Police	Commissioner of the Police Service
	Adult Corrective Services (excluding offender health services)	Corrective Services Act 2006 Parole Orders (Transfer) Act 1984	Department of Community Safety	Director-General
	Ambulance Service Disaster Management and State Emergency Service Emergency Helicopter Services Fire Service	Ambulance Service Act 1991 Disaster Management Act 2003 Fire and Rescue Service Act 1990		

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
Minister for Main Roads	Busways Roads	Transport Infrastructure Act 1994 (jointly administered with the Minister for Transport) Transport Planning and Coordination Act 1994(jointly administered with the Minister for Transport)	Department of Transport and Main Roads	Director-General
Minister for Primary Industries, Fisheries and Rural and Regional Queensland	Agricultural Chemicals Agricultural Colleges Animal Welfare Biosecurity Fisheries Resource Management Food and Fibre Production Food Processing and Value Adding Development Forestry Industry Development Plant and Animal Diseases Primary Industry Research, Development and Extension Private Forestry Regional Communities Rural Communities	Agricultural and Veterinary Chemicals (Queensland) Act 1994 Agricultural Chemicals Distribution Control Act 1966 Agricultural College Act 2005 Agricultural Standards Act 1994 Animal Care and Protection Act 2001 Apiaries Act 1982 Biological Control Act 1987 Brands Act 1915 Chemical Usage (Agricultural and Veterinary) Control Act 1988 Chicken Meat Industry Committee Act 1976 Diseases in Timber Act 1975 Drugs Misuse Act 1986 (Part 5B) Exotic Diseases in Animals Act 1981 Fisheries Act 1994 Food Production (Safety) Act 2000 Land Protection (Pest and Stock Route Management) Act 2002 (except to the extent that it is relevant to Stock Route Management) (jointly administered with the Minister for Natural Resources, Mines and Energy and Minister for Trade) Nature Conservation Act 1992 (to the extent that it is relevant to demonstrated and exhibited native animals) (jointly administered by the Minister for Climate Change and Sustainability)	Department of Employment, Economic Development and Innovation	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Plant Protection Act 1989 Rural and Regional Adjustment Act 1994 Stock Act 1915 Sugar Industry Act 1999 Timber Utilisation and Marketing Act 1987 Torres Strait Fisheries Act 1984 Veterinary Surgeons Act 1936		
	Commercial Plantation Forestry Custody and Management of State Plantation Forests	Forestry Act 1959 (to the extent that it is relevant to State Plantation Forests)	Forestry Plantations Queensland	Chief Plantation Forestry Officer
		Forestry Plantations Queensland Act 2006 (jointly administered with the Treasurer and Minister for Employment and Economic Development)	Forestry Plantations Queensland Office	Chief Executive Officer

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
Minister for Local Government and Aboriginal and Torres Strait Islander Partnerships	Aboriginal and Torres Strait Islander Infrastructure Local Government, including Aboriginal and Island Councils	Aboriginal and Torres Strait Islander Communities (Justice, Land and Other Matters) Act 1984 (Part 9, Div 2 and Part 10) Animal Management (Cats and Dogs) Act 2008 City of Brisbane Act 2010 Central Queensland Coal Associates Agreement Act 1968 (Sch pt VI) Century Zinc Project Act 1997 (ss14-17) Family Services Act 1987 (Part 3) (jointly administered with the Minister for Child Safety and Minister for Sport) Local Government (Aboriginal Lands) Act 1978 Local Government Act 2009	Department of Infrastructure and Planning	Director-General
	Aboriginal and Torres Strait Islander Policy Aboriginal and Torres Strait Islander Rights and Culture	Aboriginal and Torres Strait Islander Communities (Justice, Land and Other Matters) Act 1984 (except to the extent administered by the Attorney-General and Minister for Industrial Relations); (sections 4, 8, 64-67, 70 and 71, jointly administered with the Attorney-General and Minister for Industrial Relations) Community Services Act 2007 (jointly administered with the Minister for Community Services and Housing and Minister for Women and the Minister for Disability Services and Multicultural Affairs) (Parts 1 to 9, 11 to 13 and Schedules 1 to 4 jointly administered with the Minister for Education and Training) Family Responsibilities Commission Act 2008	Department of Communities	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
Minister for Infrastructure and Planning	Building and Plumbing Standards Industrial Development Infrastructure Co-ordination and Planning Land Use Planning Licensing of Plumbers and Drainers Major Development Project Facilitation Urban Growth	Alcan Queensland Pty. Limited Agreement Act 1965 (except to the extent administered by the Minister for Natural Resources, Mines and Energy and Minister for Trade and the Minister for Climate Change and Sustainability) Amoco Australia Pty. Limited Agreement Act 1961 Ampol Refineries Limited Agreement Act 1964 Austral-Pacific Fertilizers Limited Agreement Act 1967 Building Act 1975 Central Queensland Coal Associates Agreement Act 1968 (except to the extent administered by the Treasurer and Minister for Employment and Economic Development; the Minister for Transport, the Minister for Natural Resources, Mines and Energy and Minister for Trade, and the Minister for Climate Change and Sustainability) Central Queensland Coal Associates Agreement (Amendment) Act 1986 (except to the extent administered by the Minister for Climate Change and Sustainability) Central Queensland Coal Associates Agreement Amendment Act 1989 (except to the extent administered by the Minister for Climate Change and Sustainability) Central Queensland Coal Associates Agreement and Queensland Coal Trust Act 1984(except to the extent administered by the Minister for Climate Change and Sustainability) Central Queensland Coal Associates Agreement Variation Act 1996 Iconic Queensland Places Act 2008 Industrial Development Act 1963 Integrated Resort Development Act 1987 Local Government (Robina Central Planning Agreement) Act 1992	Department of Infrastructure and Planning	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Mixed Use Development Act 1993 Planning (Urban Encroachment - Milton Brewery) Act 2009 Plumbing and Drainage Act 2002 Queensland Nickel Agreement Act 1970 (except to the extent administered by the Treasurer and Minister for Employment and Economic Development; the Minister for Transport,; and the Minister for Natural Resources, Mines and Energy and Minister for Trade, and the Minister for Climate Change and Sustainability Queensland Nickel Agreement Act 1988 (except to the extent administered by the Minister for Climate Change and Sustainability) Royal National Agricultural and Industrial Association of Queensland Act 1971 Sanctuary Cove Resort Act 1985 Southern Moreton Bay Islands Development Entitlements Protection Act 2004 State Development and Public Works Organisation Act 1971 Sustainable Planning Act 2009 (except to the extent administered by the Treasurer and Minister for Employment and Economic Development) Townsville Breakwater Entertainment Centre Act 1991 Townsville City Council (Douglas Land Development) Act 1993 Townsville Zinc Refinery Act 1996 Urban Land Development Authority Act 2007		

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
Minister for Transport	Air Services Busways Land Transport and Safety Maritime Passenger Transport Railways Transport Infrastructure	Adult Proof of Age Card Act 2008 Air Navigation Act 1937 Australian Shipping Commission Authorization Act 1977 Brisbane River Tidal Lands Improvement Act 1927 Central Queensland Coal Associates Agreement Act 1968 (Sch pts IV-IVC) Century Zinc Project Act 1997 (ss 5(2)-(7), 11, 12, 13, 21) Civil Aviation (Carriers' Liability) Act 1964 Maritime Safety Queensland Act 2002 Queensland Nickel Agreement Act 1970 (Sch pts IV-V) State Transport Act 1938 State Transport (People Movers) Act 1989 Thiess Peabody Mitsui Coal Pty. Ltd. Agreements Act 1965 Tow Truck Act 1973 Transport Infrastructure Act 1994 (jointly administered with the Minister for Main Roads) Transport Operations (Marine Pollution) Act 1995 Transport Operations (Marine Safety) Act 1994 Transport Operations (Passenger Transport) Act 1994 Transport Operations (TransLink Transit Authority) Act 2008 Transport Operations (Road Use Management) Act 1995 Transport Planning and Coordination Act 1994 (jointly administered with the Minister for Main Roads) Transport (South Bank Corporation Area Land) Act 1999 Transport Security (Counter-Terrorism) Act 2008	Department of Transport and Main Roads	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
Minister for Tourism and Fair Trading	Tourism	Tourism Queensland Act 1979 Traveller Accommodation Providers (Liability) Act 2001	Department of Employment, Economic Development and Innovation	Director-General
	Business Names Charities Community Services including— • Regulation of Retirement Villages Consumer Affairs Consumer Credit Incorporated Associations Occupational licensing • Auctioneers and Real Estate Agents • Commercial Agents • Motor Dealers • Travel Agents Profiteering Prevention Security Providers Supervision of Commercial Acts Trade Measurement	All Saints Church Lands Act 1924 All Saints Church Lands Act 1960 Anglican Church of Australia Act 1895 Anglican Church of Australia Act 1895 Amendment Act 1901 Anglican Church of Australia Act 1977 Anglican Church of Australia Constitution Act 1961 Anglican Church of Australia (Diocese of Brisbane) Property Act 1889 Ann Street Presbyterian Church Act 1889 Associations Incorporation Act 1981 Bills of Sale and Other Instruments Act 1955 Bishopsbourne Estate and See Endowment Trusts Act 1898 Body Corporate and Community Management Act 1997 (except to the extent administered by the Attorney-General and Minister for Industrial Relations (ss 320, 322, 341 and Schedule 6 jointly administered with the Attorney-General and Minister for Industrial Relations) Boonah Show Ground Act 1914 Building Units and Group Titles Act 1980 (Parts 4 and 5; sections 121 to 125; sections 127 to 132; Schedules 2, 3 and 4; sections 5, 5A, 119, 133 and 134 jointly administered with the Minister for Natural Resources, Mines and Energy and Minister for Trade) Business Names Act 1962 Charitable Funds Act 1958 Chinese Temple Society Act 1964 Churches of Christ, Scientist, Incorporation Act 1964 Collections Act 1966		

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Cooperatives Act 1997 Credit (Commonwealth Powers) Act 2010 Credit (Rural Finance) Act 1996 Disposal of Uncollected Goods Act 1967 Factors Act 1892 Fair Trading Act 1989 Funeral Benefit Business Act 1982 Guides Queensland Act 1970 Introduction Agents Act 2001 Land Sales Act 1984 Liens on Crops of Sugar Cane Act 1931 Manufactured Homes (Residential Parks) Act 2003 Mercantile Act 1867 Motor Vehicles and Boats Securities Act 1986 Partnership Act 1891 Personal Property Securities (Commonwealth Powers) Act 2009 Presbyterian Church of Australia Act 1900 Presbyterian Church of Australia Act 1971 Property Agents and Motor Dealers Act 2000 Queensland Congregational Union Act 1967 Queensland Temperance League Lands Act 1985 Residential Services (Accreditation) Act 2002 Retirement Villages Act 1999 Returned & Services League of Australia (Queensland Branch) Act 1956 Returned Servicemen's Badges Act 1956 Roman Catholic Church (Corporation of the Sisters of Mercy of the Diocese of Cairns) Lands Vesting Act 1945 Roman Catholic Church (Incorporation of Church Entities) Act 1994 Roman Catholic Church Lands Act 1985 Roman Catholic Church (Northern Lands) Vesting Act 1941 Roman Catholic Relief Act 1830 Sale of Goods Act 1896		

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Sale of Goods (Vienna Convention) Act 1986 Salvation Army (Queensland) Property Trust Act 1930 Scout Association of Australia Queensland Branch Act 1975 Sea-Carriage Documents Act 1996 Second-hand Dealers and Pawnbrokers Act 2003 Security Providers Act 1993 Storage Liens Act 1973 Tourism Services Act 2003 Trade Measurement Legislation Repeal Act 2009 Travel Agents Act 1988 United Grand Lodge of Antient Free and Accepted Masons of Queensland Trustees Act 1942 Uniting Church in Australia Act 1977 Wesleyan Methodist Trust Property Act 1853 Wesleyan Methodists, Independents, and Baptists Churches Act 1838		
	Art Unions Casinos Golden Casket Liquor Licensing Machine Gaming	Breakwater Island Casino Agreement Act 1984 Brisbane Casino Agreement Act 1992 Cairns Casino Agreement Act 1993 Casino Control Act 1982 Charitable and Non-Profit Gaming Act 1999 Gaming Machine Act 1991 (except to the extent administered by the Treasurer and Minister for Employment and Economic Development) Interactive Gambling (Player Protection) Act 1998 Jupiters Casino Agreement Act 1983 Keno Act 1996 Liquor Act 1992 (except to the extent administered by the Treasurer and Minister for Employment, Economic Development) Lotteries Act 1997 TAB Queensland Limited Privatisation Act 1999 Wagering Act 1998 Wine Industry Act 1994		

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
	Racing	Eagle Farm Racecourse Act 1998 Racing Act 2002 Racing Venues Development Act 1982		
Minister for Child Safety and Minister for Sport	Child Protection Services	Adoption Act 2009 (except to the extent administered by the Attorney-General and Minister for Industrial Relations) Childrens Court Act 1992 (ss 20(1)(f), 20(2)(a)(ii))(jointly administered with the Minister for Community Services and Housing and Minister for Women,) Child Protection Act 1999 (except to the extent administered by the Attorney-General and Minister for Industrial Relations) Child Protection (International Measures) Act 2003 Family Services Act 1987 (Parts 1, 2 and 5 jointly administered with the Minister for Community Services and Housing and Minister for Women) (Part 3 jointly administered with the Minister for Local Government and Aboriginal and Torres Strait Islander Partnerships)	Department of Communities	Director-General
	Motor Racing Events Recreation excluding Natural Resource Recreation and Education Sport	Motor Racing Events Act 1990 Major Sports Facilities Act 2001 Mt. Gravatt Showgrounds Act 1988 Sports Anti-Doping Act 2003		
Minister for Community Services and Housing and Minister for	Women's Policy Community Services Homelessness Seniors	Childrens Court Act 1992 (ss 20(1)(f), 20(2)(a)(ii))(jointly administered with the Minister for Child Safety and Minister for Sport)	Department of Communities	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
Women	Social Inclusion Youth Affairs Youth Justice Youth Support and Prevention Programs and Centres	Commission for Children and Young People and Child Guardian Act 2000 Community Services Act 2007 (jointly administered with the Minister for Local Government and Aboriginal and Torres Strait Islander Partnerships and the Minister for Disability Services and Multicultural Affairs) (Parts 1 to 9, 11 to 13 and Schedules 1 to 4 jointly administered with the Minister for Education and Training) Domestic and Family Violence Protection Act 1989 Family Services Act 1987 (Parts 1, 2 and 5 jointly administered with the Minister for Child Safety and Minister for Sport) (Part 3 jointly administered with the Minister for Local Government and Aboriginal and Torres Strait Islander Partnerships and the Minister for Child Safety and Minister for Sport) Juvenile Justice Act 1992 Young Offenders (Interstate Transfer) Act 1987		
	Housing Services including— • Aboriginal and Torres Strait Islander Housing • Community Housing • Home Ownership Private Housing Assistance Public Housing Housing Policy	Housing Act 2003 Housing (Freeholding of Land) Act 1957 Inala Shopping Centre Freeholding Act 2006 Residential Tenancies and Rooming Accommodation Act 2008		
Minister for Disability Services and Multicultural Affairs	Disability Services Home and Community Care Multicultural Affairs	Carers (Recognition) Act 2008 Community Services Act 2007 (jointly administered with the Minister for Local Government and Aboriginal and Torres Strait Islander Partnerships and Minister for Community Services and Housing and Minister for Women) (Parts 1 to 9, 11 to 13 and Schedules 1 to	Department of Communities	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		4 jointly administered with the Minister for Education and Training) Disability Services Act 2006 Guide, Hearing and Assistance Dogs Act 2009 Health Services Act 1991 (jointly administered with the Minister for Health)		
Minister for Climate Change and Sustainability	Aboriginal and Torres Strait Islander Cultural Land Interests Climate Change Policy and Science Coastal Management Contaminated Land Custody and Management of State Forests other than State Plantation Forests Ecologically Sustainable Development Environment including Management of Mining, including mines operating under special agreement acts Environmental Planning Historical Cultural Heritage Land Conservation Marine Parks Management Native Forest Management Nature Conservation Pollution Management Waste Management Wet Tropics Management	Aboriginal Land Act 1991 (s 132A(2)-(11); s 134 (as it applies to the provisions of the Act administered by the Minister); (sections 83G and 83H jointly administered with the Minister for Natural Resources, Mines and Energy and Minister for Trade)) Alcan Queensland Pty. Limited Agreement Act 1965 (Sch –to the extent that it is relevant to environmental matters) Brisbane Forest Park Act 1977 Cape York Peninsula Heritage Act 2007 (Part 2, Part 6 s24) (Parts 1, 5, 6ss28-29 and Part 7 jointly administered with the Minister for Natural Resources, Mines and Energy and Minister for Trade) Central Queensland Coal Associates Agreement Act 1968 (Sch 1 pt III – to the extent that it is relevant to environmental matters) Central Queensland Coal Associates Agreement (Amendment) Act 1986 (to the extent that is it relevant to environmental matters) Central Queensland Coal Associates Agreement Amendment Act 1989 (to the extent that it is relevant to environmental matters)	Department of Environment and Resource Management	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Central Queensland Coal Associates Agreement and Queensland Coal Trust Act 1984 (to the extent that it is relevant to environmental matters) Coastal Protection and Management Act 1995 Commonwealth Aluminium Corporation Pty. Limited Agreement Act 1957 (to the extent that it is relevant to environmental matters) Currumbin Bird Sanctuary Act 1976 Environmental Protection Act 1994 Forestry Act 1959 (jointly administered with the Minister for Natural Resources, Mines and Energy and Minister for Trade except to the extent administered by the Treasurer and Minister for Employment and Economic Development and the Minister for Primary Industries, Fisheries and Rural and Regional Queensland) Gurulmundi Secure Landfill Agreement Act 1992 Marine Parks Act 2004 Mineral Resources Act 1989 (to the extent that it is relevant to environmental matters) Mount Isa Mines Limited Agreement Act 1985 (to the extent that it is relevant to environmental matters) National Environment Protection Council (Queensland) Act 1994 National Trust of Queensland Act 1963 Nature Conservation Act 1992 (except to the extent that it is relevant to demonstrated and exhibited native animals) (jointly administered by the Minister for Primary Industries, Fisheries and Rural and Regional Queensland) Newstead House Trust Act 1939 Queensland Heritage Act 1992 Queensland Nickel Agreement Act 1970 (to the extent that it is relevant to environmental matters)		

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Queensland Nickel Agreement Act 1988 (to the extent that it is relevant to environmental matters) Recreation Areas Management Act 2006 Thiess Peabody Coal Pty. Ltd. Agreement Act 1962 (to the extent that it is relevant to environmental matters) Thiess Peabody Mitsui Coal Pty. Ltd. Agreements Act 1965 (to the extent that it is relevant to environmental matters) Torres Strait Islander Land Act 1991 (s 80(2)- (11); s 131 (as it applies to the provisions of the Act administered by the Minister)) Tweed River Entrance Sand Bypassing Project Agreement Act 1998 Wet Tropics World Heritage Protection and Management Act 1993		

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
Attorney-General and Minister for Industrial Relations	Administration of Justice Administrative Reform Births, Deaths and Marriages Censorship Coroners Criminal Justice Reform Criminal Proceedings Dispute Resolution Elections and Referendums Individual Rights and Freedoms Judges and Magistrates Justices of the Peace and Commissioners for Declarations Law Reform Legal Advice and Services to Government Legal Aid Legal Profession Substituted Decision Making	Aboriginal and Torres Strait Islander Communities (Justice, Land and Other Matters) Act 1984 Part 4, sections 18-25 (sections 4, 8, 64-67, 70 and 71 jointly administered with the Minister for Local Government and Aboriginal and Torres Strait Islander Partnerships, the Minister for Community Services and Housing and Minister for Women, and the Minister for Disability Services and Multicultural Affairs) Aboriginal Land Act 1991 (sections 50 to 62; Part 8; sections 134 and 138 as they apply to the provisions of the Act administered by the Minister) Acts Interpretation Act 1954 Adoption Act 2009 (Part 14A) Anti-Discrimination Act 1991 Appeal Costs Fund Act 1973 Attorney-General Act 1999 Australia and New Zealand Banking Group Limited (NMRB) Act 1991 Australian Consular Officers' Notarial Powers and Evidence Act 1946 Bail Act 1980 Births, Deaths and Marriages Registration Act 2003 Body Corporate and Community Management Act 1997, Chapter 6, Chapter 7, Part 1, ss 313A, 319, 346, 354, 359, 360 and 361 and Schedule 5 (ss 320, 322, 341 and Schedule 6 jointly administered with the Minister for Tourism and Fair Trading) British Probates Act 1898 Burials Assistance Act 1965 Carruthers Inquiry Enabling Act 1996 Cattle Stealing Prevention Act 1853 Child Protection Act 1999 (Chapter 2A)	Department of Justice and Attorney-General	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Childrens Court Act 1992 (except to the extent administered by the Minister for Child Safety and Minister for Sport and the Minister for Community Services and Housing and Minister for Women) Choice of Law (Limitation Periods) Act 1996 Civil Liability Act 2003 Classification of Computer Games and Images Act 1995 Classification of Films Act 1991 Classification of Publications Act 1991 Commercial Arbitration Act 1990 Commissions of Inquiry Act 1950 Commonwealth Places (Administration of Laws) Act 1970 Commonwealth Powers (De Facto Relationships) Act 2003 Commonwealth Powers (Family Law - Children) Act 1990 Companies (Acquisition of Shares) (Application of Laws) Act 1981 Companies and Securities (Interpretation and Miscellaneous Provisions) (Application of Laws) Act 1981 Companies (Application of Laws) Act 1981 Co-operative Schemes (Administrative Actions) Act 2001 Coroners Act 2003 Corporations (Administrative Actions) Act 2001 Corporations (Ancillary Provisions) Act 2001 Corporations (Commonwealth Powers) Act 2001 Corporations (Queensland) Act 1990 Court Funds Act 1973 Cremations Act 2003 Crime and Misconduct Act 2001 Crimes at Sea Act 2001 Criminal Code Act 1899 (including Criminal Code) Criminal Code Amendment Act 1922 Criminal Law Amendment Act 1892		

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Criminal Law Amendment Act 1894 Criminal Law Amendment Act 1945 Criminal Law (Rehabilitation of Offenders) Act 1986 Criminal Law (Sexual Offences) Act 1978 Criminal Organisation Act 2009 Criminal Proceeds Confiscation Act 2002 Crown Proceedings Act 1980 Dangerous Prisoners (Sexual Offenders) Act 2003 Defamation Act 2005 Director of Public Prosecutions Act 1984 Disposal of Unexecuted Warrants Act 1985 Dispute Resolution Centres Act 1990 District Court of Queensland Act 1967 Dividing Fences Act 1953 Domicile Act 1981 Drug Court Act 2000 Drugs Misuse Act 1986 (except to the extent administered by the Minister for Primary Industries, Fisheries and Rural and Regional Queensland) Electoral Act 1992 Electronic Transactions (Queensland) Act 2001 Evidence Act 1977 Evidence and Discovery Act 1867 Evidence (Attestation of Documents) Act 1937 Evidence on Commission Act 1988 Federal Courts (State Jurisdiction) Act 1999 Financial Transaction Reports Act 1992 Futures Industry (Application of Laws) Act 1986 Guardianship and Administration Act 2000 Imperial Acts Application Act 1984 Information Privacy Act 2009 Invasion of Privacy Act 1971 Judges (Pensions and Long Leave) Act 1957 (except to the extent administered by the Treasurer and Minister for Employment and Economic Development)		

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Judicial Remuneration Act 2007 Judicial Review Act 1991 Jurisdiction of Courts (Cross-vesting) Act 1987 Jury Act 1995 Justice and Other Information Disclosure Act 2008 Justices Act 1886 Justices of the Peace and Commissioners for Declarations Act 1991 Land and Resources Tribunal Act 1999 Land Court Act 2000 Law Reform Act 1995 Law Reform Commission Act 1968 Legal Aid Queensland Act 1997 Legal Profession Act 2007 Limitation of Actions Act 1974 Magistrates Act 1991 Magistrates Courts Act 1921 Maintenance Act 1965 Oaths Act 1867 Ombudsman Act 2001 Peace and Good Behaviour Act 1982 Peaceful Assembly Act 1992 Penalties and Sentences Act 1992 Personal Injuries Proceedings Act 2002 Powers of Attorney Act 1998 Printing and Newspapers Act 1981 Prisoners International Transfer (Queensland) Act 1997 Prisoners (Interstate Transfer) Act 1982 Professional Standards Act 2004 Property Law Act 1974 Queensland Civil and Administrative Tribunal Act 2009 Recording of Evidence Act 1962 Referendums Act 1997 Regulatory Offences Act 1985 Retail Shop Leases Act 1994 Right to Information Act 2009 Securities Industry (Application of Laws) Act 1981		

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Solicitor-General Act 1985 Standard Time Act 1894 State Penalties Enforcement Act 1999 Status of Children Act 1978 Succession Act 1981 Supreme Court Act 1995 Supreme Court Library Act 1968 Supreme Court of Queensland Act 1991 Surrogacy Act 2010 Telecommunications Interception Act 2009 Terrorism (Commonwealth Powers) Act 2002 Torres Strait Islander Land Act 1991 (sections 47 to 59; Part 8; sections 131 and 135 as they apply to the provisions of the Act administered by the Minister) Trust Accounts Act 1973 Trustee Companies Act 1968 Trusts Act 1973 Vexatious Proceedings Act 2005 Victims of Crime Assistance Act 2009 Witness Protection Act 2000		
	Chemical Hazards Electrical Safety Industrial Relations Public Sector Employment Remuneration and conditions of employment of public service employees, other than senior executives and officers on contract whose remuneration is equal to, or higher than, the remuneration payable to a senior executive Public Sector Wages Policy and Enterprise Bargaining Workers' Compensation Workplace Health and Safety	Anzac Day Act 2005 Building and Construction Industry (Portable Long Service Leave) Act 1991 Child Employment Act 2006 Contract Cleaning Industry (Portable Long Service Leave) Act 2005 Dangerous Goods Safety Management Act 2001 Electrical Safety Act 2002 Fair Work (Commonwealth Powers) and Other Provisions Act 2009 Holidays Act 1983 Industrial Relations Act 1999 Pastoral Workers' Accommodation Act 1980 Private Employment Agents Act 2005 Trading (Allowable Hours) Act 1990 Workers' Accommodation Act 1952		

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Workers' Compensation and Rehabilitation Act 2003 Workplace Health and Safety Act 1995		
	Public Trustee	Public Trustee Act 1978	Public Trust Office	Public Trustee

ADMINISTRATIVE ARRANGEMENTS ORDER (No. 1) 2011

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Short Title

1. This order in council may be cited as the *Administrative Arrangements Order (No. 1) 2011.*

Administrative Arrangements

2. (1) The public business of the State is distributed among Ministers as set out in the Schedule.

(2) Each Minister is to administer the matters set out in the Schedule next to the Minister's title as follows:

(a) the matters connected with the public business of the State listed under the heading '*Principal Ministerial Responsibilities*';

(b) the legislation listed under the heading '*Acts Administered*'; and

(c) the administrative units listed under the heading '*Administrative Units*'.

(3) Information in the Schedule under the heading '*Responsible Heads*' is included for information only and does not form part of this order.

Repeal of earlier Administrative Arrangements

3. The *Administrative Arrangements Order (No. 1) 2010* is repealed.

ENDNOTES

1. Made by the Governor in Council on 21 February 2011.
2. Published in the Government Gazette on 21 February 2011.
3. The administering agency is the Department of the Premier and Cabinet.

SCHEDULE

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
Premier and Minister for Reconstruction	Administrative Reform Assistance to Cabinet and its Committees Co-ordination of Government Administration Co-ordination of Policy Development Government Air Wing Legislative Drafting	Assisted Students (Enforcement of Obligations) Act 1951 Auditor-General Act 2009 Australian Constitutions Act 1842 (Imperial) Australian Constitutions Act 1844 (Imperial) Australian Waste Lands Act 1855 (Imperial) Century Zinc Project Act 1997 (ss1-4, 5(1), 8, 18-20) Commonwealth Powers (Air Transport) Act 1950 Constitution Act 1867 Constitution Act Amendment Act 1890 Constitution Act Amendment Act 1934 Constitution of Queensland 2001 Constitutional Powers (Coastal Waters) Act 1980 Emblems of Queensland Act 2005 Governors (Salary and Pensions) Act 2003 Integrity Act 2009 Legislative Standards Act 1992 Ministerial and Other Office Holder Staff Act 2010 Off-shore Facilities Act 1986 Parliament of Queensland Act 2001 Parliamentary Service Act 1988 Queensland Boundaries Declaratory Act 1982 Queensland Coast Islands Act 1879 Queensland International Tourist Centre Agreement Act Repeal Act 1989 Reprints Act 1992 Senate Elections Act 1960 South Bank Corporation Act 1989 Statute of Westminster 1931 (Imperial) Statute of Westminster Adoption Act 1942 (Cwlth) Statutory Instruments Act 1992	Department of the Premier and Cabinet	Director-General
	Reconstruction of Queensland following statewide flooding and Cyclone Yasi 2010-2011	Queensland Reconstruction Authority Act 2011	Queensland Reconstruction Authority	Chief Executive Officer

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
	Overall public service management and employment conditions to ensure the development of a highly professional public service in the areas of capability and performance, public service reform and governance.	Public Interest Disclosure Act 2010 Public Sector Ethics Act 1994 Public Service Act 2008	Public Service Commission	Commission Chief Executive
Deputy Premier and Attorney-General, Minister for Local Government and Special Minister of State	Administration of Justice Administrative Reform Births, Deaths and Marriages Censorship Coroners Criminal Justice Reform Criminal Proceedings Dispute Resolution Elections and Referendums Individual Rights and Freedoms Judges and Magistrates Justices of the Peace and Commissioners for Declarations Law Reform Legal Advice and Services to Government Legal Aid Legal Profession Substituted Decision Making	Aboriginal and Torres Strait Islander Communities (Justice, Land and Other Matters) Act 1984 Part 4, sections 18-25 (sections 4, 8, 64-67, 70 and 71 jointly administered with the Minister for Disability Services, Mental Health and Aboriginal and Torres Strait Islander Partnerships, and the Minister for Community Services and Housing and Minister for Women) Aboriginal Land Act 1991 (sections 50 to 62; Part 8; sections 134 and 138 as they apply to the provisions of the Act administered by the Minister) Acts Interpretation Act 1954 Adoption Act 2009 (Part 14A) Anti-Discrimination Act 1991 Appeal Costs Fund Act 1973 Attorney-General Act 1999 Australia and New Zealand Banking Group Limited (NMRB) Act 1991 Australian Consular Officers' Notarial Powers and Evidence Act 1946 Bail Act 1980 Births, Deaths and Marriages Registration Act 2003 Body Corporate and Community Management Act 1997 British Probates Act 1898 Burials Assistance Act 1965 Carruthers Inquiry Enabling Act 1996 Cattle Stealing Prevention Act 1853 Child Protection Act 1999 (Chapter 2A) Childrens Court Act 1992 (except to the extent administered by the Minister for Child Safety and	Department of Justice and Attorney-General	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Minister for Sport and the Minister for Community Services and Housing and Minister for Women) Choice of Law (Limitation Periods) Act 1996 Civil Liability Act 2003 Classification of Computer Games and Images Act 1995 Classification of Films Act 1991 Classification of Publications Act 1991 Commercial Arbitration Act 1990 Commissions of Inquiry Act 1950 Commonwealth Places (Administration of Laws) Act 1970 Commonwealth Powers (De Facto Relationships) Act 2003 Commonwealth Powers (Family Law-Children) Act 1990 Companies (Acquisition of Shares) (Application of Laws) Act 1981 Companies and Securities (Interpretation and Miscellaneous Provisions) (Application of Laws) Act 1981 Companies (Application of Laws) Act 1981 Co-operative Schemes (Administrative Actions) Act 2001 Coroners Act 2003 Corporations (Administrative Actions) Act 2001 Corporations (Ancillary Provisions) Act 2001 Corporations (Commonwealth Powers) Act 2001 Corporations (Queensland) Act 1990 Court Funds Act 1973 Cremations Act 2003 Crime and Misconduct Act 2001 Crimes at Sea Act 2001 Criminal Code Act 1899 (including Criminal Code) Criminal Code Amendment Act 1922 Criminal Law Amendment Act 1892 Criminal Law Amendment Act 1894 Criminal Law Amendment Act 1945 Criminal Law (Rehabilitation of Offenders) Act 1986 Criminal Law (Sexual Offences) Act 1978 Criminal Organisation Act 2009		

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Criminal Proceeds Confiscation Act 2002 Crown Proceedings Act 1980 Dangerous Prisoners (Sexual Offenders) Act 2003 Defamation Act 2005 Director of Public Prosecutions Act 1984 Disposal of Unexecuted Warrants Act 1985 Dispute Resolution Centres Act 1990 District Court of Queensland Act 1967 Dividing Fences Act 1953 Domicile Act 1981 Drug Court Act 2000 Drugs Misuse Act 1986 (except to the extent administered by the Minister for Agriculture, Food and Regional Economies) Electoral Act 1992 Electronic Transactions (Queensland) Act 2001 Evidence Act 1977 Evidence and Discovery Act 1867 Evidence (Attestation of Documents) Act 1937 Evidence on Commission Act 1988 Federal Courts (State Jurisdiction) Act 1999 Financial Transaction Reports Act 1992 Futures Industry (Application of Laws) Act 1986 Guardianship and Administration Act 2000 Imperial Acts Application Act 1984 Information Privacy Act 2009 Invasion of Privacy Act 1971 Judges (Pensions and Long Leave) Act 1957 (except to the extent administered by the Treasurer and Minister for State Development and Trade) Judicial Remuneration Act 2007 Judicial Review Act 1991 Jurisdiction of Courts (Cross-vesting) Act 1987 Jury Act 1995 Justice and Other Information Disclosure Act 2008 Justices Act 1886 Justices of the Peace and Commissioners for Declarations Act 1991 Land and Resources Tribunal Act 1999		

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Land Court Act 2000 Law Reform Act 1995 Law Reform Commission Act 1968 Legal Aid Queensland Act 1997 Legal Profession Act 2007 Limitation of Actions Act 1974 Magistrates Act 1991 Magistrates Courts Act 1921 Maintenance Act 1965 Oaths Act 1867 Ombudsman Act 2001 Peace and Good Behaviour Act 1982 Peaceful Assembly Act 1992 Penalties and Sentences Act 1992 Personal Injuries Proceedings Act 2002 Powers of Attorney Act 1998 Printing and Newspapers Act 1981 Prisoners International Transfer (Queensland) Act 1997 Prisoners (Interstate Transfer) Act 1982 Professional Standards Act 2004 Property Law Act 1974 Queensland Civil and Administrative Tribunal Act 2009 Recording of Evidence Act 1962 Referendums Act 1997 Regulatory Offences Act 1985 Retail Shop Leases Act 1994 Right to Information Act 2009 Securities Industry (Application of Laws) Act 1981 Solicitor-General Act 1985 Standard Time Act 1894 State Penalties Enforcement Act 1999 Status of Children Act 1978 Succession Act 1981 Supreme Court Act 1995 Supreme Court Library Act 1968 Supreme Court of Queensland Act 1991 Surrogacy Act 2010 Telecommunications Interception Act 2009 Terrorism (Commonwealth Powers) Act 2002		

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Torres Strait Islander Land Act 1991 (sections 47 to 59; Part 8; sections 131 and 135 as they apply to the provisions of the Act administered by the Minister) Trust Accounts Act 1973 Trustee Companies Act 1968 Trusts Act 1973 Vexatious Proceedings Act 2005 Victims of Crime Assistance Act 2009 Witness Protection Act 2000		

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
	Business Names Charities Community Services including— • Regulation of Retirement Villages Consumer Affairs Consumer Credit Incorporated Associations Occupational licensing • Auctioneers and Real Estate Agents • Commercial Agents • Motor Dealers • Travel Agents Profiteering Prevention Security Providers Supervision of Commercial Acts Trade Measurement	All Saints Church Lands Act 1924 All Saints Church Lands Act 1960 Anglican Church of Australia Act 1895 Anglican Church of Australia Act 1895 Amendment Act 1901 Anglican Church of Australia Act 1977 Anglican Church of Australia Constitution Act 1961 Anglican Church of Australia (Diocese of Brisbane) Property Act 1889 Ann Street Presbyterian Church Act 1889 Associations Incorporation Act 1981 Bills of Sale and Other Instruments Act 1955 Bishopsbourne Estate and See Endowment Trusts Act 1898 Boonah Show Ground Act 1914 Building Units and Group Titles Act 1980 (Parts 4 and 5; sections 121 to 125; sections 127 to 132; Schedules 2, 3 and 4; sections 5, 5A, 119, 133 and 134 jointly administered with the Minister for Environment and Resource Management) Business Names Act 1962 Charitable Funds Act 1958 Chinese Temple Society Act 1964 Churches of Christ, Scientist, Incorporation Act 1964 Collections Act 1966 Cooperatives Act 1997 Credit (Commonwealth Powers) Act 2010 Credit (Rural Finance) Act 1996 Disposal of Uncollected Goods Act 1967 Factors Act 1892 Fair Trading Act 1989 Funeral Benefit Business Act 1982 Guides Queensland Act 1970 Introduction Agents Act 2001 Land Sales Act 1984 Liens on Crops of Sugar Cane Act 1931 Manufactured Homes (Residential Parks) Act 2003 Mercantile Act 1867 Motor Vehicles and Boats Securities Act 1986		

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Partnership Act 1891 Personal Property Securities (Ancillary Provisions) Act 2010 Personal Property Securities (Commonwealth Powers) Act 2009 Presbyterian Church of Australia Act 1900 Presbyterian Church of Australia Act 1971 Property Agents and Motor Dealers Act 2000 Queensland Congregational Union Act 1967 Queensland Temperance League Lands Act 1985 Residential Services (Accreditation) Act 2002 Retirement Villages Act 1999 Returned & Services League of Australia (Queensland Branch) Act 1956 Returned Servicemen's Badges Act 1956 Roman Catholic Church (Corporation of the Sisters of Mercy of the Diocese of Cairns) Lands Vesting Act 1945 Roman Catholic Church (Incorporation of Church Entities) Act 1994 Roman Catholic Church Lands Act 1985 Roman Catholic Church (Northern Lands) Vesting Act 1941 Roman Catholic Relief Act 1830 Sale of Goods Act 1896 Sale of Goods (Vienna Convention) Act 1986 Salvation Army (Queensland) Property Trust Act 1930 Scout Association of Australia Queensland Branch Act 1975 Sea-Carriage Documents Act 1996 Second-hand Dealers and Pawnbrokers Act 2003 Security Providers Act 1993 Storage Liens Act 1973 Tourism Services Act 2003 Trade Measurement Legislation Repeal Act 2009		

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Travel Agents Act 1988 United Grand Lodge of Antient Free and Accepted Masons of Queensland Trustees Act 1942 Uniting Church in Australia Act 1977 Wesleyan Methodist Trust Property Act 1853 Wesleyan Methodists, Independents, and Baptists Churches Act 1838		
	Art Unions Casinos Golden Casket Liquor Licensing Machine Gaming	Breakwater Island Casino Agreement Act 1984 Brisbane Casino Agreement Act 1992 Cairns Casino Agreement Act 1993 Casino Control Act 1982 Charitable and Non-Profit Gaming Act 1999 Gaming Machine Act 1991 (except to the extent administered by the Treasurer and Minister for State Development and Trade) Interactive Gambling (Player Protection) Act 1998 Jupiters Casino Agreement Act 1983 Keno Act 1996 Liquor Act 1992 (except to the extent administered by the Treasurer and Minister for State Development and Trade) Lotteries Act 1997 TAB Queensland Limited Privatisation Act 1999 Wagering Act 1998 Wine Industry Act 1994		
	Public Trustee	Public Trustee Act 1978	Public Trust Office	Public Trustee
	Local Government, including Aboriginal and Torres Strait Island Councils	Aboriginal and Torres Strait Islander Communities (Justice, Land and Other Matters) Act 1984 (Part 9, Div 2 and Part 10) Animal Management (Cats and Dogs) Act 2008 Central Queensland Coal Associates Agreement Act 1968 (Sch pt VI) Century Zinc Project Act 1997 (ss14-17) City of Brisbane Act 2010 Family Services Act 1987 (Part 3) (jointly administered	Department of Local Government and Planning	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		with the Minister for Child Safety and Minister for Sport) Local Government (Aboriginal Lands) Act 1978 Local Government Act 2009		
	Building and Plumbing Standards Land Use Planning Licensing of Plumbers and Drainers Urban Growth	Building Act 1975 Iconic Queensland Places Act 2008 Integrated Resort Development Act 1987 Local Government (Robina Central Planning Agreement) Act 1992 Mixed Use Development Act 1993 Planning (Urban Encroachment - Milton Brewery) Act 2009 Plumbing and Drainage Act 2002 Royal National Agricultural and Industrial Association of Queensland Act 1971 Sanctuary Cove Resort Act 1985 Southern Moreton Bay Islands Development Entitlements Protection Act 2004 Sustainable Planning Act 2009 Urban Land Development Authority Act 2007		
Treasurer and Minister for State Development and Trade	Capital Works Monitoring Community Investment Fund Financial and Economic Policy Government Statistics Government Superannuation Public Sector Financial Policy State Actuary State Budget State Taxation (Administration) State Taxation (Policy)	Advance Bank Integration Act 1997 Airport Assets (Restructuring and Disposal) Act 2008 Anzac Square Development Project Act 1982 Appropriation Act 2008 Appropriation Act 2009 Appropriation Act 2010 Appropriation Act (No. 2) 2008 Appropriation (Parliament) Act 2008 Appropriation (Parliament) Act 2009 Appropriation (Parliament) Act 2010 Appropriation (Parliament) Act (No. 2) 2008 Bank Integration (Bank of Queensland) Act 1993 Bank Merger (BankSA and Advance Bank) Act 1996 Bank of New Zealand (Transfer of Undertaking) Act 1997 Brisbane Markets Act 2002 Brisbane Trades Hall Management Act 1984 Central Queensland Coal Associates Agreement Act 1968 (Sch pt V)	Treasury Department	Under Treasurer

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*

Challenge Bank (Transfer of Undertaking) Act 1996
Commonwealth and State Statistical Agreement Act 1958
Commonwealth Places (Mirror Taxes Administration) Act 1999
Commonwealth Savings Bank of Australia Agreement Act 1966
Community Ambulance Cover Act 2003
Competition Policy Reform (Queensland) Act 1996
Dalrymple Bay Coal Terminal (Long-term Lease) Act 2001
Debits Tax Repeal Act 2005
Duties Act 2001
Energy Assets (Restructuring and Disposal) Act 2006
Family Security Friendly Society (Distribution of Moneys) Act 1991
Financial Accountability Act 2009
Financial Agreement Act 1994
Financial Intermediaries Act 1996
Financial Sector Reform (Queensland) Act 1999
First Home Owner Grant Act 2000
Fuel Subsidy Repeal Act 2009
Future Growth Fund Act 2006
Gaming Machine Act 1991 (ss 314(1), 314(3), 322(5))
Government Inscribed Stock Act 1920
Government Loan Act 1986
Government Loans Redemption and Conversion Act 1923
Government Stock Act 1912
GST and Related Matters Act 2000
Infrastructure Investment (Asset Restructuring and Disposal) Act 2009
Judges (Pensions and Long Leave) Act 1957 (s17)
Land Tax Act 2010
Liquor Act 1992 (s219(2), 219(3) and 220 (3))
New Tax System Price Exploitation Code (Queensland) Act 1999
Payroll Tax Act 1971
Public Officers Superannuation Benefits Recovery Act 1988
Queensland Competition Authority Act 1997 (jointly administered with the Minister for Finance and The Arts)

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Queensland Investment Corporation Act 1991 Queensland Nickel Agreement Act 1970 (all financial and related matters) Queensland Treasury Corporation Act 1988 State Bank of South Australia (Transfer of Undertaking) Act 1994 State Financial Institutions and Metway Merger Facilitation Act 1996 Statistical Returns Act 1896 Statutory Authorities (Superannuation Arrangements) Act 1994 Statutory Bodies Financial Arrangements Act 1982 Superannuation (Public Employees Portability) Act 1985 Superannuation (State Public Sector) Act 1990 Taxation Administration Act 2001 Tobacco Products (Licensing) Act 1988		
	Administration of Crown Copyright and Intellectual Property Economic Development including: • Industry Development • Business Development • Investment Opportunities and Attraction • Research and Development Co-ordination and Planning Innovation International Collaborations	Biodiscovery Act 2004 Gene Technology Act 2001	Department of Employment, Economic Development and Innovation	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
	Industrial Development Infrastructure Coordination and Planning Major Development Project Facilitation	Alcan Queensland Pty. Limited Agreement Act 1965 (except to the extent administered by the Minister for Environment and Resource Management) Amoco Australia Pty. Limited Agreement Act 1961 Ampol Refineries Limited Agreement Act 1964 Austral-Pacific Fertilizers Limited Agreement Act 1967 Central Queensland Coal Associates Agreement Act 1968 (except to the extent administered by the Minister for Transport and Multicultural Affairs and the Minister for Environment and Resource Management) Central Queensland Coal Associates Agreement (Amendment) Act 1986 (except to the extent administered by the Minister for Environment and Resource Management) Central Queensland Coal Associates Agreement Amendment Act 1989 (except to the extent administered by the Minister for Environment and Resource Management) Central Queensland Coal Associates Agreement and Queensland Coal Trust Act 1984 (except to the extent administered by the Minister for Environment and Resource Management) Central Queensland Coal Associates Agreement Variation Act 1996 Industrial Development Act 1963 Queensland Nickel Agreement Act 1970 (except to the extent administered by the Minister for Transport and Multicultural Affairs and the Minister for Environment and Resource Management) Queensland Nickel Agreement Act 1988 (except to the extent administered by the Minister for Environment and Resource Management) State Development and Public Works Organisation Act 1971 Townsville Breakwater Entertainment Centre Act 1991 Townsville City Council (Douglas Land Development) Act 1993 Townsville Zinc Refinery Act 1996	Department of Employment, Economic Development and Innovation	Coordinator-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
	Trade Development	Agent-General for Queensland Act 1975	Department of Employment, Economic Development and Innovation	Director-General
Minister for Health	Aboriginal and Torres Strait Islander Health Alcohol and Drug Services Community Health Services Disease Surveillance Health Care for Special Needs Groups Health Promotion Health Rights Hospitals Mental Health Nursing Homes and Hostels Offender Health Services of Prisoners Oral Health Public Health Registration of Health Professionals	Dental Technicians Registration Act 2001 Food Act 2006 Health Act 1937 Health Practitioner Registration Boards (Administration) Act 1999 Health Practitioner Regulation National Law Act 2009 Health Practitioners (Professional Standards) Act 1999 Health Practitioners (Special Events Exemption) Act 1998 Health Quality and Complaints Commission Act 2006 Health Services Act 1991 (jointly administered with the Minister for Disability Services, Mental Health and Aboriginal and Torres Strait Islander Partnerships) Hospitals Foundations Act 1982 Mater Public Health Services Act 2008 Medical Radiation Technologists Registration Act 2001 Mental Health Act 2000 (jointly administered with the Minister for Disability Services, Mental Health and Aboriginal and Torres Strait Islander Partnerships) Occupational Therapists Registration Act 2001 Pest Management Act 2001 Pharmacy Business Ownership Act 2001 Private Health Facilities Act 1999 Public Health Act 2005 Public Health (Infection Control for Personal Appearance Services) Act 2003 Queensland Institute of Medical Research Act 1945 Radiation Safety Act 1999 Research Involving Human Embryos and Prohibition of Human Cloning for Reproduction Act 2003 Speech Pathologists Registration Act 2001 Tobacco and Other Smoking Products Act 1998 Transplantation and Anatomy Act 1979 Water Fluoridation Act 2008	Department of Health	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
Minister for Police, Corrective Services and Emergency Services	Police Services	Australian Crime Commission (Queensland) Act 2003 Child Protection (Offender Prohibition Order) Act 2008 Child Protection (Offender Reporting) Act 2004 Police Powers and Responsibilities Act 2000 Police Service Administration Act 1990 Prostitution Act 1999 Public Safety Preservation Act 1986 Queensland Police Welfare Club Act 1970 Summary Offences Act 2005 Terrorism (Preventative Detention) Act 2005 Weapons Act 1990	Department of Police	Commissioner of the Police Service
	Adult Corrective Services (excluding offender health services)	Corrective Services Act 2006 Parole Orders (Transfer) Act 1984	Department of Community Safety	Director-General
	Ambulance Service Disaster Management and State Emergency Service Emergency Helicopter Services Fire Service	Ambulance Service Act 1991 Disaster Management Act 2003 Fire and Rescue Service Act 1990		
Minister for Energy and Water Utilities	Energy and Water Utilities including– • Clean Energy • Electricity and Gas Sectors and Markets Regulation, Monitoring and Consumer Protection • Energy Efficiency • Energy Industry Development • Geothermal Energy • Nuclear Energy Policy • Renewable Energy • Reticulated Fuel Gas Distribution and Retail • Sufficiency of Supply of Fuel Gas and Liquid Fuel	Clean Energy Act 2008 Electricity Act 1994 Electricity-National Scheme (Queensland) Act 1997 Energy and Water Ombudsman Act 2006 Gas Supply Act 2003 Geothermal Energy Act 2010 Gladstone Power Station Agreement Act 1993 Liquid Fuel Supply Act 1984 National Gas (Queensland) Act 2008	Department of Employment, Economic Development and Innovation	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
	• Bulk Water supply, distribution and retail arrangements	South-East Queensland Water (Distribution and Retail Restructuring) Act 2009		
		South East Queensland Water (Restructuring) Act 2007 (in so far as the Minister is a Responsible Minister for the purpose of Chapter 2 of this Act)	Queensland Bulk Water Supply Authority	Chief Executive Officer
			Queensland Bulk Water Transport Authority	Chief Executive Officer
			Queensland Manufactured Water Authority	Chief Executive Officer
			SEQ Water Grid Manager	Chief Executive Officer
Minister for Main Roads, Fisheries and Marine Infrastructure	Busways Main Roads Maritime Ports	Australian Shipping Commission Authorization Act 1977 Maritime Safety Queensland Act 2002 Transport Infrastructure Act 1994 (jointly administered with the Minister for Transport and Multicultural Affairs) Transport Operations (Marine Pollution) Act 1995 Transport Operations (Marine Safety) Act 1994 Transport Planning and Coordination Act 1994 (jointly administered with the Minister for Transport and Multicultural Affairs)	Department of Transport and Main Roads	Director-General
	Fisheries	Fisheries Act 1994 Torres Strait Fisheries Act 1984	Department of Employment, Economic Development and Innovation	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
Minister for Education and Industrial Relations	Early Childhood Education and Care including— • Kindergarten Programs Education including- • Aboriginal and Torres Strait Islander Education • Distance Education • Education of Students in Youth Detention Centres • International Education • Primary Education • Secondary Education • Special Education Higher Education including— • State Government Policy and Planning Non-State School Funding Registration of Teachers Smart State Education Initiatives	Australian Catholic University (Queensland) Act 2007 Bond University Act 1987 Child Care Act 2002 Central Queensland University Act 1998 Community Services Act 2007 (jointly administered with the Minister for Transport and Multicultural Affairs, the Minister for Community Services and Housing and Minister for Women, and the Minister for Disability Services, Mental Health and Aboriginal and Torres Strait Islander Partnerships) Education (Accreditation of Non-State Schools) Act 2001 Education (Capital Assistance) Act 1993 Education (General Provisions) Act 2006 Education (Overseas Students) Act 1996 Education (Queensland College of Teachers) Act 2005 Education (Queensland Studies Authority) Act 2002 Education (Work Experience) Act 1996 Grammar Schools Act 1975 Griffith University Act 1998 Higher Education (General Provisions) Act 2008 James Cook University Act 1997 Queensland University of Technology Act 1998 University of Queensland Act 1998 University of Southern Queensland Act 1998 University of the Sunshine Coast Act 1998	Department of Education and Training	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
	Chemical Hazards Electrical Safety Industrial Relations Public Sector Employment Remuneration and conditions of employment of public service employees, other than senior executives and officers on contract whose remuneration is equal to, or higher than, the remuneration payable to a senior executive Public Sector Wages Policy and Enterprise Bargaining Workers' Compensation Workplace Health and Safety	Anzac Day Act 1995 Building and Construction Industry (Portable Long Service Leave) Act 1991 Child Employment Act 2006 Contract Cleaning Industry (Portable Long Service Leave) Act 2005 Dangerous Goods Safety Management Act 2001 Electrical Safety Act 2002 Fair Work (Commonwealth Powers) and Other Provisions Act 2009 Holidays Act 1983 Industrial Relations Act 1999 Pastoral Workers' Accommodation Act 1980 Private Employment Agents Act 2005 Trading (Allowable Hours) Act 1990 Workers' Accommodation Act 1952 Workers' Compensation and Rehabilitation Act 2003 Workplace Health and Safety Act 1995	Department of Justice and Attorney-General	Director-General
Minister for Agriculture, Food and Regional Economies	Agricultural Chemicals Agricultural Colleges Animal Welfare Biosecurity Food and Fibre Production Food Processing and Value Adding Development Forestry Industry Development Plant and Animal Diseases Primary Industry Research, Development and Extension Private Forestry Racing Regional Communities Regional Economic Development Rural Communities	Agricultural and Veterinary Chemicals (Queensland) Act 1994 Agricultural Chemicals Distribution Control Act 1966 Agricultural College Act 2005 Agricultural Standards Act 1994 Animal Care and Protection Act 2001 Apiaries Act 1982 Biological Control Act 1987 Brands Act 1915 Chemical Usage (Agricultural and Veterinary) Control Act 1988 Chicken Meat Industry Committee Act 1976 Diseases in Timber Act 1975 Drugs Misuse Act 1986 (Part 5B) Eagle Farm Racecourse Act 1998 Exotic Diseases in Animals Act 1981 Food Production (Safety) Act 2000 Land Protection (Pest and Stock Route Management) Act 2002 (except to the extent that it is relevant to Stock Route	Department of Employment, Economic Development and Innovation	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Management) (jointly administered with the Minister for Environment and Resource Management) Nature Conservation Act 1992 (to the extent that it is relevant to demonstrated and exhibited native animals) (jointly administered by the Minister for Environment and Resource Management) Plant Protection Act 1989 Racing Act 2002 Racing Venues Development Act 1982 Rural and Regional Adjustment Act 1994 Stock Act 1915 Sugar Industry Act 1999 Veterinary Surgeons Act 1936		
Minister for Employment, Skills and Mining	Skills Queensland Vocational Education and Training including Technical and Further Education International Vocational Education and Training	Vocational Education, Training and Employment Act 2000	Department of Education and Training	Director-General
	Employment Promotion and Protection Employment Policies and Programs		Department of Employment, Economic Development and Innovation	Director-General
	Mining and Petroleum including – • Extractive Resource Planning • Gas Pipelines • Geological Survey, Exploration Promotion and Investment Attraction • Greenhouse Gas Storage • Land Access Policy • Mineral and Energy Resources • Mineral Resources Impacts on Aboriginal and Torres Strait	Aboriginal Land Act 1991 (Part 7) Alcan Queensland Pty. Limited Agreement Act 1965 (Sch – except to the extent administered by the Minister for Environment and Resource Management) Central Queensland Coal Associates Agreement Act 1968 (Sch pt III – except to the extent administered by the Minister for Environment and Resource Management) Century Zinc Project Act 1997 (s 10) Clean Coal Technology Special Agreement Act 2007		

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
	Islander Interests • Mining and Petroleum Industry Development • Mining, Petroleum and Geothermal Tenures • Native Title (relating to mining, petroleum and geothermal) • Pipeline Licences • Royalties and Rents Safety and Health including – • Abandoned Mines, Explosives, Extractive Industries, Gas, Geothermal, Mining and Petroleum	Coal and Oil Shale Mine Workers' Superannuation Act 1989 Coal Mining Safety and Health Act 1999 Commonwealth Aluminium Corporation Pty. Limited Agreement Act 1957 (except to the extent administered by the Minister for Environment and Resource Management) Explosives Act 1999 Fossicking Act 1994 Geothermal Exploration Act 2004 Greenhouse Gas Storage Act 2009 Land Act 1994 (ss 452A (2) and (3)) Mineral Resources Act 1989 (except to the extent administered by the Minister for Environment and Resource Management) Mining and Quarrying Safety and Health Act 1999 Mount Isa Mines Limited Agreement Act 1985 (except to the extent administered by the Minister for Environment and Resource Management) Nuclear Facilities Prohibition Act 2007 Offshore Minerals Act 1998 Petroleum Act 1923 Petroleum and Gas (Production and Safety) Act 2004 Petroleum (Submerged Lands) Act 1982 Queensland Nickel Agreement Act 1970 (Sch pts II-III, VI and VII) Thiess Peabody Coal Pty. Ltd. Agreement Act 1962 (except to the extent administered by the Minister for Environment and Resource Management) Thiess Peabody Mitsui Coal Pty. Ltd. Agreements Act 1965 (except to the extent administered by the Minister for Environment and Resource Management) Torres Strait Islander Land Act 1991 (Part 7)		

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
Minister for Finance and The Arts	Government Owned Enterprises Insurance Nominal Defendant Regulatory Reform	Government Owned Corporations Act 1993 Motor Accident Insurance Act 1994 Mutual Recognition (Queensland) Act 1992 Queensland Competition Authority Act 1997 (jointly administered with the Treasurer and Minister for State Development and Trade) Trans-Tasman Mutual Recognition (Queensland) Act 2003	Treasury Department	Under Treasurer
	Bulk Water supply, distribution and retail arrangements	South-East Queensland Water (Distribution and Retail Restructuring) Act 2009		
		South East Queensland Water (Restructuring) Act 2007 (in so far as the Minister is a Responsible Minister for the purpose of Chapter 2 of this Act)	Queensland Bulk Water Supply Authority	Chief Executive Officer
			Queensland Bulk Water Transport Authority	Chief Executive Officer
			Queensland Manufactured Water Authority	Chief Executive Officer
			SEQ Water Grid Manager	Chief Executive Officer
	Arts	Libraries Act 1988 Queensland Art Gallery Act 1987 Queensland Museum Act 1970 Queensland Performing Arts Trust Act 1977 Queensland Theatre Company Act 1970 Schools of Arts (Winding Up and Transfer) Act 1960 Schools of Arts (Winding Up and Transfer) Act Amendment Act 1981	Department of the Premier and Cabinet	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
Minister for Environment and Resource Management	Aboriginal and Torres Strait Islander matters including— • Land Interests • Land Titles • Aboriginal and Torres Strait Islander Cultural Heritage Climate Change Policy and Science Coastal Management Commercial Forestry for native forest under the Forestry Act 1959 Commercial Water Services Commercial Plantation Forestry Contaminated Land Custody and Management of State Forests including State Plantation Forests Ecologically Sustainable Development Environment including Management of Mining, including mines operating under special agreement acts Environmental Planning Historical Cultural Heritage Land including— • Allocation, Management and Use of State Land • Compulsory Acquisition • Conservation • Information • Land Protection • Land Titles • Surveying and Mapping • Valuations Marine Parks Management Native Forest Management Native Title (excluding for mining, petroleum and geothermal) Natural Resource Management	Aboriginal Cultural Heritage Act 2003 Aboriginal Land Act 1991 (except to the extent administered by the Deputy Premier and Attorney-General, Minister for Local Government and Special Minister of State); and (except Part 7) Aborigines and Torres Strait Islanders (Land Holding) Act 1985 Acquisition of Land Act 1967 Alcan Queensland Pty. Limited Agreement Act 1965 (Sch –to the extent that it is relevant to environmental matters) Allan and Stark Burnett Lane Subway Authorisation Act 1926 Brisbane Forest Park Act 1977 Building Units and Group Titles Act 1980 (except to the extent administered by the Deputy Premier and Attorney-General, Minister for Local Government and Special Minister of State; sections 5, 5A, 119, 133 and 134 jointly administered with the Deputy Premier and Attorney-General, Minister for Local Government and Special Minister of State) Cape York Peninsula Heritage Act 2007 Central Queensland Coal Associates Agreement Act 1968 (Sch 1 pt III – to the extent that it is relevant to environmental matters) Central Queensland Coal Associates Agreement (Amendment) Act 1986 (to the extent that is it relevant to environmental matters) Central Queensland Coal Associates Agreement Amendment Act 1989 (to the extent that it is relevant to environmental matters) Central Queensland Coal Associates Agreement and Queensland Coal Trust Act 1984 (to the extent that it is relevant to environmental matters) Century Zinc Project Act 1997 (s 9) Coastal Protection and Management Act 1995 Commonwealth Aluminium Corporation Pty. Limited Agreement Act 1957 (to the extent that it is relevant to environmental matters)	Department of Environment and Resource Management	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
	including— • Catchment Management • Water Resource Management Nature Conservation Place Names Pollution Management Quarry Sales under the Forestry Act 1959 Selling allocation of State quarry material under the Water Act 2000 Registration of Valuers and Surveyors Waste Management Water Recycling Strategy Wet Tropics Management	Currumbin Bird Sanctuary Act 1976 Environmental Protection Act 1994 Foreign Governments (Titles to Land) Act 1948 Foreign Ownership of Land Register Act 1988 Forestry Act 1959 Gurulmundi Secure Landfill Agreement Act 1992 Ipswich Trades Hall Act 1986 Lake Eyre Basin Agreement Act 2001 Land Act 1994 (except ss 452A(2) and (3)) Land Protection (Pest and Stock Route Management) Act 2002 (to the extent that it is relevant to Stock Route Management) (jointly administered with the Minister for Agriculture, Food and Regional Economies) Land Title Act 1994 Land Valuation Act 2010 Marine Parks Act 2004 Metropolitan Water Supply and Sewerage Act 1909 Mineral Resources Act 1989 (to the extent that it is relevant to environmental matters) Mount Isa Mines Limited Agreement Act 1985 (to the extent that it is relevant to environmental matters) National Environment Protection Council (Queensland) Act 1994 National Trust of Queensland Act 1963 Native Title (Queensland) Act 1993 Nature Conservation Act 1992 (except to the extent that it is relevant to demonstrated and exhibited native animals) (jointly administered by the Minister for Agriculture, Food and Regional Economies) Newstead House Trust Act 1939 New South Wales-Queensland Border Rivers Act 1946 Place Names Act 1994 Queensland Heritage Act 1992 Queensland Nickel Agreement Act 1970 (to the extent that it is relevant to environmental matters) Queensland Nickel Agreement Act 1988 (to the extent that it is relevant to environmental matters) Recreation Areas Management Act 2006 Registration of Plans (H.S.P. (Nominees) Pty. Limited)		

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Enabling Act 1980 Registration of Plans (Stage 2) (H.S.P. (Nominees) Pty. Limited) Enabling Act 1984 River Improvement Trust Act 1940 Soil Conservation Act 1986 Soil Survey Act 1929 Starcke Pastoral Holdings Acquisition Act 1994 Survey and Mapping Infrastructure Act 2003 Surveyors Act 2003 Thiess Peabody Coal Pty. Ltd. Agreement Act 1962 (to the extent that it is relevant to environmental matters) Thiess Peabody Mitsui Coal Pty. Ltd. Agreements Act 1965 (to the extent that it is relevant to environmental matters) Torres Strait Islander Cultural Heritage Act 2003 Torres Strait Islander Land Act 1991 (except to the extent administered by the Deputy Premier and Attorney-General, Minister for Local Government and Special Minister of State); and (except Part 7) Tweed River Entrance Sand Bypassing Project Agreement Act 1998 Valuers Registration Act 1992 Vegetation Management Act 1999 Water Act 2000 (except to the extent administered by the Minister for Environment and Resource Management through the Queensland Water Commission) Water (Commonwealth Powers) Act 2008 Water Efficiency Labelling and Standards Act 2005 Water Supply (Safety and Reliability) Act 2008 Wet Tropics World Heritage Protection and Management Act 1993 Wild Rivers Act 2005 Yeppoon Hospital Site Acquisition Act 2006		
		Water Act 2000 (Chapter 2A, Part 1, Part 2 Divisions 1, 2, 4, 5 and 7, Part 3 Divisions 1 and 2, Part 4, Part 5, Part 5A and Part 6)	Queensland Water Commission	Commissioner

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
Minister for Transport and Multicultural Affairs	Air Services Busways Land Transport and Safety Passenger Transport Railways Transport Infrastructure	Adult Proof of Age Card Act 2008 Air Navigation Act 1937 Brisbane River Tidal Lands Improvement Act 1927 Central Queensland Coal Associates Agreement Act 1968 (Sch pts IV-IVC) Century Zinc Project Act 1997 (ss 5(2)-(7), 11, 12, 13, 21) Civil Aviation (Carriers' Liability) Act 1964 Queensland Nickel Agreement Act 1970 (Sch pts IV-V) State Transport Act 1938 State Transport (People Movers) Act 1989 Thiess Peabody Mitsui Coal Pty. Ltd. Agreements Act 1965 Tow Truck Act 1973 Transport Infrastructure Act 1994 (jointly administered with the Minister for Main Roads, Fisheries and Marine Infrastructure) Transport Operations (Passenger Transport) Act 1994 Transport Operations (Road Use Management) Act 1995 Transport Operations (TransLink Transit Authority) Act 2008 Transport Planning and Coordination Act 1994 (jointly administered with the Minister for Main Roads, Fisheries and Marine Infrastructure) Transport (Rail Safety) Act 2010 Transport (South Bank Corporation Area Land) Act 1999 Transport Security (Counter-Terrorism) Act 2008	Department of Transport and Main Roads	Director-General
	Multicultural Affairs	Community Services Act 2007 (jointly administered with the Minister for Education and Industrial Relations, the Minister for Community Services and Housing and Minister for Women, and the Minister for Disability Services, Mental Health and Aboriginal and Torres Strait Islander Partnerships)	Department of Communities	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
Minister for Child Safety and Minister for Sport	Child Protection Services	Adoption Act 2009 (except to the extent administered by the Deputy Premier and Attorney-General, Minister for Local Government and Special Minister of State) Childrens Court Act 1992 (ss 20(1)(f), 20(2)(a)(ii))(jointly administered with the Minister for Community Services and Housing and Minister for Women) Child Protection Act 1999 (except to the extent administered by the Deputy Premier and Attorney-General, Minister for Local Government and Special Minister of State) Child Protection (International Measures) Act 2003 Family Services Act 1987 (Parts 1, 2 and 5 jointly administered with the Minister for Community Services and Housing and Minister for Women) (Part 3 jointly administered with the Minister for Disability Services, Mental Health and Aboriginal and Torres Strait Islander Partnerships)	Department of Communities	Director-General
	Motor Racing Events Recreation excluding Natural Resource Recreation and Education Sport	Major Sports Facilities Act 2001 Motor Racing Events Act 1990 Mt. Gravatt Showgrounds Act 1988 Sports Anti-Doping Act 2003		
Minister for Community Services and Housing and Minister for Women	Women's Policy Community Services Homelessness Seniors Social Inclusion Youth Affairs Youth Justice Youth Support and Prevention Programs and Centres	Childrens Court Act 1992 (ss 20(1)(f), 20(2)(a)(ii))(jointly administered with the Minister for Child Safety and Minister for Sport) Commission for Children and Young People and Child Guardian Act 2000 Community Services Act 2007 (jointly administered with the Minister for Education and Industrial Relations, the Minister for Transport and Multicultural Affairs, and the Minister for Disability Services, Mental Health and Aboriginal and Torres Strait Islander Partnerships) (Parts 1 to 9, 11 to 13 and Schedules 1 to 4 jointly administered with the Minister for Education and Industrial Relations)	Department of Communities	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
		Domestic and Family Violence Protection Act 1989 Family Services Act 1987 (Parts 1, 2 and 5 jointly administered with the Minister for Child Safety and Minister for Sport) (Part 3 jointly administered with the Minister for Disability Services, Mental Health and Aboriginal and Torres Strait Islander Partnerships and the Minister for Child Safety and Minister for Sport) Young Offenders (Interstate Transfer) Act 1987 Youth Justice Act 1992		
	Housing Services including— • Community Housing assistance • Housing assistance policy • Indigenous Housing assistance • Private Housing assistance • Public Housing	Housing Act 2003 Housing (Freeholding of Land) Act 1957 Inala Shopping Centre Freeholding Act 2006 Residential Tenancies and Rooming Accommodation Act 2008		
Minister for Tourism, Manufacturing and Small Business	Developing Queensland's Manufacturing Industry Developing Small Business Capability Tourism Promotion	Tourism Queensland Act 1979 Traveller Accommodation Providers (Liability) Act 2001	Department of Employment, Economic Development and Innovation	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
Minister for Government Services, Building Industry and Information and Communication Technology	Archives Government Accommodation and Public Service Residences Government Buildings including— • Design, Construction and Maintenance • Project Management • Protective Services Government Communication and Information Services Government Information Planning Government Motor Vehicles Government Printing and Publishing Government Purchasing (including electronic procurement) Licensing and regulation of the Queensland building industry Queensland home warranty insurance scheme Professional Practices and Registration of Professional Engineers and Architects Property Facilities Management and Property Related Services for Government Smart Service Queensland Shared Services Provision (other than Queensland Health, the Department of Education and Training, and that part of the Department of the Premier and Cabinet that services Arts Queensland) and Shared Services Systems Urban Design and Government Architect Warehousing and Distribution of General Merchandise and Furniture	Architects Act 2002 Building and Construction Industry Payments Act 2004 Domestic Building Contracts Act 2000 Professional Engineers Act 2002 Public Records Act 2002 Queensland Building Services Authority Act 1991 State Buildings Protective Security Act 1983 Subcontractors' Charges Act 1974	Department of Public Works	Director-General

Minister	*Principal Ministerial Responsibilities*	*Acts Administered*	*Administrative Units*	*Responsible Heads*
Minister for Disability Services, Mental Health and Aboriginal and Torres Strait Islander Partnerships	Disability Services Home and Community Care Mental Health	Carers (Recognition) Act 2008 Community Services Act 2007 (jointly administered with the Minister for Education and Industrial Relations, the Minister for Community Services and Housing and Minister for Women, and the Minister for Transport and Multicultural Affairs) (Parts 1 to 9, 11 to 13 and Schedules 1 to 4 jointly administered with the Minister for Education and Industrial Relations) Disability Services Act 2006 Guide, Hearing and Assistance Dogs Act 2009 Health Services Act 1991 (jointly administered with the Minister for Health) Mental Health Act 2000 (jointly administered with the Minister for Health)	Department of Communities	Director-General
	Aboriginal and Torres Strait Islander Policy Aboriginal and Torres Strait Islander Rights and Culture	Aboriginal and Torres Strait Islander Communities (Justice, Land and Other Matters) Act 1984 (except to the extent administered by the Deputy Premier and Attorney-General, Minister for Local Government and Special Minister of State); (sections 4, 8, 64-67, 70 and 71, jointly administered with the Deputy Premier and Attorney-General, Minister for Local Government and Special Minister of State) Community Services Act 2007 (jointly administered with the Minister for Community Services and Housing and Minister for Women) (Parts 1 to 9, 11 to 13 and Schedules 1 to 4 jointly administered with the Minister for Education and Industrial Relations) Family Responsibilities Commission Act 2008		

WATER ACT 2000 (QLD)

SOUTH EAST QUEENSLAND WATER GRID

GRID CONTRACT DOCUMENT

I, the Honourable Stephen Robertson MP, Minister for Natural Resources, Mines and Energy and Minister for Trade of the State of Queensland, hereby make this Grid Contract Document for the supply of Declared Water Services pursuant to section 360ZDD(1)(a) of the *Water Act 2000* (Qld) between:

Name:	South East Queensland Water Grid Manager
ABN:	14 783 317 630
Short name:	Water Grid Manager
Address:	Level 15 53 Albert Street Brisbane Queensland 4001
Facsimile:	[redacted]
Attention:	Chief Executive Officer

and

Name:	Queensland Bulk Water Supply Authority, trading as Seqwater
ABN	75 450 239 876
Short name:	Service Provider
Address:	PO Box 15236, City East Queensland 4002
Facsimile:	[redacted]
Attention:	Chief Executive Officer

This Grid Contract Document includes the following documents, each of which is attached to and forms part of this Grid Contract Document:

Appendix A	General terms and conditions
Schedule 1	Definitions
Schedule 2	ADWG Specifications
Schedule 3	Quality Parameters
Schedule 4	Manufactured Water Quality Requirements
Schedule 5	Bulk Supply Points
Schedule 6	Raw Water Metering (Power Stations)

This Grid Contract Document may not be amended except as set out in clause 32.8 and 32.9 of Appendix A.

Dated this 10 day of December 2010

The Honourable Stephen Robertson MP
Minister for Natural Resources, Mines and Energy and
Minister for Trade of the State of Queensland

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Appendix A – General terms and conditions

Background

A Water Grid Manager and Service Provider were established under section 6(1) of the Restructuring Act.

B Water Grid Manager holds various water entitlements under the Water Act and is a counterparty to Grid Contract Documents made by the Minister under section 360ZDD of the Water Act for the supply of Declared Water Services from Grid Service Providers and the supply of bulk water to Grid Customers.

C Service Provider is registered as a Bulk Supplier under the Market Rules and must carry out Bulk Supply Services in accordance with the Market Rules.

D This Contract sets out the terms and conditions upon which Service Provider will, in accordance with the Market Rules, store, release and access Potable Water and Raw Water for Water Grid Manager, treat Potable Water and Raw Water for Water Grid Manager, accept Purified Recycled Water at Manufactured Water Supply Points and make available Potable Water and Raw Water at Bulk Supply Points.

1. Definitions

Capitalised terms used in this Contract have the meanings specified in Schedule 1. Capitalised terms used and not defined in Schedule 1 have the meaning specified in the Market Rules.

2. Interpretation

(a) Sections 11.5 and 11.6 of the Market Rules apply to the interpretation of this Contract as though they were set out in this Contract with any necessary modifications to ensure consistency with this Contract.

(b) In this Contract:

(i) a reference to an Appendix or a Schedule is a reference to an Appendix or a Schedule to this Contract;

(ii) a reference to 'A$', '$A', 'dollar' or '$' is to Australian currency;

(iii) a reference to 'water' includes Manufactured Water; and

(iv) unless the context otherwise requires, a reference to the 'supply' or 'delivery' of Potable Water and Raw Water to any person includes making Potable Water and Raw Water available to such person.

(c) In this Appendix A, unless otherwise indicated, a reference to a clause is a reference to a clause in this Appendix A.

3. Resolving inconsistencies

Any inconsistency, ambiguity or discrepancy between the provisions of this Contract and the other documents or instruments listed in section 1.10 of the Market Rules, will be resolved in accordance with section 1.10 of the Market Rules.

4. Grid Contract Document

(a) This Contract is a Grid Contract Document made by the Minister under section 360ZDD(1)(a) of the Water Act.

(b) The Declared Water Services from which the water supplied to Water Grid Manager under this Contract is supplied are those Declared Water Services declared by the Minister, from time to time, under Chapter 2A, Part 5A, Division 2 or section 1161 of the Water Act.

(c) This Contract commences on the Commencement Date and, subject to clause 5, terminates on the Expiry Date (**Term**).

5. Extension

Subject to Chapter 2A of the Water Act:

(a) between 1 July 2019 and 31 December 2019, Service Provider may notify Water Grid Manager that it wishes to extend the term of this Contract by a period of up to 10 years (**Extension Notice**);

(b) if Service Provider gives an Extension Notice, the parties will use their best endeavours to negotiate and agree an extension of the Term and any amendments to the terms and conditions of the Contract;

(c) if, prior to 1 July 2020, the Parties agree in writing to extend the Term, the Term will be extended for the agreed period and this Contract will be varied as agreed (if applicable); and

(d) if, by 1 July 2020, the parties have not agreed in writing to extend the Term, this Contract will terminate in accordance with clause

6. Legislative Requirements

(a) The Parties must perform all of their obligations under, and otherwise comply with, all Legislative Requirements which are relevant to the performance of Service Provider's obligations under this Contract, including the documents and instruments referred to in section 1.10 of the Market Rules.

(b) A failure to perform or otherwise act in accordance with a Legislative Requirement will constitute a breach of this Contract

(c) Service Provider must:

(i) obtain and maintain all licenses, approvals, permits, consents and other authorisations required to own or operate the Service Provider Infrastructure; and

(ii) notify Water Grid Manager promptly if any license, approval, permit, consent or other authorisation required to own or operate the Service Provider Infrastructure is cancelled, forfeited, withdrawn, terminated or expires.

7. Contracted obligations

(a) Water Grid Manager may rely on the performance by Grid Participants of their obligations under other Grid Contract Documents to constitute performance by Water Grid Manager of its obligations under this Contract (including in relation to the delivery of Purified

Recycled Water into the Service Provider Infrastructure at Manufactured Water Supply Points in accordance with clause 9.2), provided that any failure by such Grid Participants to perform their obligations under such other Grid Contract Documents will not relieve Water Grid Manager from liability for its obligations under this Contract except to the extent set out in clause 19.4.

(b) Service Provider's performance of its obligations under this Contract may constitute performance by Water Grid Manager of its obligations under Grid Contract Documents with:

(i) Grid Service Providers for the supply of Declared Water Services by such Grid Service Providers; and

(ii) Grid Customers for the supply of Potable Water and Raw Water to such Grid Customers.

8. SEQ Water Entitlement

8.1 Agency

(a) Water Grid Manager appoints Service Provider as its agent (and Service Provider accepts the appointment) for the purpose of managing, releasing, delivering, taking and otherwise dealing with (for the purposes of this clause 7, dealing with) the SEQ Water Entitlement for the purpose of and in accordance with and subject to this Contract and the Market Rules.

(b) In dealing with the SEQ Water Entitlement, Service Provider must comply with the terms and conditions of the SEQ Water Entitlement, as notified by Water Grid Manager to Service Provider, Legislative Requirements and Good Operating Practice, and must not cause Water Grid Manager to breach any Legislative Requirements or any term or condition of the SEQ Water Entitlement.

(c) This agency may only be terminated in the event of termination of this Contract.

8.2 Assistance

Service Provider must:

(a) without limitation to clause 16.1, meter all Raw Water taken under the SEQ Water Entitlement from Raw Water Supply Points for which Service Provider is the Responsible Person under the Market Rules and provide such meter readings to the Water Grid Manager by the 10th Business Day of each month and without limitation to clause 16 otherwise comply with Chapter 6 of the Market Rules in respect of each Raw Water Supply Point; and

(b) provide Water Grid Manager with all other information reasonably required by Water Grid Manager in order to comply with its obligations in relation to reporting under the SEQ Water Entitlement and Legislative Requirements including to comply with the terms and conditions of any transmission licence under the Water Act.

9. Supply of Potable Water and Raw Water

9.1 Supply of Potable Water and Raw Water by Service Provider

Service Provider make available Raw Water at Raw Water Supply Points and Potable Water at Potable Water Supply Points in accordance with this Contract, the Market Rules and Approved Operating Protocols.

9.2 Supply of Manufactured Water to Service Provider

(a) Under Grid Contract Documents with Manufactured Water Providers, Water Grid Manager may, but is under no obligation to, procure the supply of Purified Recycled Water into the Service Provider Infrastructure at Manufactured Water Supply Points.

(b) Service Provider must receive Purified Recycled Water into the Service Provider Infrastructure at Manufactured Water Supply Points in accordance with this Contract, Legislative Requirements and Good Operating Practice.

(c) Water Grid Manager must use its best endeavours to ensure that Purified Recycled Water delivered to Manufactured Water Supply Points complies with the Quality Requirements.

9.3 Management of catchment areas by Service Provider

Service Provider must:

(a) use its best endeavours to manage all water catchment areas for the Service Provider Infrastructure which it owns or controls in accordance with Good Operating Practice;

(b) use reasonable endeavours to ensure the appropriate management in accordance with Good Operating Practice by others of catchment areas for the Service Provider Infrastructure which Service Provider does not own or control; and

(c) store, release, take, deliver and make available Potable Water and Raw Water in accordance with Good Operating Practice.

10. Quality

10.1 Testing and reporting

Service Provider must:

(a) test and monitor Potable Water and Raw Water in the Service Provider Infrastructure in accordance with Schedule 2, Legislative Requirements and Good Operating Practice;

(b) report the results of such testing and monitoring to Water Grid Manager in the form required by Water Grid Manager; and

(c) immediately notify Water Grid Manager (and any other affected Grid Participant) if it becomes aware of any deterioration, other than deterioration that is minor or immaterial, in the quality of Potable Water and Raw Water in the Service Provider Infrastructure or at a Bulk Supply Point.

10.2 Potable Water Quality Requirements

Service Provider must:

(a) ensure that all Potable Water made available at Potable Water Supply Points under this Contract is fit for human consumption and meets the Quality Requirements; and

(b) use its best endeavours to ensure that Potable Water made available at Potable Water Supply Points under this Contract meets the Potable Water Additional Quality Parameters.

10.3 Potable Water - Failure to meet Quality Requirements

As soon as reasonably practicable after a Party becomes aware that Potable Water made available (or to be made available) at a Bulk Supply Point does not meet (or will not meet) the Quality Requirements:

(a) that Party must notify the other Party:

(b) Water Grid Manager may issue a direction to Service Provider as to the manner in which the Potable Water which does not meet the Quality Requirements should be dealt with, and Service Provider must comply with the direction unless to do so would cause Service Provider to breach a Legislative Requirement; and

(c) Service Provider must:

(i) use its best endeavours to ensure that further Potable Water made available at Bulk Supply Points meets the Quality Requirements;

(ii) inform Water Grid Manager of the reason for the failure (or potential failure) to meet the Quality Requirements and the measures undertaken to prevent or remedy such failure; and

(iii) provide Water Grid Manager with daily updates of the reason for any continuing failure and the measures being undertaken to remedy such continuing failure.

10.4 Manufactured Water – Failure to meet Quality Requirements

As soon as reasonably practicable after a Party becomes aware that Manufactured Water made available (or to be made available) at a Manufactured Water Supply Point does not meet (or will not meet) the Quality Requirements:

(a) Water Grid Manager may issue a direction to Service Provider as to the manner in which Manufactured Water which does not meet the Quality Requirements should be dealt with, and Service Provider must comply with the direction unless to do so would cause Service Provider to breach a Legislative Requirement; and

(b) Water Grid Manager must:

(i) use its best endeavours to ensure that further Manufactured Water made available at Manufactured Water Supply Points meets the Quality Requirements;

(ii) inform Service Provider of the reason for the failure (or potential failure) to meet the Quality Requirements and the measures undertaken to prevent or remedy such failure; and

(iii) provide Service Provider with daily updates of the reason for any continuing failure and the measures being undertaken to remedy such continuing failure; and

(c) that Party must notify the other Party and the relevant Manufactured Water Provider.

10.5 Raw Water Quality

(a) Service Provider makes no representation and gives no warranty about, or in relation to the quality, suitability or fitness for any purpose of Raw Water made available under this Contract and any such representation or warranty that might be implied is hereby expressly negated.

(b) Water Grid Manager acknowledges that:

(i) there are many factors that affect Raw Water quality;

(ii) Raw Water is not fit for human consumption;

(iii) Service Provider may, in accordance with Good Operating Practice, from time to time add chemicals or other foreign matter to Raw Water made available under this Contract, and the addition of such chemicals or other foreign matter may adversely affect the quality, suitability or fitness for any purpose of the Raw Water so supplied; and

(iv) Raw Water supplied under this Contract may originate from various sources, including Purified Recycled Water, and the mixing of Raw Water from such sources may affect the quality of Raw Water made available by Service Provider.

10.6 Testing and monitoring of Raw Water

(a) Water Grid Manager must satisfy itself as to the quality, suitability or fitness for any purpose of any Raw Water made available by Service Provider to Water Grid Manager under this Contract.

(b) Water Grid Manager acknowledges that it may be necessary to treat and process Raw Water and carry out other activities to ensure that Raw Water made available under this Contract is of a quality that is suitable for the purpose for which it is intended to be used.

(c) Notwithstanding clauses 10.6(a) and 10.6(b), Service Provider must provide to Water Grid Manager any information known to Service Provider in relation to the quality, suitability or fitness for purpose of any Raw Water made available, or to be made available, under this Contract as soon as reasonably practicable:

(i) after any reasonable request by Water Grid Manager; or

(ii) after Service Provider becomes aware of any information indicating there may be a material risk of any:

(A) damage to the property of any person or the environment; or

(B) injury or harm to any individual.

10.7 Directions by authorities

Service Provider must, as soon as reasonably practicable, provide Water Grid Manager with a copy of:

(a) any direction or notice given to Service Provider under the Water Supply Act in relation to the quality or safety of Potable Water supplied to Water Grid Manager under this Contract including under sections 102, 102A, 270, 271 or 436 of that Act or under section 57A of the Public Health Act; and

(b) any correspondence which Service Provider gives in response to such direction or notice.

11. Service Provider obligations

11.1 General obligations

Service Provider must:

(a) obtain and maintain all licenses, approvals, permits, consents and other authorisations required to carry out its obligations under this Contract;

(b) comply with any reasonable request from Water Grid Manager for information which may assist Water Grid Manager to perform its obligations under the System Operating Plan, including in relation to minimising the costs and maximising the efficiency of the Water Grid;

(c) use its best endeavours to minimise, mitigate and measure water losses in the Service Provider Infrastructure, including storage losses (including evaporation and leakage), release losses, transport losses and treatment losses; and

(d) ensure that the Service Provider Infrastructure is at all times designed, constructed, operated and maintained so as to enable Service Provider to comply with all Legislative Requirements.

11.2 Opening of Wivenhoe Dam Spillway Gates

Service Provider must:

(a) if Service Provider opens one or more of the radial gates at Wivenhoe Dam for flood control purposes in accordance with any flood mitigation manual prepared by Service Provider, give notice to Water Grid Manager as soon as reasonably practicable after this has occurred; and

(b) if Service Provider has closed all of the radial gates at Wivenhoe Dam in accordance with any flood mitigation manual prepared by Service Provider, give notice to Water Grid Manager as soon as reasonably practicable after this has occurred.

12. Transfer of risk

(a) Service Provider has all risk in, and responsibility for, any Potable Water and Raw Water dealt with under this Contract from the point where Service Provider takes the water (as set out in paragraph 1 of the definition of 'water' in the Water Act) from a dam, watercourse, lake, spring or underground source.

(b) All risk in, and responsibility for:

(i) Potable Water transfers to Water Grid Manager at Potable Water Supply Points; and

(ii) Raw Water transfers to Water Grid Manager at Raw Water Supply Points.

13. Bulk Supply Points

13.1 New Bulk Supply Point

If either Party wants to designate a new Bulk Supply Point:

(a) the Party wishing to designate the new Bulk Supply Point must:

(i) notify the other Party of the proposed location of the new Bulk Supply Point; and

(ii) obtain the written consent of any Grid Participant whose Infrastructure will connect to the Service Provider Infrastructure at the new Bulk Supply Point and provide a copy of such consent to the other Party;

(b) Without limitation to clause 13.1(d), neither Service Provider or Water Grid Manager shall unreasonably withhold consent to the new Bulk Supply Point;

(c) Service Provider must use its best endeavours to agree Operating Protocols in relation to the new Bulk Supply Point with any Grid Participant whose Infrastructure will connect to the Service Provider Infrastructure at the new Bulk Supply Point; and

(d) the Operating Protocol must be approved by Water Grid Manager under and in accordance with section 3.19 of the Market Rules.

13.2 Interconnection costs

Service Provider must agree with each Connected Grid Participant on the allocation between themselves of all costs incurred in connection with the installation, operation and maintenance of all interconnection works between the Service Provider Infrastructure and any Infrastructure.

14. Infrastructure losses

Any reference in an Instruction to a volume of Potable Water and Raw Water to be:

(a) received at a Bulk Supply Point; or

(b) made available at a Bulk Supply Point;

will be deemed to represent the actual volume of Potable Water and Raw Water to be received or made available at that Bulk Supply Point, and will not include any volume of Potable Water and Raw Water to account for any system losses in any Infrastructure.

15. Maintenance

15.1 Notification by Service Provider

(a) Service Provider must:

(i) subject to clause 15.1(b) and clause 24, provide Water Grid Manager and all other Connected Grid Participants with not less than 60 days prior notice of all planned or scheduled maintenance to the Service Provider Infrastructure that may affect the performance of Service Provider's obligations under this Contract, including details of the matters to be set out in a notice given under clause 24.2(a);

(ii) to the extent reasonably practicable:

(A) comply with any reasonable request from Water Grid Manager to reschedule such activities;

(B) minimise the duration of any interruption to the performance of Service Provider's obligations under this Contract as a result of the planned or scheduled maintenance; and

(C) minimise the impact of the planned or scheduled maintenance on the quality of the Potable Water to be delivered by Service Provider under this Contract; and

(iii) use its best endeavours not to exceed the time frames specified for the planned or scheduled maintenance in the notice provided to Water Grid Manager under clause 15.1(a)(i).

(b) Without limitation to clause 15.1(a)(ii)(A), Water Grid Manager must use its reasonable endeavours to notify Service Provider of a request to reschedule any planned or scheduled maintenance notified by Service Provider under clause 15.1(a)(i) by no later than 45 days prior to the day on which Service Provider has notified that the planned or scheduled maintenance is expected to commence.

(c) The obligation of Service Provider to notify Water Grid Manager under clause 15.1(a)(i) does not apply to the extent that the planned or scheduled maintenance will only have an immaterial effect on the performance of Service Provider's obligations under this Contract.

15.2 Notification by Water Grid Manager

(a) Subject to clause 15.2(c), Water Grid Manager must notify Service Provider of all maintenance to Infrastructure that may affect the performance of Service Provider's obligations under this Contract.

(b) Water Grid Manager's notice to Service Provider under clause 15.2(a) must:

(i) include details of the matters to be set out in a notice given under clause 24.2(a) (as though Water Grid Manager were giving the notice under that clause); and

(ii) be given:

(A) in the case of any maintenance to Infrastructure that is not regularly required or anticipated to be required, as soon as reasonably practicable after the need to perform such unplanned maintenance is known by Water Grid Manager; and

(B) in the case of maintenance to Infrastructure the performance of which is required on a planned, regular or scheduled basis or is otherwise reasonably anticipated to be required to ensure the continuous and proper functioning of the Infrastructure, as soon as reasonably practicable but in any event no later than 45 days prior to the anticipated commencement of the maintenance.

(c) The obligation of Water Grid Manager to notify Service Provider under clause 15.2(a) does not apply to the extent that the maintenance will have an immaterial effect on the performance of Service Provider's obligations under this Contract.

16. Metering

16.1 Responsibility for metering

(a) Service Provider must obtain Meter Data in accordance with Chapter 6 of the Market Rules for all Bulk Supply Points for which Service Provider is the Responsible Person under the Market Rules.

(b) Water Grid Manager must:

(i) obtain meter readings in respect of Potable Water and Raw Water supplied to a Bulk Supply Point for which Service Provider is not the Responsible Person under the Market Rules for each calendar month and provide those meter readings to Service Provider by no later than the 10th Business Day of the following calendar month; and

(ii) provide reasonable assistance to Service Provider in carrying out its obligations under clause 16.2(a), including by assisting through using Water Grid Manager's best endeavours to procure meter readings in relation to meters located outside the Service Provider Infrastructure.

(c) The Parties acknowledge and agree that the volume of Raw Water supplied to Bulk Supply Points for CS Energy Limited and Tarong Energy Corporation Limited will be determined in accordance with Schedule 6.

16.2 Metering results

(a) Without limitation to the obligations of Service Provider under Chapter 6 of the Market Rules, Service Provider must, in connection with each invoice issued to Water Grid

Manager under clause 17.2, provide Water Grid Manager with the Meter Data and other data used to:

(i) determine the actual volumes of Potable Water and Raw Water; and

(ii) calculate any estimated volumes of Potable Water and Raw Water in accordance with the Alternate Methodology published pursuant to section 6.4 of the Market Rules,

made available at Bulk Supply Points during the preceding calendar month.

(b) Service Provider's obligations under clause 16.2(a) to provide Water Grid Manager with any Meter Data relating to Potable Water and Raw Water supplied to any Bulk Supply Point for which Service Provider is not the Responsible Person under the Market Rules, shall be subject to Service Provider's receipt of meter readings and all other relevant data from Water Grid Manager.

16.3 Invoice adjustment for inaccurate or failed Metering Installations

(a) Service Provider must:

(i) notify Water Grid Manager as soon as reasonably practicable if a Metering Installation or Transitional Metering Installation is found to be inaccurate, whether as a result of any calibration or verification testing performed by Service Provider pursuant to the Market Rules or any other applicable Legislative Requirements or otherwise; and

(ii) use the Alternate Methodology in the circumstances contemplated by section 6.24 of the Market Rules.

(b) If an invoice issued by Service Provider under clause 17.2 was prepared on the basis of metering results from an inaccurate or failed Metering Installation or Transitional Metering Installation, any overpayment or underpayment made on the basis of such invoice will be corrected by making a corresponding adjustment to the next invoice issued in accordance with clause 17.2 after the overpayment or underpayment is discovered.

17. Grid Service Charges

17.1 Payment obligations

Water Grid Manager must, upon receipt of an invoice from Service Provider in accordance with clause 17.2, pay (monthly in arrears and in accordance with clause 17.3) the Grid Service Charges for each calendar month during the Term.

17.2 Monthly invoices

(a) Within 15 Business Days of the end of each calendar month during the Term, Service Provider must issue an invoice to Water Grid Manager specifying:

(i) the Grid Service Charges for the calendar month;

(ii) any other amounts (including overdue payments) payable by Water Grid Manager to Service Provider in accordance with this Contract;

(iii) any adjustments made pursuant to clause 16.3(b);

(iv) the volume of Potable Water delivered by Service Provider to each Bulk Supply Point, or where the Alternate Methodology applies, the estimated total volume of

Potable Water supplied to a Bulk Supply Point, during the previous calendar month metered or estimated in accordance with clause 16.2; and

(v) the account to which payment must be made.

(b) Each invoice issued by Service Provider to Water Grid Manager must be accompanied by such supporting documentation as may reasonably be required by Water Grid Manager to verify the invoice.

17.3 Payment terms

Subject to clause 17.4, Water Grid Manager must pay Service Provider the amount stated in an invoice issued pursuant to clause 17.2 within 20 Business Days of Water Grid Manager's receipt of the invoice or the determination of a dispute in respect of the invoice under clause 17.4.

17.4 Payment disputes

(a) If Water Grid Manager disputes all or any part of an invoice it must:

(i) pay that part of the invoice not in dispute; and

(ii) provide a detailed statement of its grounds for disputing all or any part of an invoice (with such reasonable supporting details as may be required to substantiate such grounds) to Service Provider,

by the due date for payment of that invoice under clause 17.3.

(b) Payment of all or any part of an invoice does not prejudice the Water Grid Manager's right to dispute all or any part of such invoice.

(c) If the dispute cannot be resolved between the Parties within 10 Business Days of Service Provider's receipt of Water Grid Manager's statement of its grounds for disputing the invoice, the dispute must be determined in accordance with Chapter 9 of the Market Rules.

17.5 Continued performance

Subject to the terms and conditions of this Contract (including clause 21), each Party must continue to perform its obligations under this Contract notwithstanding any dispute between the Parties relating to an invoice issued in accordance with this clause 17 or any amount owing in accordance with this Contract.

17.6 Interest on overdue sums

Interest on overdue sums (including any overdue sum that was subject to a dispute resolved in favour of Service Provider) will be payable at the Default Rate and such interest will accrue from the due date for payment in accordance with clause 17.3 until the date of payment.

17.7 Prudential Requirements and Security

Water Grid Manager must comply with section 2.23 of the Market Rules and acknowledges that Service Provider may have recourse to any Security provided by Water Grid Manager if Water Grid Manager fails to perform its obligations under this clause 17.

18. GST

18.1 Interpretation

In this clause 18, words or expressions have the same meaning as defined in the *A New Tax System (Goods and Services Tax) Act 1999* (Cth), unless the context makes it clear that a different meaning is intended.

18.2 GST gross up

If a Party makes a supply under or in connection with this Contract in respect of which GST is payable, the consideration for the supply but for the application of this clause 18 (**GST Exclusive Consideration**) is increased by an amount equal to the GST Exclusive Consideration multiplied by the rate of GST prevailing at the time the supply is made.

18.3 Reimbursements

If a Party must reimburse or indemnify another Party for a loss, cost or expense, the amount to be reimbursed or indemnified is first reduced by any input tax credit to which the other Party is entitled for the loss, cost or expense and then increased in accordance with clause 18.2. That Party is assumed to be entitled to a full input tax credit unless it proves, before the date on which the payment must be paid, that its entitlement is otherwise.

18.4 Tax invoices

Notwithstanding any other provision of this Contract, the recipient of a taxable supply made under or in connection with this Contract need not make a payment until the supplier has given the recipient a tax invoice for the supply to which the payment relates. The supplier must give the recipient an adjustment note for an adjustment arising from an adjustment event relating to a taxable supply made under or in connection with this Contract within 5 Business Days after the date the supplier becomes aware of the adjustment event.

18.5 GST group

If a Party is a member of a GST group, references to GST which the Party must pay, and to input tax credits to which the Party is entitled, include GST which the representative member of the GST group must pay and input tax credits to which the representative member is entitled.

18.6 Indemnities

If a payment under an indemnity gives rise to a liability to pay GST, the payer must pay and indemnify the payee against the amount of that GST.

19. Indemnity and liability

19.1 Indemnity of Service Provider

(a) Subject to clause 19.4, Water Grid Manager must indemnify Service Provider for all costs, charges, expenses, losses or damages incurred by Service Provider that result, directly or indirectly, from a failure by a Connected Grid Participant to perform the obligations of the Connected Grid Participant under an Approved Operating Protocol.

(b) The indemnity in clause 19.1(a) does not vary or exclude the operation of section 360ZDI(1) of the Water Act.

19.2 Indemnity of Water Grid Manager

Service Provider must indemnify Water Grid Manager and each of its board members, directors, officers, employees, agents, contractors and other representatives for all costs (including legal costs), charges, expenses, losses or damages incurred by or awarded against each of those persons as a direct or indirect result of:

(a) any breach of this Contract by Service Provider, including any breach of an Approved Operating Protocol and any breach in respect of which Water Grid Manager exercises an express right to suspend the payment of all or any amount due and payable under this Contract under clause 21.2; or

(b) any loss of or damage to any property (including the environment) or injury to or death of any person caused or contributed to by any negligent or unlawful act or omission or any wilful misconduct of:

(i) Service Provider; or

(ii) any of Service Provider's board members, directors, officers, employees, agents, contractors or other representatives to the extent that Service Provider is vicariously liable for the negligent or unlawful act or omission or wilful misconduct of any such person, or the negligent or unlawful act or omission or wilful misconduct of any such person was carried out in the course of their employment by Service Provider or the performance by the person of their responsibilities to Service Provider,

whether arising as a result of any Claim brought by Service Provider or a third party, or otherwise.

19.3 Exclusions

Service Provider's obligation to indemnify Water Grid Manager and each of its board members, directors, officers, employees, agents, contractors and other representatives under clause 19.2 will be reduced proportionately to the extent that any breach of this Contract by Water Grid Manager, or any negligent or unlawful act or omission or wilful misconduct of:

(a) Water Grid Manager; or

(b) any of Water Grid Manager's board members, directors, officers, employees, agents, contractors or other representatives to the extent that Water Grid Manager is vicariously liable for the negligent or unlawful act or omission or wilful misconduct of any such person, or the negligent or unlawful act or omission or wilful misconduct of any such person was carried out in the course of their employment by Water Grid Manager or the performance by the person of their responsibilities to Water Grid Manager,

has contributed to the costs, expenses, losses or damages incurred by or awarded against such persons.

19.4 Liability of Water Grid Manager

(a) Subject to clause 19.4(b), the total, aggregate liability of Water Grid Manager to Service Provider (including for a breach of Water Grid Manager's obligations under this Contract) for any costs, expenses, losses or damages (**Losses**) sustained or incurred by Service Provider as a result of:

(i) any breach of a Grid Contract Document; or

(ii) any negligent or unlawful act or omission or wilful misconduct (including a breach of the Market Rules),

by any Grid Participant or Grid Participants on whom Water Grid Manager relied to perform Water Grid Manager's obligations under this Contract pursuant to clause 7(a) is limited to an amount equal to the Pass Through Limit.

For the purposes of this clause 19.4, the **Pass Through Limit** is the amount that Water Grid Manager recovers from such Grid Participant or Grid Participants in connection with the relevant breach, act or omission or wilful misconduct by any Grid Participant or Grid Participants (less Water Grid Manager's costs of such recovery) provided such amount is limited to the extent that the recovered amount relates to the Losses sustained or incurred by Service Provider in connection with the relevant breach, act or omission by such Grid Participant or Grid Participants.

(b) Water Grid Manager must:

(i) use its best endeavours to enforce each Grid Contract Document on which it relies to perform its obligations under this Contract (**Relevant Grid Contract Document**); and

(ii) subject to clause 19.4(c), not waive a breach by a Grid Participant of any obligations under a Relevant Grid Contract Document where such breach may result in Water Grid Manager being unable to perform its obligations under this Contract without first obtaining the written consent of Service Provider, which consent must not be unreasonably withheld.

(c) It will not be necessary for Water Grid Manager to seek the consent of Service Provider under clause 19.4(b)(ii) in circumstances where the relevant breach is minor or immaterial.

19.5 Survival of indemnity

This clause 19 will survive the termination or expiry of this Contract.

20. Insurance

20.1 Water Grid Manager insurances

Water Grid Manager must effect and keep current at all times during the Term (and, in the case of policies that insure on a 'claims made' basis, for a period of 7 years thereafter), such policies of insurance as an entity carrying out activities similar to those carried out by Water Grid Manager would effect, acting reasonably, including (to the extent they are available to Water Grid Manager on commercially reasonable terms):

(a) professional indemnity insurance; and

(b) public liability cover.

20.2 Service Provider insurances

(a) Service Provider must effect and keep current at all times during the Term (and, in the case of policies that insure on a 'claims made' basis, for a period of 7 years thereafter) such policies of insurance as an entity carrying out activities similar to those carried out by Service Provider would effect, acting reasonably, including (to the extent they are available to Service Provider on commercially reasonable terms):

(i) professional indemnity insurance;

(ii) public and products liability cover; and

(iii) industrial special risks cover.

(b) Service Provider must use its reasonable endeavours to accommodate any reasonable request by another Grid Participant to be named as an additional or co-insured on any policy of insurance carried by Service Provider, provided the requesting Grid Participant:

(i) has an insurable interest in the subject matter of the applicable policy of insurance; and

(ii) agrees to pay Service Provider an amount equal to the increase in the amount of any premiums payable under the relevant policy of insurance, on terms reasonably acceptable to Service Provider.

20.3 Evidence of insurance

Service Provider must provide Water Grid Manager with copies of the policies of insurance or certificates evidencing the currency of the policies of insurance that Service Provider is required to maintain in accordance with clause 20.2:

(a) by no later than 30 September of each year during the Term; and

(b) within 30 days of receiving a written request from Water Grid Manager at any other time (including in the case of policies that insure on a 'claims made' basis, during the 7 years after the Term).

20.4 Changes to insurances

Service Provider must promptly notify Water Grid Manager if, at any time during the Term (and, in the case of policies that insure on a 'claims made' basis, for a period of 7 years thereafter), any policy of insurance Service Provider holds in accordance with clause 20.2 is cancelled or found to be void *ab initio* or there is any material change to the terms of such policy.

21. Default

21.1 Event of Default

If Service Provider fails to perform or comply with any of its obligations under this Contract (**Event of Default**), Water Grid Manager may serve a notice on Service Provider specifying the Event of Default and the time within which Service Provider must remedy the Event of Default (if the Event of Default is capable of being remedied) or take all reasonable steps to prevent the recurrence of the Event of Default (if the Event of Default is not capable of being remedied) which time must not be less than 10 Business Days after the date that the notice is given to Service Provider by Water Grid Manager.

21.2 Suspension of payment by Water Grid Manager

If, within the time specified in a notice given by Water Grid Manager under clause 21.1, Service Provider fails to:

(a) take all reasonable steps to prevent the recurrence of an Event of Default that is not capable of remedy;

(b) remedy any Event of Default that is capable of being remedied to the satisfaction of Water Grid Manager; or

(c) provide satisfactory assurance to Water Grid Manager that any Event of Default that is capable of being remedied will be remedied as soon as reasonably practicable,

then Water Grid Manager may immediately suspend payment of all moneys otherwise due and payable under this Contract to Service Provider until such time as Service Provider has remedied the Event of Default or taken all reasonable steps to prevent the recurrence of an Event of Default that is not capable of remedy.

21.1 Continued performance

Subject to this clause 21, notwithstanding an Event of Default or a failure by Water Grid Manager to comply with its obligation to pay an amount due and payable to Service Provider under this Contract, each of the Parties must continue to perform its obligations under this Contract and the Market Rules.

21.2 Remedies not exclusive

The exercise by Water Grid Manager of its rights and remedies under this clause 21 are without limitation to any other rights or remedies available to Water Grid Manager in respect of any Event of Default.

22. Water supply emergencies

The obligations under this Contract will be suspended to the extent they are inconsistent with an emergency declaration or emergency regulation made by the Minister under the Water Act which is applicable to the Parties, but only to the extent of the inconsistency and only for the duration of the emergency declaration or emergency regulation.

23. Forecasted interruptions

Without limitation to clauses 15.1 and 24, not less than once in each Quarter, Service Provider must notify Water Grid Manager and all other affected Grid Participants of any reasonably anticipated and material:

(a) shortfall in the amount of Potable Water and Raw Water available to be supplied; or

(b) interruptions to the supply of Potable Water and Raw Water,

to any Bulk Supply Point.

24. Permitted interruptions

24.1 Service Provider permitted interruptions

Subject to clause 24.2, Service Provider may, without incurring liability to Water Grid Manager, interrupt or curtail the taking and delivery of Potable Water and Raw Water under this Contract:

(a) to comply with any emergency declaration or emergency regulation, as described in clause 22;

(b) to accommodate the performance of planned or scheduled maintenance to the Service Provider Infrastructure, provided such maintenance has been notified to Water Grid Manager within the time specified in clause 15.1(a)(i);

(c) to prevent or minimise actual or imminent damage to the property of any person;

(d) to avoid actual or imminent injury or harm to any individual;

(e) to comply with any Legislative Requirement;

(f) where such interruption or curtailment results from any non-performance or failure to perform by another Grid Participant of an obligation under a Grid Contract Document or the Market Rules, provided that Grid Participant's non-performance or failure to perform is permitted or excused under the applicable Grid Contract Document or the Market Rules; or

(g) in order to comply with the terms and conditions of the SEQ Water Entitlement to the extent that such requirement to interrupt or curtail the supply is not due to any breach of, or failure to perform an obligation under, this Contract or the Market Rules by Service Provider.

24.2 Service Provider obligations

(a) Service Provider must notify Water Grid Manager as soon as reasonably practicable after Service Provider determines to interrupt or curtail the supply of Potable Water and Raw Water under clause 24.1 or, in the case of interruption or curtailment under clause 24.1(f), becomes aware that supply has been curtailed or interrupted, giving particulars of:

(i) the reason for the interruption or curtailment;

(ii) the date and time of commencement of the interruption or curtailment;

(iii) the expected duration of the interruption or curtailment; and

(iv) any measures Service Provider has taken or will take to mitigate the effect of the interruption or curtailment.

(b) Except in the case of an interruption or curtailment under clause 24.1(b), Service Provider will have fulfilled its obligation under clause 24.2(a) where the notice to be given by Service Provider to Water Grid Manager under that clause was given after the interruption or curtailment had commenced, provided that it was not reasonably practicable for Service Provider to have given notice at an earlier time.

(c) Service Provider must, to the extent reasonably practicable, minimise the period of any interruption or curtailment under clause 24.1 and resume such supply as expeditiously as possible after the event or circumstance giving rise to the interruption or curtailment has ceased or abated to an extent which permits the resumption of such supply.

25. Force Majeure

25.1 Notification and diligence

A Party that is, by reason of Force Majeure, unable to perform any obligation under this Contract (**Affected Party**) must:

(a) notify the other Party in writing as soon as reasonably practicable after becoming aware of the Force Majeure giving particulars of the event or circumstance of Force Majeure (known at the time of giving notice) including:

(i) the date of commencement of the Force Majeure;

(ii) details of the Force Majeure;

(iii) the obligations which the Affected Party is unable to perform, whether in whole or in part;

(iv) the expected duration of the delay arising as a result of the Force Majeure;

(v) details of the action the Affected Party has taken and proposes to take to remedy, abate or mitigate the effects of the Force Majeure; and

(vi) an estimate of the period of time required to enable it to resume full performance of its obligations;

(b) use its best endeavours to remedy, abate or mitigate the effects of the Force Majeure as expeditiously as possible; and

(c) resume performance as expeditiously as possible after the Force Majeure has abated to an extent which permits resumption of performance, and notify the other Party immediately when resumption of performance has occurred.

25.2 Non-performance excused

(a) Any failure by an Affected Party to perform an obligation under this Contract will, to the extent that such performance is precluded, wholly or in part, by Force Majeure:

(i) be excused;

(ii) not give rise to any liability to the other Party, including for later performance of the obligation, the performance of which was precluded by the Force Majeure; and

(iii) be deemed not to result in a breach of this Contract, or (in the case of Service Provider) an Event of Default.

(b) An Affected Party must, to the extent possible notwithstanding the Force Majeure, continue to comply with all of its other obligations under this Contract.

(c) Nothing in this clause 25 will relieve a Party that is not affected by Force Majeure from performing its obligations under this Contract unless and to the extent such performance is precluded by the failure of an Affected Party to perform its obligations under this Contract.

25.3 Payment obligations

An event or circumstance of Force Majeure does not relieve either Party from any payment obligation under this Contract.

26. Dispute resolution

26.1 Disputes to be resolved in accordance with the Market Rules

Subject to clause 17.4, any dispute between the Parties arising under or in connection with this Contract or the Market Rules must be resolved in accordance with Chapter 9 of the Market Rules.

26.2 Disputes with Grid Participants

All disputes among Grid Participants, whether arising under or in connection with the Market Rules or the Approved Operating Protocols must be resolved in accordance with Chapter 9 of the Market Rules.

26.3 Continued performance of obligations

Notwithstanding the existence of a dispute, each Party must continue to perform its obligations under this Contract and the Market Rules.

27. Access rights

(a) Subject to clause 27(b), Water Grid Manager may from time to time during the Term request, on its own behalf and on behalf of any Connected Grid Participant, that Service Provider grant Water Grid Manager and any such Connected Grid Participant access to the land owned or otherwise controlled by Service Provider (**Controlled Area**) as may be necessary to:

(i) install interconnection works for a new Bulk Supply Point designated pursuant to clause 13;

(ii) establish any required connections between the Service Provider Infrastructure and any Infrastructure;

(iii) comply with this Contract or Legislative Requirements;

(iv) monitor performance by Service Provider of its obligations under this Contract;

(v) install or maintain any interconnection works at Bulk Supply Points;

(vi) install, operate and maintain any metering or monitoring equipment necessary to meter the quantity, or monitor the quality, of Potable Water and Raw Water to be supplied in accordance with this Contract, any other Grid Contract Document, the Market Rules or any Approved Operating Protocol;

(vii) test any Metering Installation or Transitional Metering Installation in accordance with section 6.19 of the Market Rules; and

(viii) in the case of Water Grid Manager:

(A) comply with Water Grid Manager's obligations under this Contract, any other Grid Contract Document, the Market Rules or any other Legislative Requirements; and

(B) monitor performance by any Grid Participant of their obligations under any Grid Contract Documents,

which requests must not be unreasonably denied by Service Provider, but may be granted subject to such conditions as are reasonable in the circumstances.

(b) If any consent or authorisation is required to be obtained to permit Water Grid Manager or any Connected Grid Participant to gain access to a Controlled Area that is not owned by Service Provider for the purposes described in clause 27(a):

(i) Service Provider must use its reasonable endeavours to procure all such required consents or authorisation from the relevant landowner, Government Instrumentality or other person; and

(ii) Water Grid Manager must provide such assistance and information, complete such forms and comply with all such directions and procedures as may reasonably be required by Service Provider or the relevant landowner, Government Instrumentality or other person to obtain the required consents or authorisations, and ensure that any other Grid Participant who requires access do the same.

(c) Water Grid Manager must ensure that any board member, director, officer, employee, agent, contractor or other representative of Water Grid Manager or of any contractor of Water Grid Manager, including any Connected Grid Participant, who accesses a Controlled Area in accordance with this clause 27 complies with all applicable Legislative Requirements, Service Provider's access policies and induction requirements, and all reasonable directions of Service Provider, and causes as little interference and disruption to the operation of the Service Provider Infrastructure or the operations on the third party land as is reasonably practicable having regard to the purpose of such person or persons in entering the Controlled Area.

(d) Water Grid Manager must use its best endeavours to procure access to any land owned or otherwise controlled by any Connected Grid Participant (**Connected Grid Participant Controlled Area**) as may be required by Service Provider for any of the purposes set out in clauses 27(a)(i) to 27(a)(vii).

(e) A Party who is granted access to any Controlled Area or Connected Grid Participant Controlled Area must, as soon as reasonably practicable, remedy any damage to Infrastructure or any other property (whether belonging to Service Provider, Water Grid Manager, a Connected Grid Participant or any other third party) located on or within the Controlled Area or the Connected Grid Participant Controlled Area caused by:

(i) in the case of Water Grid Manager:

(A) Water Grid Manager or any board member, director, officer, employee, agent, contractor or other representative of Water Grid Manager or of any contractor of Water Grid Manager: and

(B) any Connected Grid Participant or any board member, director, officer, employee; agent, contractor or any other representative of any Connected Grid Participant or of any contractor of Connected Grid Participant; and

(ii) in the case of Service Provider, Service Provider or any board member, director, officer, employee, agent, contractor or other representative of Service Provider or of any contractor of Service Provider.

28. Information sharing

(a) Subject to clauses 28(b) and 28(c), each Party must provide the other with any information reasonably required to assist the other Party with:

(i) infrastructure planning;

(ii) short and medium term water balance modelling and formulation of Grid Instructions;

(iii) the development of operation and maintenance, water quality, incident and risk management plans, protocols and policies; and

(iv) compliance with, or demonstrating compliance with, Legislative Requirements.

(b) Clause 28(a) does not apply to any information:

(i) that a Party, in its sole discretion, considers to be commercially sensitive;

(ii) that is subject to a legally recognised form of professional privilege; or

(iii) in respect of which an obligation of confidentiality is owed to a third party.

(c) The confidentiality obligations set out sections 11.1, 11.2 and 11.3 of the Market Rules apply to all Confidential Information exchanged between the Parties in connection with this Contract as though such obligations were set out in this Contract with any necessary modifications to ensure consistency with this Contract.

(d) In addition to the exceptions to confidentiality set out in section 11.3 of the Market Rules, the Parties may disclose Confidential Information to their contractors, subcontractors, agents and other representatives, provided the Party to whom Confidential Information is disclosed has a need to know the Confidential Information and the Party making disclosure informs the proposed recipient of the confidentiality of the information and takes appropriate precautions to ensure the proposed recipient keeps the information confidential and does not use the information for any purpose other than the purpose for which it is disclosed.

29. Subcontracting

(a) Subject to clause 29(b), Service Provider must not enter into a contract or other arrangement with another person in relation to:

(i) the operation and maintenance of the Service Provider Infrastructure;

(ii) the performance of any of Service Provider's obligations under this Contract in relation to quality management, testing or monitoring of the quality of Potable Water; or

(iii) the performance of any of Service Provider's obligations under this Contract in relation to metering,

without the prior written consent of Water Grid Manager which consent must not be unreasonably withheld or delayed but which may be given subject to any reasonable conditions.

(b) Service Provider is not required to obtain Water Grid Manager's consent to a contract or other arrangement relating to the operation and maintenance of the Service Provider Infrastructure if the total amount payable by Service Provider under the contract or other arrangement each year is less than five per cent of Service Provider's operation and maintenance budget for the corresponding year.

(c) Service Provider is responsible for the performance of all of its obligations under this Contract and remains liable for any failure to comply with its obligations under this Contract despite entry into a contract or other arrangement with another person.

30. Nature of relationship

(a) This Contract is not intended to create nor will it be construed as creating any legal partnership, joint venture or fiduciary relationship between the Parties and it will not give rise to any obligations between the Parties apart from those obligations expressly stated in this Contract or imposed by Legislative Requirements. Without limitation, the provisions of this Contract do not give rise to joint and several liability between the Parties.

(b) Each of the Parties is an independent entity, and for the purposes of this Contract, the board members, directors, officers employees, agents, subcontractors or other representatives of each of the Parties will not be regarded as board members, directors, officers, employees, agents, subcontractors or other representatives of another Party, unless deemed otherwise by law.

31. Notices

Section 11.7 of the Market Rules will apply to all communications (including all notices, consents, approvals, requests and demands) given under or in connection with this Contract, as though that section was set out in this Contract with any necessary modifications to ensure consistency with this Contract.

32. Miscellaneous provisions

32.1 Assignment

Service Provider and Water Grid Manager must not assign or transfer and must not purport to assign or transfer any of their respective rights or obligations under this Contract.

32.2 Governing law

This Contract is to be governed by and construed in accordance with the laws of the State of Queensland and each Party irrevocably and unconditionally submits to the exclusive jurisdiction of the courts of Queensland.

32.3 Entire agreement

This Contract constitutes the entire agreement between the Parties with respect to the subject matter of this Contract and supersedes all previous communications, representations, inducements, undertakings, agreements or arrangements between the Parties.

32.4 Joint and several liability

If a Party comprises two or more persons, the provisions of this Contract binding that Party bind those persons jointly and severally.

32.5 Survival after termination

The termination of this Contract will not affect any terms of this Contract that expressly provide that they will operate after termination or expiry of this Contract or which of necessity must continue to have effect after termination or expiry of this Contract, notwithstanding that the clauses themselves do not expressly provide for this.

32.6 No waiver

A person does not waive its rights, powers or discretions (for the purpose of this clause, '**rights**') under this Contract by:

(a) failing to exercise its rights;

(b) only exercising part of its rights; or

(c) delaying the exercise of its rights.

32.7 Severability

Part or all of any provision of this Contract that is illegal or unenforceable may be severed from this Contract and the remaining provisions of this Contract will continue in force.

32.8 Amendments prior to 1 July 2011

(a) Subject to clause 32.8(b), this Contract may only be amended by the Minister prior to 1 July 2011.

(b) Notwithstanding clause 32.8(a), the Parties may amend any of Schedule 2, Schedule 3, Schedule 4, Schedule 5 or Schedule 6, provided that:

(i) the Parties agree in writing on the form of any amendment to be made to such Schedules; and

(ii) the form of each amendment is notified to the Rules Administrator,

in which case the amendments will take effect from the date that notice is given to the Rules Administrator under this clause 32.8(b).

(c) Service Provider must ensure that any amendments required to be made to the Approved Operating Protocol as a result of an amendment made to any of Schedule 2, Schedule 3, Schedule 4, Schedule 5 or Schedule 6, under this clause 32.8 are made and approved in accordance with the Market Rules.

32.9 Amendment from 1 July 2011

From 1 July 2011, the Parties may amend this Contract only in accordance with the Water Act.

Schedule 1 – Definitions

Capitalised terms used in this Contract have the meaning specified below. Capitalised terms used and not defined in this Contract have the meaning specified in Market Rules.

ADWG Specifications means the requirements set out in Schedule 2.

Affected Party has the meaning specified in clause 25.1.

Claim means any and all causes of action, claims, demands, or proceedings of any nature arising or commenced in any jurisdiction, whether in tort (including negligence), in equity, for breach of contract, for legal costs or interest, or otherwise.

Commencement Date means 1 July 2010.

Connected Grid Participant means any Grid Participant whose Infrastructure connects with the Service Provider Infrastructure.

Connected Grid Participant Controlled Area has the meaning specified in clause 27(d).

Contract means this Grid Contract Document, including all Appendices and Schedules attached to and forming part of this Grid Contract Document, and any reference to the obligations of a Party under this Contract is a reference to the obligations of that Party in each Appendix and Schedule of this Contract.

Controlled Area has the meaning specified in clause 27(a).

Default Rate means the interest rate applicable to debt funding arrangements between Service Provider and Queensland Treasury Corporation, plus 2%.

Directive means any present or future requirement, instruction, direction or order of a Government Instrumentality that is legally issued and binding on either Party (as applicable) or otherwise applies in respect of the Water Grid, and any modification, extension or replacement thereof from time to time in force.

Event of Default has the meaning specified in clause 21.1.

Expiry Date means 30 June 2020.

Force Majeure means, in respect of a Party, any event or circumstance or combination of events or circumstances outside that Party's reasonable control, including:

(a) a lack of available supply of power, water or other essential equipment, goods, supplies or services;

(b) acts of God, including without limitation, droughts, earthquakes, floods, wash outs, landslides, lightning, storms or natural disasters;

(c) fires or explosions;

(d) epidemics, pandemics or quarantines;

(e) strikes, lockouts, bans, slowdowns or other industrial disturbances (other than of a localised or entity-specific nature);

(f) any order of any court or the order, law, rule, regulation, act or omission of any Government Instrumentality having jurisdiction or any failure to obtain any necessary consent or approval of any Government Instrumentality;

(g) any accident, breakages or accident to machinery, pipelines or other infrastructure or equipment, the necessity for making repairs and/or alterations in machinery, pipelines or other infrastructure or equipment, freezing of reservoirs, catchments or pipelines;

(h) terrorism, acts of a public enemy, war (declared or undeclared), blockades, revolution, insurrection, rebellion, riots, sabotage, invasion, rebellion, political disturbance or civil disturbance;

(i) the failure of a Grid Service Provider, a Distribution Service Provider or Grid Customer to perform an obligation under a Grid Contract Document or the Market Rules where the Grid Service Provider, Distribution Service Provider or Grid Customer's failure to perform is permitted or excused by the terms of the applicable Grid Contract Document or the Market Rules; or

(j) the effects of any of the foregoing events or circumstances that continue after the cessation of the relevant event or circumstance,

which, by taking due care and proper precautions, or by using reasonable alternative measures, that Party is not reasonably able to prevent or overcome.

Government Instrumentality means any federal, state or local government or any ministry, department, court, commission, agency, institution or similar entity of any such government.

Grid Participant means a Grid Service Provider (other than Service Provider), Distribution Service Provider or Grid Customer.

GST Exclusive Consideration has the meaning specified in clause 18.2

Instruction means any Grid Instruction, Operating Instruction or Emergency Operating Instruction.

Legislative Requirements means:

(a) any statute, regulation, by-law, ordinance or statutory instrument of the Commonwealth of Australia or the State of Queensland;

(b) any ordinances, orders, awards, statutes, proclamations, codes, standards or legally issued and binding guidelines of any Government Instrumentality with jurisdiction over the Parties or the subject matter of this Contract;

(c) any terms or conditions of any licences, approvals, permits, consents or authorisations issued by a Government Instrumentality to either Party; and

(d) any Directive,

whether in existence at the date of this Contract or coming into existence after that date.

Losses has the meaning specified in clause 19.4(a).

Market Rules means the South East Queensland Water Market Rules made by the Minister under section 360ZC'X of the Water Act.

Parties means, collectively, Water Grid Manager and Service Provider and Party means either of them.

Potable Water Additional Quality Parameters means the additional quality requirements set out in Schedule 3.

Potable Water Supply Point means a Bulk Supply Point for Potable Water identified in Schedule 5.

PRW Quality Requirements means the Manufactured Water quality specifications set out in Schedule 4.

PRW Supply Point means a Bulk Supply Point for Manufactured Water identified in Schedule 5.

Quality Requirements means:

(a) any water quality requirements set out in Legislative Requirements, including in respect of Potable Water, any approved Drinking Water Quality Management Plan and in respect of Purified Recycled Water, any approved recycled water management plan (as defined in the Water Act); and

(b) in respect of Potable Water, the ADWG Specifications; and

(c) in respect of Purified Recycled Water, the PRW Quality Requirements.

Quarter means a period of 3 calendar months commencing on each 1 January, 1 April, 1 July and 1 October during the Term.

Raw Water Meter means a meter located at a Raw Water Supply Point.

Raw Water Supply Point means a Bulk Supply Point for Raw Water identified in Schedule 5.

Relevant Grid Contract Document has the meaning specified in clause 19.4(b)(i).

Relevant Meter means a meter that is used to measure the flow of water through a Bulk Supply Point that has not yet been assessed in accordance with section 6.7 of the Market Rules.

SEQ Water Entitlement means the various water allocations, water licences and interim water allocations held by Water Grid Manager under the Water Act.

Service Provider Infrastructure means Infrastructure owned or controlled by Service Provider.

Term has the meaning specified in clause 4(c).

Schedule 2 – ADWG Specifications

Compliance with the Australian Drinking Water Guidelines 2004 developed by the National Health and Medical Research Council in collaboration with the Natural Resource Management Ministerial Council as amended from time to time.

Schedule 3 – Potable Water Additional Quality Parameters

In accordance with clause 10.2(b) of Appendix A, Service Provider must use its best endeavours to ensure that Potable Water supplied to Water Grid Manager under this Contract meets the Potable Water Additional Quality Parameters set out in the tables below:

In relation to Potable Water supplied from the Mount Crosby or North Pine Water Treatment Plants:

Additional Quality Parameters	Limit
Aluminium	0.2 mg/L
True Colour	5
Copper	1 mg/L
Iron	0.1 mg/L
Manganese	0.1 mg/L
Monochloramine (measured as mg Cl as Cl2/L)	4.1 mg/L
pH	6.5 – 8.5 pH
Temperature	35°C
Total Hardness	200 mg/L
Total THMs	<25 mg/L
Turbidity	2 NTU

NTU = nephelometric unbidity

In relation to Potable Water supplied from the Molendinar or Mudgeeraba Water Treatment Plants:

Additional Quality Parameters	Limit
E.Coli	< 1 CFU/100ml
Total Coliforms	< 1 CFU/100ml
Heterotrophic Plate Count	<100 CFU/ml
Turbidity	<1.0 NTU
True Colour	<5 HU
pH	7.0 – 8.0
Free Chlorine	>or = 0.2 mg/L & < 1.5 mg/L
Manganese (Total)	< 0.05 mg/L
Aluminium (Acid Soluble)	<0.2 mg/L

Alkalinity (as CaCO3)	≥35 mg/L

In relation to Potable Water supplied from the Landershute Water Treatment Plant, Noosa Water Treatment Plant, Image Flat Water Treatment Plant, Kenilworth Water Treatment Plant Noosaville Council Works Depot or Maleny Water Treatment Plant:

Additional Quality Parameters			
Parameter	**Units**	**RPM[1]**	**Limiting Value**
Additional Quality Parameters for Noosa Water Treatment Plant			
Aluminium	mg/L	≤0.05@95th percentile	0.20
Bromate	mg/L	n/a	0.02
Colour	Co-Pt	≤5@95th percentile	8
Iron (total)	mg/L	n/a	0.05
Manganese (total)	mg/L	≤0.01@95th percentile	0.02
Particles (3-12µm)[2]	particles/mL	n/a	100
Trihalomethanes	mg/L	n/a	0.20
Turbidity	NTU	≤0.30@95th percentile	0.50
Additional Quality Parameters for Image Flat Water Treatment Plant			
Aluminium	mg/L	≤0.05@95th percentile	0.20
Colour	Co-Pt	≤5@95th percentile	8
Iron (total)	mg/L	n/a	0.05
Manganese (total)	mg/L	≤0.01@95th percentile	0.02
Turbidity	NTU	≤0.30@95th percentile	0.50
Additional Quality Parameters for Kenilworth Water Treatment Plant			
Aluminium	mg/L	≤0.05@95th percentile	0.20
Colour	Co-Pt	≤5@95th percentile	8

[1] Rolling Performance Measure (RPM)
For 95th percentile compliance a sample is deemed to comply if no more than two tests out of the most recent fifty tests exceed the stated maximum RPM values.
[2] For Particle Count compliance a sample is deemed to comply if there is less than 100 particles per millilitre in the size range 3µm to 12µm.

Additional Quality Parameters			
Parameter	**Units**	**RPM[1]**	**Limiting Value**
Iron (total)	mg/L	n/a	0.05
Manganese (total)	mg/L	≤0.01@95th percentile	0.02
Turbidity	NTU	≤0.30@95th percentile	0.50
Quality Parameters for Landershute Water Treatment Plant			
Aluminium	mg/L	≤0.05@95th percentile	0.20
Bromate	mg/L	n/a	0.02
Colour	Co-Pt	≤5@95th percentile	8
Iron (total)	mg/L	n/a	0.05
Manganese (total)	mg/L	≤0.01@95th percentile	0.02
Trihalomethanes	mg/L	n/a	0.20
Turbidity	NTU	≤0.30@95th percentile	0.50

Disinfection				
Site ID	**Free Chlorine Residual Target**	**Plan Number**	**AMG Easting**	**AMG Northing**
Noosaville Council Works Depot	0.5 mg/L	SC100B	504093	7078605
Image Flat Water Treatment Plant	3.0 to 3.5 mg/L	SC200A	492502	7057906
Kenilworth Water Treatment Plant	0.5 to 1.2 mg/L	SC300B	472981	7058377
Landershute Water Treatment Plant	1.2 to 1.5 mg/L	SC400B	491083	7044778
Maleny Water Treatment Plant	0.5 to 1.0 mg/L	SC500B	484623	7039983

Schedule 4 – PRW Water Quality Requirements

1. Best endeavours will be used to ensure that the Purified Recycled Water supplied at the PRW Supply Points shall comply with s18AD of the *Public Health Regulation 2005* (Qld) (PHR), and meet the additional parameters set out in the table in Item 3 of this Schedule.

2. Compliance with Item 1 above, is subject to:

   (a) an annual 98 percent pass rule for the microorganisms listed in Part 1, Schedule 3B of the PHR;

   (b) an annual 95th Percentile for those chemical compounds listed in Part 2, Schedule 3B of the PHR; and

   (c) an annual mean for those parameters listed in Item 3 of this Schedule (except for Turbidity and Total Dissolved Solids which are based on maximum values).

Parameter	Water Quality Standard
Hardness as $CaCO_3$	50 to 125 mg/L
Alkalinity	40 to 100 mg/l
Total Nitrogen	<1.5mg/L
Total Phosphorous	<0.15 mg/L
Turbidity Maximum	5 NTU
pH	6.5 – 8.5
Total Dissolved Solids (TDS) Maximum	250mg/L
Manganese	<0.05mg/L
Copper	<0.05mg/L
Boron	<0.37mg/L
Aluminium	<0.1mg/L
Zinc	<0.1mg/L

3. **Meanings for Item 3.2 of the Schedule.**

The following terms have the following meanings:

(a) "annual" this means a rolling 12 month basis, and

(b) percentiles are to be calculated in accordance with the methodology set out in the *Australian Drinking Water Guidelines 2004* developed by the National Health and Medical Research Council in collaboration with the Natural Resource Management Ministerial Council, and includes any amendments, revisions and subsequent versions of these guidelines.

Schedule 5 – Bulk Supply Points

Manufactured Water Supply Point means the point at which Purified Recycled Water discharges from the Western Corridor Recycled Water Scheme into Wivenhoe Dam.

Raw Water Supply Point means the point at which a third party takes Raw Water at the Commencement Date or such other point as the Parties agree under clause 13.

Potable Water Supply Point means the point at which Potable Water exits a clearwater storage at a water treatment plant.

2010 ID	Description	Easting	Northing	GC 2010 ID
BS-01	Molendinar Water Treatment Plant Outlet	534715	6905142	BS-BT-03
BS-02	Mudgeeraba Water Treatment Plant Outlet	532156	6891095	BS-BT-04
BS-03	Calamvale/Algester Aquifer	502591	6946275	QUU-425
BS-04	Forest Lake Aquifer	496297	6946010	QUU-426
BS-05	Sunnybank Aquifer	505547	6949128	QUU-427
BS-06	Runcorn Aquifer	507314	6948091	QUU-428
BS-07	Chandler Aquifer	514313	6956925	QUU-429
BS-12	North Pine Dam	494298	6984141	BS-BT-09
BS-13	North Stradbroke Island Water Treatment Plant outlet	543420	6949331	BS-BT-05
BS-14	Dunwich Water Treatment Plant Outlet	540725	6957444	RCC-55
BS-15	Amity Point Water Treatment Plant Outlet	544968	6967726	RCC-57
BS-16	Point Lookout WTP	550093	6965780	RCC-58
BS-17	Woodford Water Treatment Plant	476347	7020033	MBRC-05
BS-18	Bribie Island South Water Treatment Plant	519566	7005528	MBRC-07
BS-	Caboolture Water Treatment Plant	493944	7004047	MBRC-

2010 ID	Description	Easting	Northing	GC 2010 ID
19				04
BS-20	Helen St Beaudesert	499330	6904859	QUU-412
BS-21	Albert River Water Treatment Plant	502571	6903651	QUU-413
BS-22	Canungra WTP	515929	6900427	QUU-409
BS-23	Kooralbyn	485697	6892261	QUU-411
BS-24	Rathdowney Water Treatment Plant	486939	6878743	QUU-410
BS-25	Boonah-Kalbar Water Treatment Plant	462264	6906660	QUU-408
BS-26	Noosa (Lake MacDonald)	493155	7082186	SCRC-01
BS-27	Noosa (Lake MacDonald) -	493351	7082189	SCRC-02
BS-28	Image Flat Water Treatment Plant	492506	7057912	SCRC-04
BS-29	Kenilworth	472986	7058376	SCRC-05
BS-30	Maroochy - Pipe to Nambour	491113	7044800	SCRC-06
BS-31	Landershute to Caloundra	495834	7042306	SCRC-07
BS-32	Landershute - Caloundra new main	503283	7042881	SCRC-08
BS-33	Landershute - Maroochy new main	504646	7045123	SCRC-09
BS-34	Maleny	484634	7039999	SCRC-10
BS-36	Image Flat to Maroochy	492518	7057895	SCRC-03
BS-37	Lowood for Tarampa/Minden	458701	6960930	QUU-415
BS-38	Esk Water Treatment Plant	443915	6985846	QUU401
BS-	Somerset Water Treatment Plant	455855	7000962	QUU-

2010 ID	Description	Easting	Northing	GC 2010 ID
39				402
BS-41	Linville Water Treatment Plant	428936	7030212	QUU-403
BS-42	Kilcoy (Wade St) Water Treatment Plant	456792	7020926	QUU-404
BS-43	Somerset (Kilcoy)	457355	7018998	QUU-405
BS-44	Jimna (Yabba Ck) Water Treatment Plant	446780	7050573	QUU-406
BS-45	Lowood Water Treatment Plant	458720	6960941	QUU-407
BS-46	Capalaba Water Treatment Plant	518151	6954529	BS-BT-06
BS-47	Enoggera Water Treatment Plant	493110	6964103	QUU-423
BS-48	Enoggera Water Treatment Plant	493108	6964101	QUU-424
BS-49	Dayboro Water Treatment Plant			MBRC-20
BS-50	Mt Crosby East Bank	481267	6955539	BS-BT-08
BS-51	Mt Crosby West Bank	481253	6955537	BS-BT-07
BS-52	Banksia Beach Water Treatment Plant	519566	7005528	MBRC-09
BS-53	Petrie Water Treatment Plant			MBRC-21
BS-54	Enoggera WTP, 50 Mt Nebo Rd	492839	6964222	QUU-422
BS-55	Ewen Maddock WTP	501294	7039242	SCRC-11
BS-56	Wamuran Water Treatment Plant			MBRC-22
BS-56	Molendinar to Allconnex	537005	6892131	GCCC-13
BS-57	South Maclean WTP	502630	6924413	LCC-23

Schedule 6 – Raw Water Metering (Power Stations)

1. **In respect of Raw Water supplied to Bulk Supply Points for CS Energy Limited:**

For the purposes of this Contract, unless the Parties agree otherwise in writing, for so long as Raw Water from Wivenhoe Lake and the Warrill Supply Scheme are delivered into Berry's Lagoon and taken from Berry's Lagoon by CS Energy Limited, the total volume of Raw Water supplied to such Bulk Supply Points will be determined as follows:

Total volume of Raw Water supplied = Wivenhoe Volume + Warrill Volume

Where:

Wivenhoe Volume is the volume of Raw Water metered through the Kholo Meter; and

Warrill Volume is:

Volume of Raw Water metered through the Berry's Lagoon Meter - (Wivenhoe Volume x 0.90)

2. **In respect of Raw Water supplied to Bulk Supply Points for Tarong Energy Corporation Limited:**

For the purposes of this Contract, unless the Parties agree otherwise in writing, Water Grid Manager must calculate the volume of Raw Water supplied to such Bulk Supply Points as follows:

Volume of Raw Water supplied to Tarong Energy Corporation Limited = CM - PM

Where:

CM means the volume of water metered through the Caboonbah Meter for the relevant calendar month (**Caboonbah Meter** means the metering installation located on the Tarong Pipeline between the Caboonbah Balancing Tank and the Tarong Power Station in the vicinity of Grid Customer's Caboonbah Balancing Tank and known as M-085-BS Caboonbah Meter).

PM means the volume of water metered through the PRW Meter for the relevant calendar month (**PRW Meter** means the metering installation owned and operated by Western Corridor Recycled Water Pty Ltd located in Wester Corridor Recycled Water Pty Ltd's pipeline at Caboonbah and known as M-086-MW).

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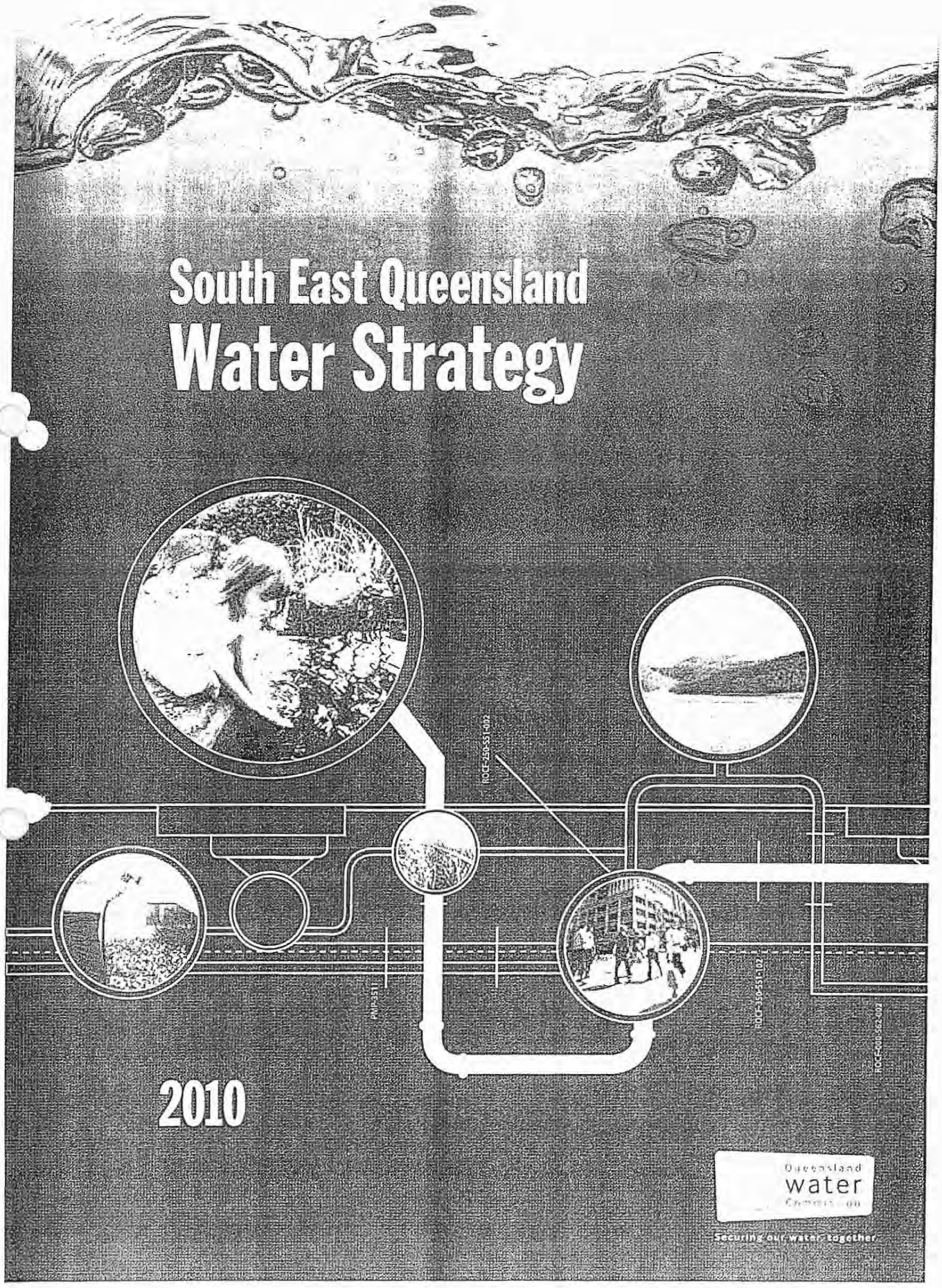
Water Strategy



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Securing our water together

South East Queensland
Water Strategy

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Securing our water, together.

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Executive summary

The *South East Queensland Water Strategy* (the Strategy) is the adaptable blueprint for maintaining water security in South East Queensland (SEQ) into the future.

The Strategy enhances the transparency of planning for, and operation of, the SEQ Water Grid. It delivers a Water Supply Guarantee, which ensures sufficient water is available to support a comfortable, sustainable and prosperous lifestyle while meeting the needs of urban, industrial and rural growth and the environment.

This Guarantee will be delivered through a demand management framework, appropriate infrastructure investment and efficiencies gained through operation of the region-wide SEQ Water Grid.

Context

The Millennium Drought is now behind us. Our water supply is now secure, due to SEQ dams currently at or near full capacity and due to the range of measures that were adopted as part of the drought response. These measures include improved water use efficiency, new supplies and streamlined institutional arrangements. All of SEQ is now under the same consistent out-of-drought water management framework, with average regional residential consumption remaining consistently below 200 litres per person per day.

Now is the time to plan for the region's future needs, ensuring that security of supply is maintained in the face of population growth and climate variability and change. The opportunity now exists to use water and operate existing infrastructure more efficiently, deferring the next bulk water supply source for as long as possible. A more staged and inclusive approach to planning for these new supplies can also be adopted.

The Strategy builds on the range of institutional changes that are currently underway to ensure the efficient and effective operation of the SEQ Water Grid, and on the enhanced security provided by the diverse range of supply sources that have now been constructed.

Within this context, the key features of the Strategy are encapsulated in the general themes of:

- use less
- be supply-ready
- manage efficiently.

Use less

Efficient water use: Planning has been based on the conservative assumption that the community will reduce per-person water consumption by over 24 per cent compared to trends prior to the Millennium Drought.

Target 200: The Strategy challenges residents to do even better than planning assumptions, maintaining average consumption at or below 200 litres per person per day. If this can be achieved, the need for new supplies will be deferred.

Local water supplies: Off-Grid supplies, such as rainwater tanks, must now be installed for all new houses and most new industrial and commercial buildings. This water will be used for appropriate internal purposes, as well as for outdoor watering. The Strategy supports the adoption of stormwater harvesting and recycling where efficient and effective.

Be supply-ready

Drought planning: The Strategy plans to minimise the impact of future droughts through planned investment, prudent management and a pre-determined drought response plan. It sets an objective that the community experience water restrictions no more than once every 25 years, on average.

New water supplies: The Strategy will be reviewed before another major supply source is required. In the meantime, a range of potential supplies will be investigated in detail. Based on current information and technology, desalination facilities will underpin future water security for SEQ.

Manage efficiently

Purified recycled water: The Western Corridor Recycled Water Scheme provides security of supply as a standby facility. This means that existing sources can be more effectively utilised because in times when dam levels are low, purified recycled water will be available to supplement our dams—ensuring that security of region's water supply can be maintained.

Rural production: A range of measures to enhance the availability of water for rural production will be investigated, including making water that is not required for urban use available on an interruptible basis. Up to 32 000 megalitres per year of recycled water has been made available for supply to the Lockyer Valley and other areas, subject to commercial arrangements that are fair and do not disadvantage other SEQ water users.

Our vision

The Strategy's vision is expressed as desired Level of Service (LOS) objectives, which relate to the expected frequency, duration and severity of restrictions during future droughts. A conservative approach has been taken when determining the required LOS system yield for SEQ, which considers population growth, climate change and variability and the extent of the potential rebound in consumption demand following the drought.

The LOS objectives mean that future investments in the water supply system will be made so that sufficient water from the SEQ Water Grid will be available to meet average regional urban demand of up to 375 litres per person per day, including an allowance of up to 230 litres per person per day for residential uses. Infrastructure will be planned so that the frequency of restrictions will be no more than once every 25 years, on average. These restrictions would be much less severe than those that applied during the recent drought, which prohibited almost all outdoor water use.

Use less

The Strategy outlines measures for residents, business and industry to maintain efficient and responsible water consumption by residents, business and industry.

The Strategy challenges SEQ residents to do even better than the planning assumption of an average residential consumption of 230 litres per person per day, maintaining average residential consumption at or below 200 litres per person per day (Target 200). If this target is achieved, future water supplies can be deferred and the amount of water that is treated and distributed through the SEQ Water Grid can be reduced—saving money and electricity and reducing the carbon footprint.

The Strategy's aim is to achieve this target without significantly changing the lifestyle that SEQ residents enjoy, including the ability to sustain healthy, water-wise gardens. The challenge is maintaining, in the long term, the behavioural change brought about by the drought, as actual residential consumption will vary between households and across SEQ, and between seasons and years.

Building on Permanent Water Conservation Measures, which were introduced across SEQ on 1 December 2009, where time restrictions have generally been relaxed but efficiency measures remain in place, a range of other existing measures will continue and a number of new measures will be investigated in order to encourage efficient water use. These measures include:

- ensuring that all new buildings are water-efficient
- ensuring that existing buildings become more water-efficient, such as by requiring water-efficient showerheads to be installed as part of major renovations
- moving business and industry towards best practice water efficiency, through the preparation and implementation of water efficiency management plans
- minimising system losses
- undertaking targeted information and education programs, such as for schools and selected industries.

The QWC will review the key components of the demand management program on an ongoing basis and will seek to ensure that the program encourages water efficiency at the lowest overall economic, social and environmental cost.

Local supplies

Since 1 January 2007, all applications lodged for the construction of new homes in SEQ have had to demonstrate how they achieve the mandatory water savings targets. Detached houses must target savings of 70 000 litres per year, while terrace houses and townhouses must aim to achieve savings of 42 000 litres per year.

The water savings targets are forecast to apply to about 500 000 new houses by 2026 and about 800 000 houses by 2056, depending on population growth and household type.

These off-Grid supply sources are forecast to reduce demand on the SEQ Water Grid by about 35 000 megalitres per year in 2026 and about 60 000 megalitres per year in 2056— almost one and a half times the capacity of the existing desalination facility at Tugun. Savings from existing rainwater tanks and new tanks on commercial and industrial buildings are in addition to this.

Internally plumbed rainwater tanks are one option to achieve the water savings target. Alternatives include communal rainwater tanks, stormwater harvesting and dual-reticulation recycled water systems. Each of these options can have beneficial outcomes for other elements of the water cycle—such as capturing stormwater run-off and reducing the discharge of nutrients into waterways—but must be balanced against cost considerations.

The most appropriate solution will vary depending on local circumstances. To ensure that these decisions are well informed, a range of research is underway and some demonstration stormwater harvesting schemes are proposed.

Be supply-ready

Saving water will postpone, but not preclude, the need for additional supplies in the future, to meet growth and ensure security in times of drought.

Scenario analysis indicates that the construction of the next supply source will probably be triggered by demand growth. While this could be required in 2021, it is more likely to occur around mid-2020s (refer to Figure A). The 2021 timeframe could be delayed if there is:

- high series population growth and a regional average residential consumption of 200 litres per person per day
  or
- medium series population growth and a regional average residential consumption of 230 litres per person per day.

Residential consumption can have a major impact on the timing of the next major supply. By achieving the voluntary target of maintaining average residential consumption at or below 200 litres per person per day, additional supplies could be deferred by at least five years. For example, the earliest time at which a new supply will be required could be deferred from 2021 to around 2027.

Several scenarios have been prepared to assess the possible implications of the uncertainties of the key variables of population growth, demand and climate change. Table A illustrates possible augmentation timeframes. The Strategy has been developed to ensure that the region's water supplies will be secure in all of these scenarios.

Climate change and our dams

Climate change may have a significant impact on the supply from our dams. The majority of climate modelling done to date indicates that SEQ is likely to become hotter and drier, with reduced inflows to dams and increased demand for water.

The CSIRO is undertaking local-scale modelling for SEQ. The preliminary results indicate that, while climate change may reduce yield by about 10 per cent, the impact is likely to occur over decades, rather than immediately.

The impact of climate change is being researched through the Queensland Climate Change Centre of Excellence and the Urban Water Security Research Alliance. The Strategy will be revised as our understanding of the likely impacts of climate change on SEQ water supplies improves.

Table A Impact of reduced consumption on the timing of the next augmentation

Scenario	Regional average residential consumption	
	230 litres/person/day	200 litres/person/day
Earliest date with: • high population growth • provision for climate impact	2017	2022
Likely date with: • high population growth	2021	2027
Likely date with: • medium population growth • provision for climate impact	2020	2027
Latest date with: • medium population growth	2026	2032

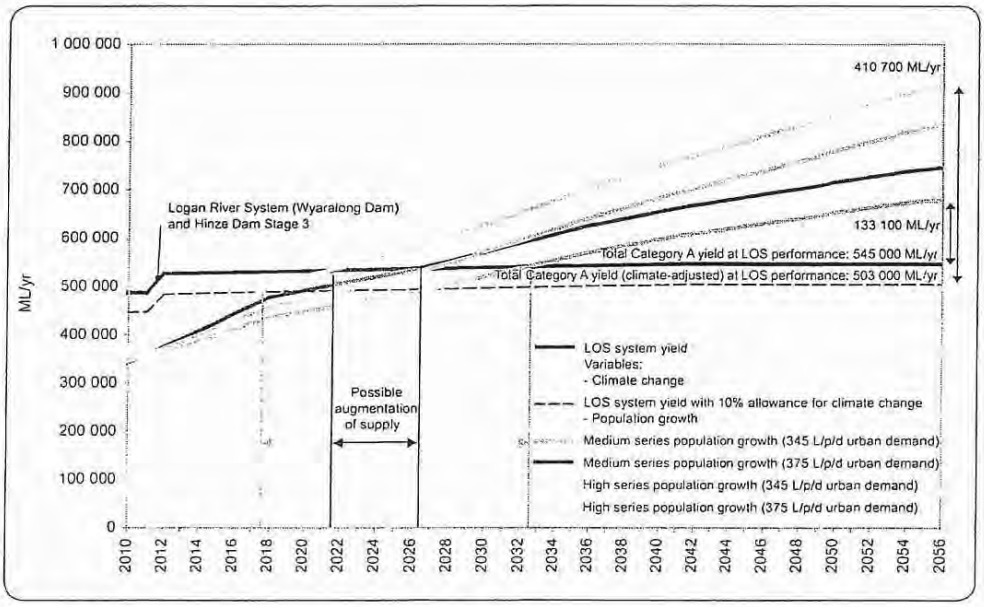


Figure A Water balance in normal operating mode

The purpose of the Strategy is to augment supplies at appropriate times to prevent a gap from developing. The QWC will update the Strategy regularly and as key assumptions change. The timing of future infrastructure will become clearer as projected population growth estimates are revised, average residential consumption patterns are confirmed and there is more certainty about the long-term impacts of climate change on water supply sources. Changes to these forecasts will have a direct impact on the planning program for potential water supplies.

The construction of major new supplies may also be triggered as part of a drought response. A drought response plan is an integral part of the Strategy as it establishes an upfront plan to ensure continuity of supply regardless of climatic conditions. The QWC will complete the drought response plan in 2011.

Our potential future sources of supply

Prudent planning for future supplies is needed, to ensure that the best options can be selected when required. With new supplies unlikely to be required until after 2021, the QWC will take advantage of that time to investigate the options thoroughly, including appropriate research and stakeholder engagement.

It is expected that desalination facilities will underpin our future water security, based on existing information and technology. The Queensland Government has announced priority and reserve desalination sites, as listed in Table B.

Table B Priority and reserve desalination sites

Category	Site	Property description	Owner
Priority	Lytton	Lot 49 SP193294	State of Queensland
	Marcoola	Lot 753 CG3375	Sunshine Coast Regional Council
Reserve	Tugun (duplication of existing facility)	Lot 30 SP197355	Gold Coast City Council/State of Queensland
	Bribie Island	Lot 67 SP214143	State of Queensland

There are also a number of small potential dams and weirs that will be investigated, as well as options to upgrade existing supplies. Options will be investigated in the Mary River catchment, including raising Borumba Dam and water harvesting. Making use of the remaining strategic reserve of unallocated water in SEQ warrants further investigation, given the limited number of alternatives.

Purified recycled water is currently available to augment Wivenhoe Dam as part of a drought response, increasing the amount that can be taken from dams and weirs in normal conditions. Over time, community confidence in purified recycled water schemes may permit the development of additional schemes and the further utilisation of the Western Corridor Recycled Water Scheme. The QWC considers it prudent to proceed with investigations of these potential schemes, with a view to preserving land for treatment facilities and pipeline corridors if viable. The QWC will continue to provide information to the community regarding purified recycled water.

The water supply options that will be investigated in detail are listed in Table C.

Table C Potential supplies to be investigated in detail

Type of source	Potential source
Desalination sites	• Marcoola (priority site) • Lytton, near the Brisbane River mouth (priority site) • Duplication of the facility at Tugun on the Gold Coast (reserve site) • Bribie Island (reserve site)
Dams and weirs	• Borumba Dam Stage 3, water harvesting from the Mary River or a combination of both • Raised operating levels in Wivenhoe Dam • Raising of the Mt Crosby Weir • Additional minor supplies in the Logan and Albert catchment, potentially including a pipeline between the Bromelton Off-stream Storage and Wyaralong Dam • Stormwater augmentation of dams
Purified recycled water schemes	• Augmentation of Hinze Dam • Augmentation of North Pine Dam

Scenario analysis indicates that if climate change impacts occur relatively soon additional water supplies might need to be available from 2017, with construction commencing by 2014. While unlikely, it is prudent to be ready to respond if necessary. The QWC will now commence detailed planning and obtain preliminary approvals to ensure that new supplies can be delivered efficiently when required. The QWC will engage with local councils and neighbouring communities in all stages of the planning process.

The detailed planning will inform a final decision regarding the next major supply when regionally significant supplies are needed. The Strategy sets out the process by which the QWC will assess alternatives and the basis for its advice to Queensland Government, including a Statement of Needs process similar to that used in the electricity sector.

Manage efficiently

Water supply for SEQ is secure for the short to medium-term, due to the construction of the SEQ Water Grid and key storages being full or near full. Given this situation, and assuming continued water efficiency, there is about 1 per cent probability of key storages falling to 40 per cent of capacity over the next 10 years, triggering the re-introduction of Medium Level Restrictions.

This Strategy seeks to ensure that the benefits of the short to medium-term security are maximised, deferring the time when major new supplies will be required. It establishes a framework for the efficient operation of the SEQ Water Grid, which complements the measures in place for efficient water use in homes and businesses.

The SEQ Water Grid allows water supplies to be managed efficiently in a way not previously possible, providing the ability to shift our water to where it is needed most.

Linking our water sources across the region has produced a 14 per cent increase in the LOS system yield of sources of supply existing in 2006. The increase is being achieved through the coordinated management of dams, and by managing risk at a regional level.

The SEQ Water Grid also benefits from the availability of the desalination facility at Tugun and the Western Corridor Recycled Water Scheme. These supplies provide a secure supply in severe drought, enabling more water to be taken from dams when levels are high. Importantly, they deliver this benefit without being operated at capacity at all times.

In the case of the Western Corridor Recycled Water Scheme, this means that the policy of using the Scheme to augment Wivenhoe Dam only when key Water Grid storage levels fall to 40 per cent of capacity reflects an optimal operating strategy at this time.

The Western Corridor Recycled Water Scheme is expected to directly supply up to about 36 000 megalitres per year for urban purposes, depending upon the level of demand from the power stations. However, its overall contribution towards the yield of the SEQ Water Grid is much greater. In conjunction with desalinated water, the Scheme increases the capacity of the Water Grid by up to 100 000 megalitres per year.

At the same time, increasing the trigger would have minimal impact on overall system yield, deferring the next source of supply by up to one and a half years,. Increasing the trigger point at which purified recycled water is added to Wivenhoe Dam—currently 40 per cent—would increase operating costs and the likelihood of the dam spilling. The costs and benefits of changing the trigger will be assessed as demand approaches supply.

Water for rural towns

About 20 000 SEQ residents live in communities that have drinking water supplies not directly connected to the SEQ Water Grid. These communities differ in terms of size and forecast population growth, and they are serviced by a diverse range of water supply sources with varying levels of security.

A number of communities are indirectly supplied from SEQ Water Grid assets and are benefiting from improved security of supply following the completion of new supplies. These communities include:

- Beaudesert, Kooralbyn and Rathdowney, which are supplied from the Logan River system
- Aratula, Boonah, Kalbar and Mount Alford, which are supplied from the Warrill Valley system.

Over time, the Strategy seeks to achieve the same LOS objectives for all communities with reticulated water supplies as for those connected to the SEQ Water Grid. Options to improve security to a number of towns are currently being investigated, with the highest priorities being Beaudesert and Canungra given the size and recent history of water supply issues in these communities.

Water for rural production

Rural producers in SEQ used about 150 000 megalitres per year of water in 2005.

The Queensland Government has announced that up to 32 000 megalitres per year of additional water supplies will be made available for rural production from the Western Corridor Recycled Water Scheme, outside times of severe drought.

The QWC will lead the investigation of a range of other options to potentially improve the availability of water for rural production. These options may increase the total amount of water available, or improve the reliability of its supply.

The SEQ Water Grid provides opportunities for aligning the management of urban and rural water supplies in some catchments. A range of options are to be investigated, including ways to provide higher levels of reliability for existing allocations and provide certainty about allocations earlier in the water year. Any such supply must occur within a transparent framework, which ensures that the costs are appropriately shared.

For example, 8250 megalitres per year of high priority water previously used by the Swanbank power station and Ipswich City Council has been reserved under the SEQ System Operating Plan to increase supply reliability for urban growth in Boonah and surrounding towns. Through this reserved water, the reliability of supply to irrigators in the Warrill Valley has also been improved.

The Strategy builds on existing Queensland Government initiatives in the Rural Futures Strategy, to ensure appropriate pricing, fair water trading and improved water use efficiency.

Energy for water

By using water more efficiently, the amount of water that is treated and distributed through the SEQ Water Grid will be reduced and region's carbon footprint lowered.. The Strategy estimates that, by maintaining average total consumption at 24 per cent below pre-drought trends, a 38 per cent saving in energy consumption can be achieved for bulk water requirements in 2048. These savings are equivalent to the total energy consumption of around 86 000 homes in 2020. Additional savings will be achieved if residents of SEQ achieve the voluntary Target 200.

Despite these savings, SEQ's water supply system will become increasingly energy-intensive over time, especially with an increased reliance on climate independent desalination. When dam levels are high, the SEQ Water Grid encourages lower energy use as it:

- allows less energy-intensive sources to be used first
- reduces water transfers.

With existing infrastructure, the energy intensity of bulk water delivered to a home in SEQ is still less than 3 per cent of typical household energy consumption.

Institutional arrangements

Reforms needed for water management in SEQ were implemented in order to fully realise the benefits of the SEQ Water Grid and ensure the efficient and effective operation of the diverse range of supply sources.

The first phase of reform implementation was completed on 1 July 2008, with the establishment of the four new entities that own and operate the SEQ Water Grid.

With the establishment of the three new distributor-retailers owned by local councils on 1 July 2010, the next stage of institutional reform was completed. These entities own and operate the water reticulation and wastewater infrastructure in the region.

Beyond the physical operation of the SEQ Water Grid, the reformed institutional arrangements also have the potential to deliver significant benefits to the community through:

- simplified business structures to deliver water services in a coordinated manner
- creation of economies of scale and scope due to the reduced number of entities
- efficiency in service provision by specialist entities, with the amalgamation of technical skill sets
- higher technical skill levels across the industry through coordinated training and education
- clarification of the respective roles of state and local governments
- improved transparency and accountability for bulk transport and distribution networks with a strong asset management regime
- enhanced economic regulation.

Implementation and review

The Strategy outlines the key elements of the first Statement of Needs, which are the projects that must proceed over the next 10 years in order to ensure that the LOS objectives can be achieved. The key elements are as follows:

- Committed projects should be completed.
- Beyond these projects, additional bulk water supplies could be required in 2021.
- Operational improvements and capital upgrades should continue, in order to comply with water quality requirements under the *Water Supply (Safety and Reliability) Act 2008*.
- A drought response plan will be prepared.

The QWC will review and update the Strategy at least every five years, aligned with the review of the *South East Queensland Regional Plan 2009-2031*, or as major developments or changes in key assumptions occur. The QWC will report annually on the implementation of the Strategy, considering the currency of key assumptions.

Chapter 1

Setting the scene

This chapter explains the purpose of the *South East Queensland Water Strategy* (the Strategy), the guiding principles and the Water Supply Guarantee, which is the Queensland Water Commission's (QWC) vision for the future and the basis for water supply planning.

Key messages

- The Strategy will deliver the Water Supply Guarantee, a vision of sufficient water to support a comfortable, sustainable and prosperous lifestyle while meeting the needs of urban, industrial and rural growth and the environment.
- This vision includes a well-informed, water-wise community that is engaged in the planning process as decisions are made. Key elements of this vision are:
  - balancing community expectations of water security, quality and cost
  - embedding water efficiency throughout the water supply and demand chain
  - managing water security through diversified and integrated water supplies, and drought preparedness
  - improving environmental outcomes, including healthier waterways, through integrated strategic planning and catchment management.
- The Strategy provides a comprehensive planning and implementation framework to secure water supplies for South East Queensland (SEQ) for the long-term.

1.1 Purpose of the Strategy

As described in the *South East Queensland Regional Plan 2009–2031* (the Regional Plan), the purpose of the Strategy is to ensure that water in SEQ is managed on a sustainable and integrated basis to provide secure and reliable supplies of acceptable quality for all uses for the long term.

For the purposes of water planning, the local government areas that make up SEQ are:

- Brisbane City Council
- Gold Coast City Council
- Ipswich City Council
- Lockyer Valley Regional Council
- Logan City Council
- Moreton Bay Regional Council
- Redland City Council
- Scenic Rim Regional Council
- Somerset Regional Council
- Sunshine Coast Regional Council.

Planning for SEQ must be integrated with planning for adjoining areas. Water is already supplied to and from SEQ from adjoining areas. The Strategy takes these supplies into account. It also identifies other potential opportunities.

The largest existing supply from SEQ is to Toowoomba. Toowoomba Regional Council is responsible for water planning and management in Toowoomba. The Strategy takes into account the amount of water that might be supplied from the SEQ Water Grid through the recently completed pipeline.

Figure 1.1 shows the extent of the area covered by the Strategy.

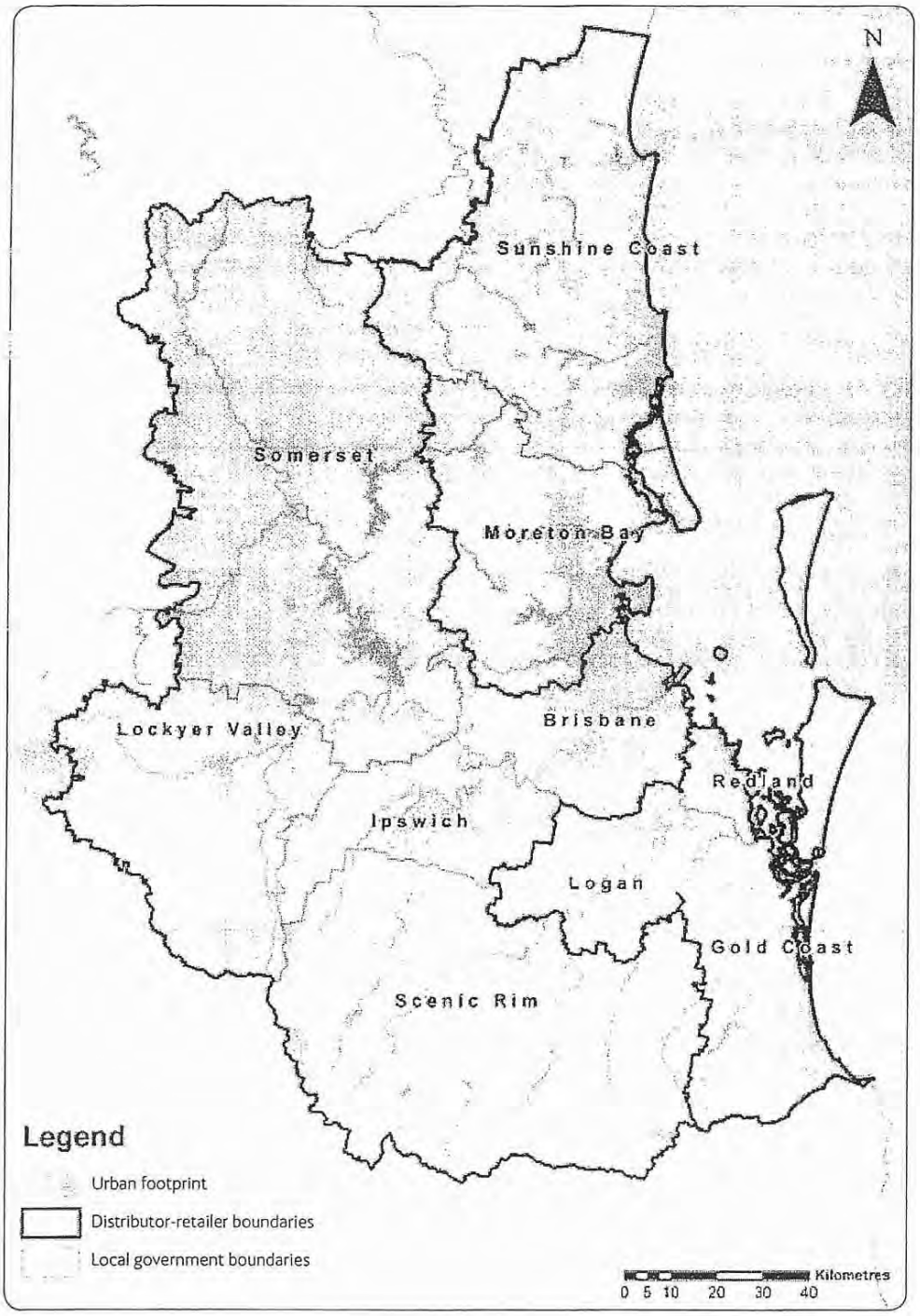


Figure 1.1 Area covered by the *South East Queensland Water Strategy*

1.2 Guiding principles

The QWC is responsible for advising the Queensland Government on achieving water security in SEQ. The *Water Act 2000* sets out the role of the QWC. The principles underpinning the Strategy derive from section 346 of the *Water Act 2000*.

Guiding principles

- Water is a scarce resource that is to be shared across the region.
- Water quality should be managed from its source to its end-users in a way that:
  - ensures the health of catchments, aquifers and their ecosystems
  - delivers water of a quality desired by the end-users at the lowest overall cost.
- Water supply arrangements should maximise efficient and cost-effective service delivery and the efficient use of water, such as appropriate connectivity between supply sources, in accordance with the Level of Service (LOS) objectives.
- The cost of water sources should be shared among users who benefit from them. Pricing should recognise Queensland Government commitments under inter-governmental agreements.
- Regional water supply assessments should consider environmental, social and economic factors, and include 'least cost planning' to ensure proper economic comparison of all supply and demand options.
- QWC water restrictions should help to achieve the region's objectives for long-term demand management for water and enable the appropriate management of any significant threat to the sustainability and security of the region's water supply.
- Flood mitigation and dam safety should be considered in assessments of regional water supply.

1.3 The Water Supply Guarantee

Economic development and a highly liveable environment have resulted in significant migration to SEQ in recent years, with the population doubling since 1981. This growth has increased demand for water.

In addition to this increased demand, SEQ recently experienced a severe drought and the worst recorded inflows to major storages in its history. In response to the drought, the community has demonstrated an outstanding commitment to reducing water consumption by embracing water restrictions and other voluntary water-saving behaviours.

The Strategy aims to reflect the community's attitude towards water through the vision of the Water Supply Guarantee for SEQ.

To deliver this regional vision, the Strategy was developed using the LOS approach to regional water planning. It includes ongoing consideration of climate change, climate variability, population growth and other regional factors affecting supply and demand.

The vision for water security in SEQ is explained in more detail below.

The Water Supply Guarantee

It is our vision that there will be sufficient water to support a comfortable, sustainable and prosperous lifestyle while meeting the needs of urban, industrial and rural growth and the environment.

Known as the Water Supply Guarantee, this water security vision will be achieved by:

- balancing community expectations of water security, quality and cost
- embedding water efficiency throughout the water supply and demand chain
- managing water security through diversified and integrated water supplies and drought preparedness
- improving environmental outcomes, including healthier waterways, through integrated strategic planning and catchment management.

1.3.1 Balancing community expectations

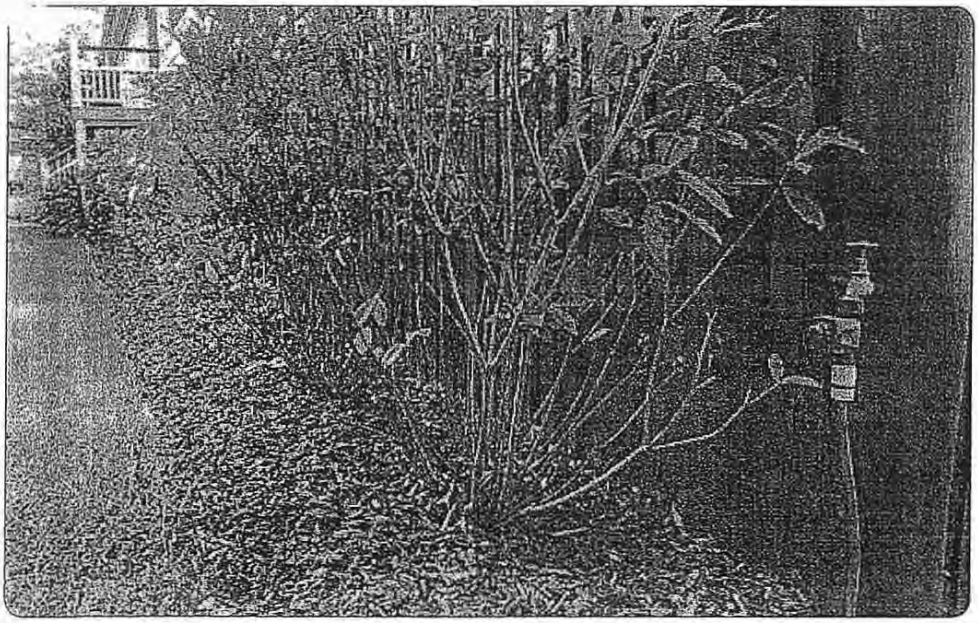
Water resources in SEQ will be managed sustainably, on a total water cycle basis.

Planning will be regularly reviewed, taking into account technological advances and changing demand patterns and attitudes.

Investments in the water supply system will be made with the objective that Medium Level Restrictions will not occur more than once every 25 years on average. The effect of these Medium Level Restrictions will be less onerous than the Extreme and High Level Restrictions applied during the recent drought.

Public health and safety will not be compromised.

These outcomes will be achieved at least cost to the community.



1.3.2 Embedding water efficiency

The Queensland Government will promote ways for residents of SEQ to value water and to use water efficiently without compromising quality of life.

There will be enough water to maintain our gardens, wash cars, top up swimming pools and fill paddle pools. As a water-wise community, we will water our gardens in the cool of the day, use efficient watering devices, such as drip irrigation, and minimise pool losses by using pool covers. Our houses will be fitted with water-efficient appliances, such as dual-flush toilets, so we can save water without thinking about it. Water conservation will be an important design aspect when building and renovating houses, and commercial and industrial buildings.

Our major commercial, industrial and government water users will have water efficiency embedded in their business. Once water efficiency is embedded, additional savings during drought will mostly come from residents reducing their outdoor use.

Our rural water users will be able to trade water and they will have efficient irrigation equipment and on-farm water use practices.

The SEQ Water Grid will be operated as efficiently as possible while achieving the LOS objectives, minimising operating costs and energy consumption.

1.3.3 Water security through diversified and integrated water supplies

SEQ will have a water supply system that is increasingly diversified and interconnected, including dams and weirs, desalination and water recycling.

This combination will allow us to make the most of the rain we receive and, in combination with a pre-determined drought response plan, meet our water needs during future periods of prolonged drought.

Local supplies, such as rainwater tanks and stormwater harvesting, will be an integral part of all new developments, reducing the demand for water from the SEQ Water Grid and contributing to improved environmental outcomes.

Corridors and potential infrastructure sites will be identified and preserved, at appropriate triggers, so we are ready to build the water supply infrastructure required in the future.

1.3.4 Improving environmental outcomes

Water supply sources will be managed in a way that enhances the health of our waterway systems. Nutrient discharges into Moreton Bay will be reduced because more of SEQ's water will be recycled. Enough water will be released into rivers and streams from our dams to maintain flora, fauna and river health.

1.4 Working in partnership

The Strategy was developed in partnership with key stakeholders, initially with the Queensland Government, the Council of Mayors (SEQ) and the bulk water authorities. Input was sought from industrial and rural water user groups, specialist working groups, the SEQ Healthy Waterways Partnership and the community.

1.5 Results of consultation

Two versions of the Strategy have been released for public consultation.

The first version was released for public consultation from 26 March 2008 to 31 July 2008.

During the consultation period, the QWC ran a campaign to raise awareness of the draft Strategy and its key content. The QWC sent a direct-mail brochure to 1.1 million SEQ households outlining the key features of the draft Strategy and information was conveyed in press advertising in a range of newspapers in SEQ. More than 2600 copies were distributed to other members of the community and almost 1500 people attended Strategy presentations. Community members were also engaged through events such as World Environment Day and the Royal Queensland Show (the 'Ekka').

The QWC received 175 responses on this version, of which 117 came from residents. Feedback was also received from 10 local government agencies, state and federal members of parliament, 20 business groups and organisations, 13 community and environmental groups and four rural water user groups.

Feedback on demand issues generally related to the proposed planning target of an average regional residential usage of 230 litres per person per day, total water cycle management, and business water efficiency measures. Feedback on water supply issues generally related to the proposed Traveston Crossing and Wyaralong dams, purified recycled water and other types of recycling, desalination and alternative additional water sources.

Feedback was also received on a range of other issues, including LOS objectives, population management, water pricing, the SEQ Water Grid, rural water and environmental issues.

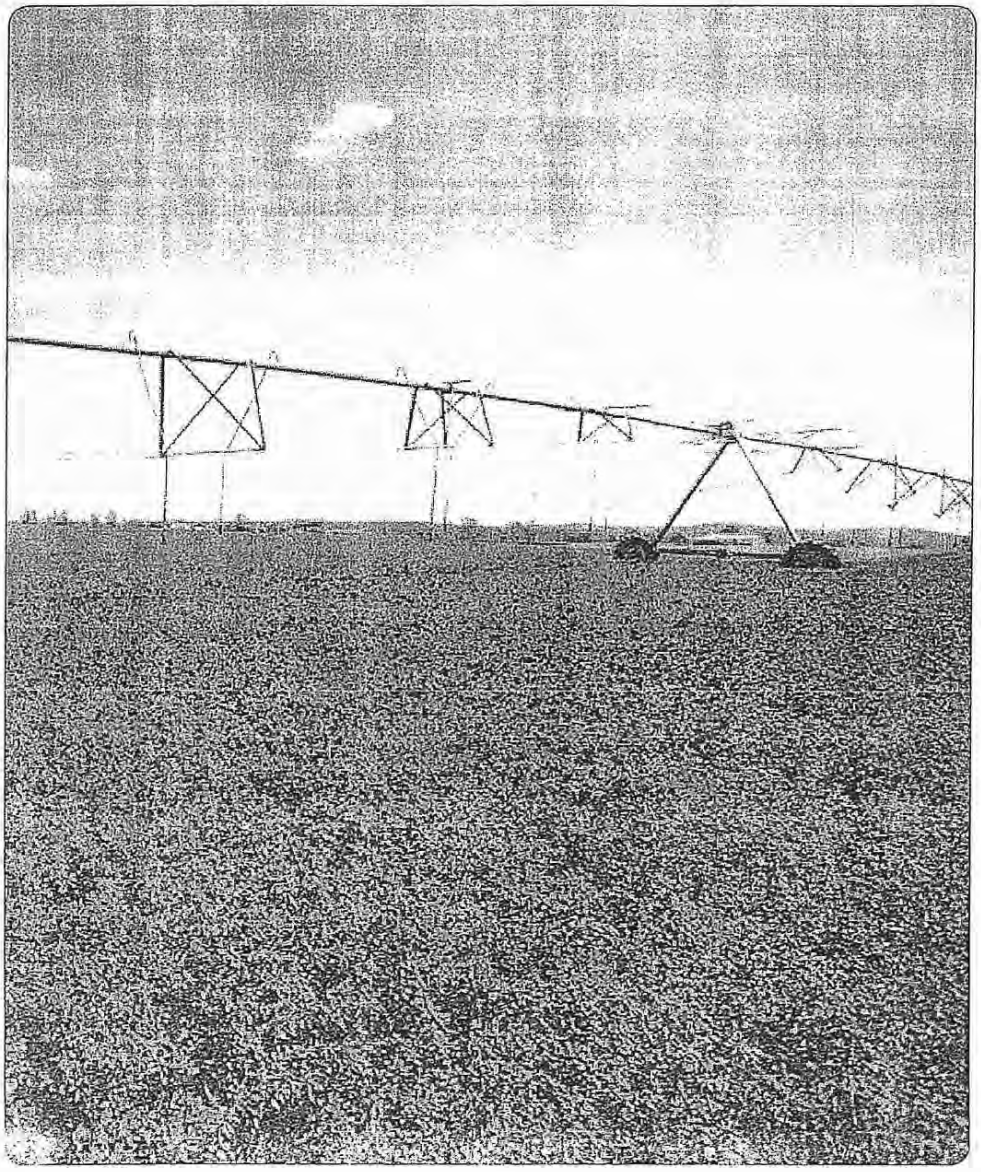
The revised draft Strategy was released for public consultation from 20 November 2009 to 12 February 2010. The revised draft Strategy incorporated feedback on the initial draft and policy decisions by the Commonwealth and state governments, notably the cancellation of Traveston Crossing Dam. In releasing the revised draft Strategy, the Minister and Commissioner specifically sought feedback on whether the regional average residential consumption target should be 200 or 230 litres per person per day.

The QWC received 3410 submissions on the revised draft Strategy, of which 3192 primarily related to identifying potential desalination sites on the Sunshine Coast.

The final Strategy responds to many of the issues raised during consultation. Key changes include:

- a voluntary regional residential consumption target of 200 litres per person per day (Target 200)
- more detail explaining the process by which the QWC will prepare advice on the next bulk water supply (Section 3.5)
- information about the framework for implementing total water cycle management in SEQ (Section 2.3)
- more detail in Section 4.6 to explain the role of local supply sources generally, and rainwater and stormwater specifically—including case studies for projects that are currently underway
- more explanation of how the LOS objectives will be achieved in communities with stand-alone water supplies (Section 6.5.1)
- more detail about the investigations into opportunities to increase the amount or reliability of water for rural production (Section 6.5)
- extensive revision of the section on the Strategy's energy implications, plus a new section on greenhouse gas impacts—including forecast greenhouse gas emissions for the operation of the SEQ Water Grid at full capacity and when supply equals demand (Section 6.8.4).

A consultation report has been released with the Strategy.



Chapter 2

Our planning context and challenges

This chapter describes the framework of plans, policies, strategies and programs that help to develop and manage growth and resources in SEQ. The chapter also describes the major challenges that affect how we plan for water for the future.

Key messages

- The Strategy will be reviewed on a five-yearly basis, aligned with the review of the Regional Plan, or in response to emerging issues that might be identified through the annual reporting process.
- The Strategy has been developed with consideration of the relevant laws, regulations, guidelines and agreements related to planning in SEQ.
- Key challenges facing SEQ include population growth and climate variability and change.
- Water supply planning must reflect a total water cycle management approach, contributing to improved outcomes for waterways and catchments.
- Water supplies for rural communities and rural irrigation should be enhanced.
- Potential sites for future water supply projects need to be identified, investigated and preserved.

2.1 Our legislative and policy frameworks

This section describes the legislative and policy framework for the Strategy.

Figure 2.1 shows some of the key state and regional plans that have influenced the development of the Strategy. Other policies and initiatives such as the National Water Initiative and the National Water Quality Management Strategy have also influenced its development.

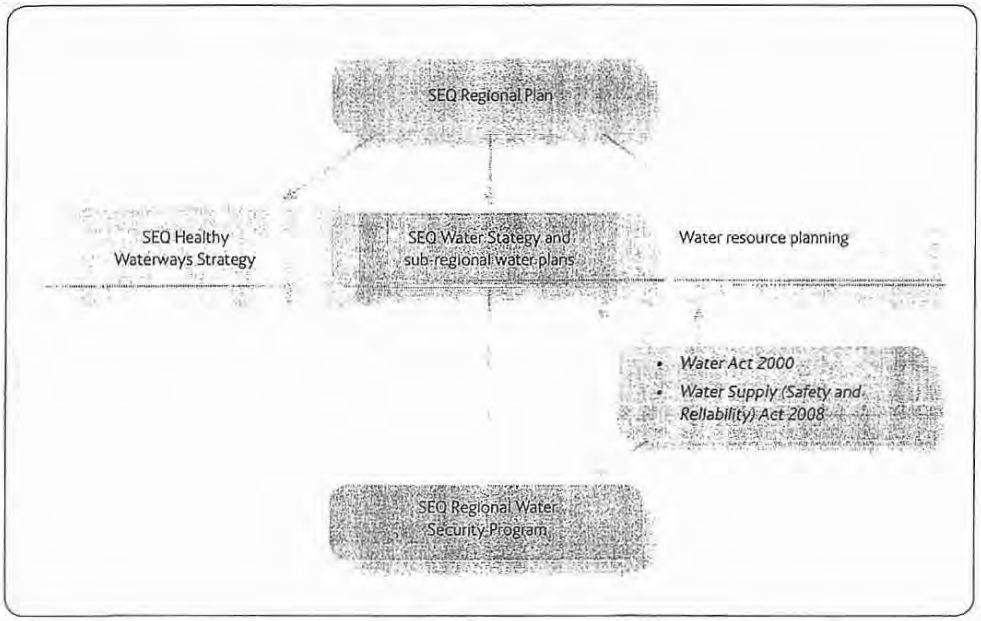


Figure 2.1 Relationship between the Strategy and other key planning processes

2.1.1 The SEQ Regional Water Security Program

The legislative and policy framework for water management in SEQ specifies a number of required (and enforceable) programs and plans. The Regional Water Security Program is one of these. The Regional Water Security Program is made by the Minister for Natural Resources, Mines and Energy and the Minister for Trade. It specifies, at a high level, how regional water security is to be achieved.

The Regional Water Security Program was adopted on 13 November 2006, providing for the construction of significant infrastructure. This program was revised on 5 March 2010 following the completion of most of these projects and the significant increase in storage levels across the SEQ region.

The Strategy and its associated analysis will provide the basis for future advice that the QWC provides to the Minister for Natural Resources, Mines and Energy and Minister for Trade on regional water security options.

2.1.2 The South East Queensland Regional Plan

The *South East Queensland Regional Plan 2009–2031* (Regional Plan) provides a framework for sustainable growth to the year 2031. It describes management strategies, regional land use patterns and policies to address growth management issues.

The Regional Plan states that water is a valuable and finite regional resource that requires management on a total water cycle basis.

The Regional Plan requires that there are secure supplies of water to meet reasonable growth and development in the region, including meeting rural water needs. This must be done while minimising overall system costs and protecting and enhancing the ecological health of our groundwater and surface water systems. It supports targeted reductions in water consumption by efficient use of water and management of consumer behaviour. Under the Regional Plan, the Strategy is to examine alternative water sources and demand management options, and develop a strategic direction for water supply in the region through to 2056.

2.1.3 Water resource planning

Water resource planning provides a framework for the sustainable allocation of water resources. Together, water resource plans and resource operations plans specify:

- the proportion of water flows that are provided for the environment
- the volumes of water that have already been allocated as entitlements which may be used for urban, industrial or rural purposes
- what water, if any, might be available for future allocation and use.

Water resource plans provide a framework for the allocation and management of water in a specified area. They do this by:

- defining the availability of water in an area
- providing a framework for sustainably managing and taking water in an area
- identifying priorities and mechanisms for dealing with future water requirements
- providing a framework for reversing, where practicable, degradation that has occurred in natural ecosystems.

Water availability is mainly reflected as entitlements, which are specified following rigorous environmental, hydrologic, social and economic assessment processes.

Resource operations plans implement water resource plans by management rules and arrangements necessary to satisfy the water resource plans' objectives and outcomes. They establish rules for monitoring, water sharing and water trading, and processes for dealing with unallocated water, within a single catchment. In addition, they establish tradeable water allocations.

In SEQ, the water resource plans for the Mary, Moreton, Logan and Gold Coast catchments have been finalised (refer to Figure 2.2). Resource operations plans for the Logan, Gold Coast and Moreton have been completed, while the resource operations plan for the Mary catchment is currently in development. Figure 2.3 illustrates the relationship between water resource plans, resource operations plans and the System Operating Plan, which is described in Chapter 3. Separate plans address other aspects of water planning, such as demand management.

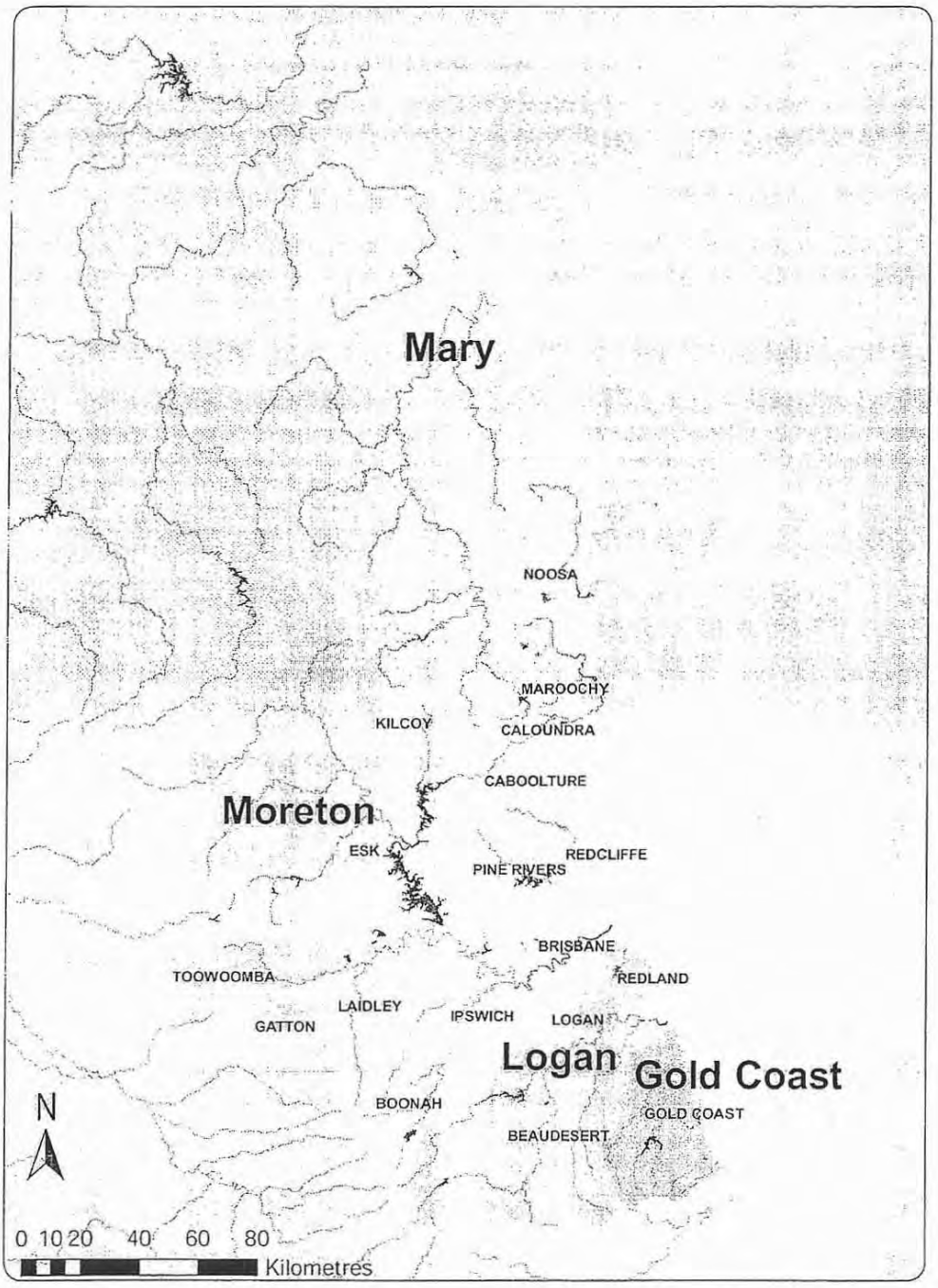


Figure 2.2 Water resource plan areas

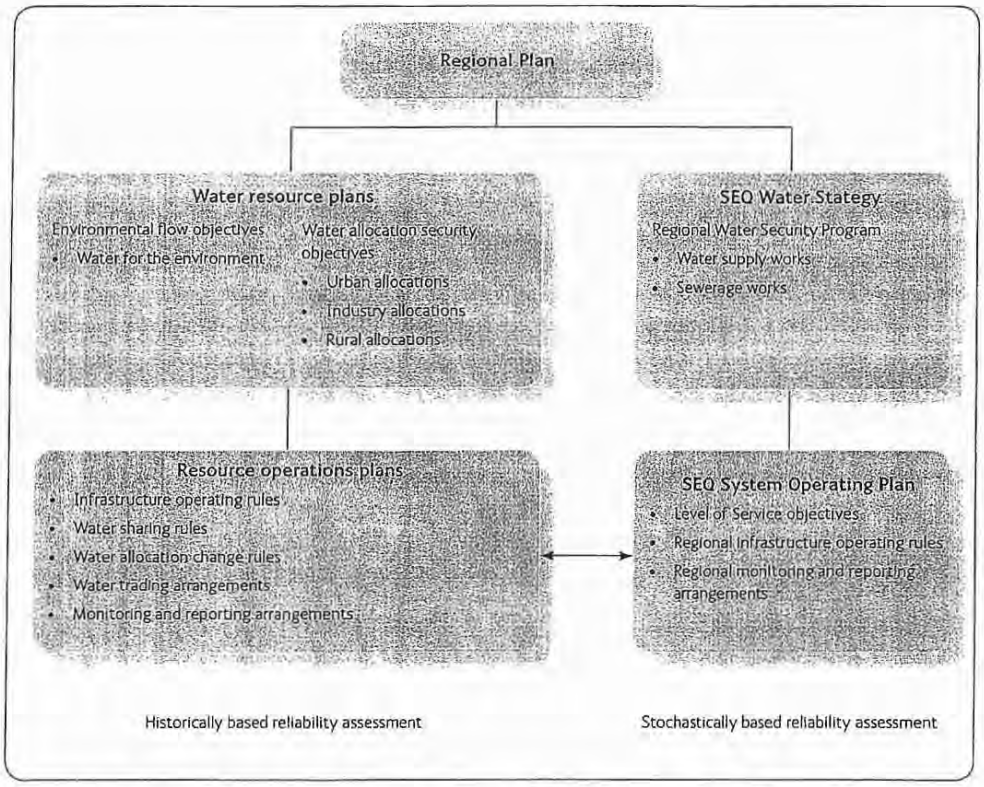


Figure 2.3 Relationship between water resource planning and the SEQ System Operating Plan

The water resource plans for the Mary Basin and Moreton are the only plans for SEQ that apply to groundwater. Declared sub-artesian areas, defined in the Water Regulation 2002, exist over Moreton Island and North Stradbroke Island.

The Strategy complies with the water resource plans. Section 3.1.3 discusses the importance of resource operations plans in achieving the desired supply reliability stated in the Strategy planning framework.

Water for the environment

Water resource plans specify a range of general and ecological outcomes. For example, some of the water resource plans for SEQ contain ecological outcomes that seek to minimise changes to the delivery of fresh water sediment, nutrients and organic matter to Moreton Bay. Monitoring and reporting programs will be established under the resource operations plans to assess whether or not water resource plans are achieving these outcomes.

In large part, the ecological outcomes are achieved by ensuring that actual flows meet or exceed specified environmental flow objectives. The environmental flow objectives are specified for high, medium and low flow regimes, and take into account seasonality. Wherever possible, environmental flow objectives attempt to mimic the natural flow regime of a catchment system.

In SEQ, environmental flows will exceed the minimum specified in water resource plans, because:

- each water resource plan identifies unallocated water that is available for urban or rural use. Until this water is fully granted, it would appear as surplus system flow (refer to Section 5.4.2)
- the SEQ Water Grid Manager will use less than the full urban water allocation to achieve the LOS objectives described in Chapter 3. This will increase the operating level of urban water supply dams, therefore increasing the potential frequency and volume of dam overflows to the environment.

The environmental flow objectives and water allocation security objectives included in the water resource plans are based on the historical record. The impacts of climate variability and change will be taken into account as part of future reviews of the plans.

Water for urban and rural use

Water resource plans also provide a level of security to water allocation holders, by establishing water allocation security objectives. These objectives define minimum performance levels that should be achieved through the implementation of operational and management rules specified in the relevant resource operations plans. The water allocation security objectives take into account any unallocated water that may be released for urban or rural use in the future.

There are a range of high priority and medium priority water entitlements from supplemented water supply schemes and some unsupplemented water entitlements. A supplemented water supply is one that is made more reliable by releases of stored water, such as from dams. Supplemented water supplies are managed by water supply scheme operators, such as Seqwater. An unsupplemented supply is one that is not sourced by releases of stored water. Unsupplemented supplies are managed by the Department of Environment and Resource Management.

In SEQ, most water resource plans specify that supply reliability[1] for high priority water allocations must be at least 95 per cent. Medium priority water allocations will generally have a lower reliability of supply. These performance levels reflect the nature of the use, with high priority allocations being suitable for urban and industrial uses and medium priority allocations being appropriate for rural uses.

For supplemented systems, announced allocation rules will generally be used to share water between allocation holders. Water trading rules will be specific to each plan and will generally apply to only supplemented water allocations in the initial resource operations plans. Water trading is intended to encourage water use efficiency and business development by enabling water allocation holders to sell, lease or seasonally assign spare water.

Groundwater

The *Water Act 2000* is the primary tool for management of groundwater extraction in Queensland.

Regulated groundwater areas have recently been identified in the water resource plans for the Mary and Moreton catchments. These mainly affect existing irrigation supplies. Bores for domestic use in SEQ are regulated on an as-needs basis.

Water bores may require a development permit under the *Sustainable Planning Act 2009* before they can be constructed. This ensures that these works are constructed properly and do not pose a risk to public safety or to the groundwater resource. Generally, the permit is required for all purposes except for stock water and domestic use.

2.1.4 Waterway health

Environmental values for water are set under the *Environmental Protection (Water) Policy 2009*. Objectives are set for key water quality parameters to protect these values, such as the percentage of sea grass coverage in parts of Moreton Bay or levels of nitrogen or phosphorus. These values provide a common set of goals to help integrate planning and management decisions.

The SEQ Healthy Waterways Partnership is a whole-of-government, whole-of-community collaboration. It focuses on leadership, commitment and voluntary cooperation to understand, plan and manage the use of SEQ's waterways and catchments. The program aims to complement other strategies and plans, including the Regional Plan, the Strategy and natural resource management plans.

The SEQ Healthy Waterways Partnership released the final version of the *SEQ Healthy Waterways Strategy 2007–2012* in 2008. The Healthy Waterways Strategy includes separate issue-based action plans regarding point source pollution, non-urban diffuse pollution, water-sensitive urban design, coastal algal blooms and protection of high conservation areas.

The Queensland Government released the draft State Planning Policy for Healthy Waterways for consultation in November 2009. The policy is intended to ensure that urban development is planned, designed and managed in ways that protect the environment.

[1] This means the percentage of months of being able to take the full water allocation over the historical simulation period. Not being able to take the full water allocation in any month does not mean that no water is available in that month, but rather that the full water allocation could not be taken for that month.

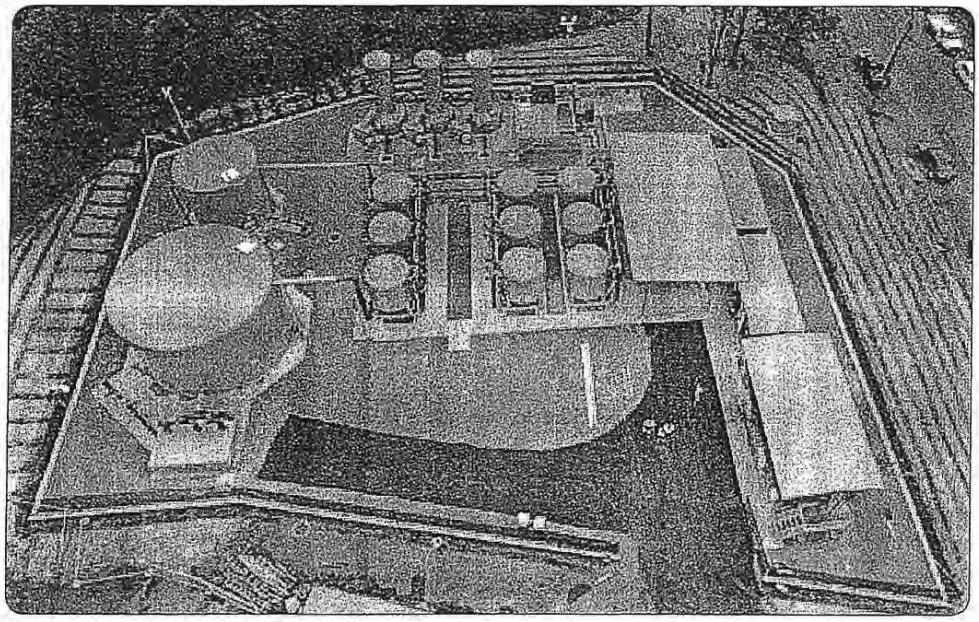
2.1.5 Drinking and recycled water quality

Drinking water quality in Queensland is regulated by the *Water Supply (Safety and Reliability) Act 2008*, the *Public Health Act 2005* and their accompanying regulations and guidelines. These Acts provide a framework for managing and ensuring the safety of drinking water supplies.

These regulations are based on the *Australian Drinking Water Guidelines*. The *Australian Drinking Water Guidelines* are designed to provide an authoritative reference on what defines safe, good quality water, how it can be achieved and how it can be assured. They address health and aesthetic issues and include guideline values for water quality parameters.

The *Water Supply (Safety and Reliability) Act 2008* and the *Public Health Act 2005* also establish a regulatory framework to ensure that recycled water schemes produce water of a quality that is suitable for its intended use. The Acts apply to all new and existing schemes across Queensland, including the Western Corridor Recycled Water Scheme.

These regulations are based on the *Australian Guidelines for Water Recycling: Managing Health and Environmental Risks.*



Brisbane Water, Runcorn Water Treatment Plant
Copyright 2007 Brisbane Caboolture Aquifuture Alliance
Photo courtesy of Brisbane City Council

2.1.6 National Water Initiative

The National Water Initiative (NWI) is an inter-governmental agreement between the Commonwealth of Australia and all states and territories. The overall objective of the NWI is to achieve a nationally compatible system of managing surface and groundwater resources for rural and urban use—a system that optimises economic, social and environmental outcomes and is based on markets, regulations and planning. In particular, the National Water Initiative seeks to:

- progressively remove barriers to water trading and to broaden and deepen the water market with the creation of an open trading market
- improve confidence for those investing in the water industry due to more secure water access entitlements; better and more compatible registry arrangements; better monitoring, reporting and accounting of water use; and improved public access to information
- return all currently over-allocated or overused systems to environmentally sustainable levels of extraction

- make water planning more sophisticated, transparent and comprehensive to deal with key issues such as the interaction between surface and groundwater systems, and the provision of water to meet specific environmental outcomes
- more efficiently manage water in urban environments—for example, through the increased use of recycled water and stormwater.

2.2 Institutional arrangements

The Queensland Government is implementing wide-ranging institutional reforms in the water industry in SEQ.

The reforms were required in order to realise the benefits of the SEQ Water Grid, ensuring the efficient and effective operation of the diverse range of supply sources. The previous arrangements were fragmented, with bulk source, transport and treatment assets being owned by 25 different entities. Customer service standards and water pricing were variable, there was no means of equitably sharing the cost of new infrastructure across the beneficiaries, and there was minimal transparency in the structure and level of water pricing.

The first phase of reform implementation was completed on 1 July 2008 with the establishment of the four new entities that own and operate the SEQ Water Grid (refer to Figure 2.4). These entities are:

- Seqwater, which owns all dams, groundwater infrastructure and water treatment plants in SEQ
- WaterSecure, which owns the desalination plant at the Gold Coast and the Western Corridor Recycled Water Scheme
- Linkwater, which owns all major pipelines in SEQ
- the SEQ Water Grid Manager.

These entities are all Queensland Government–owned statutory authorities.

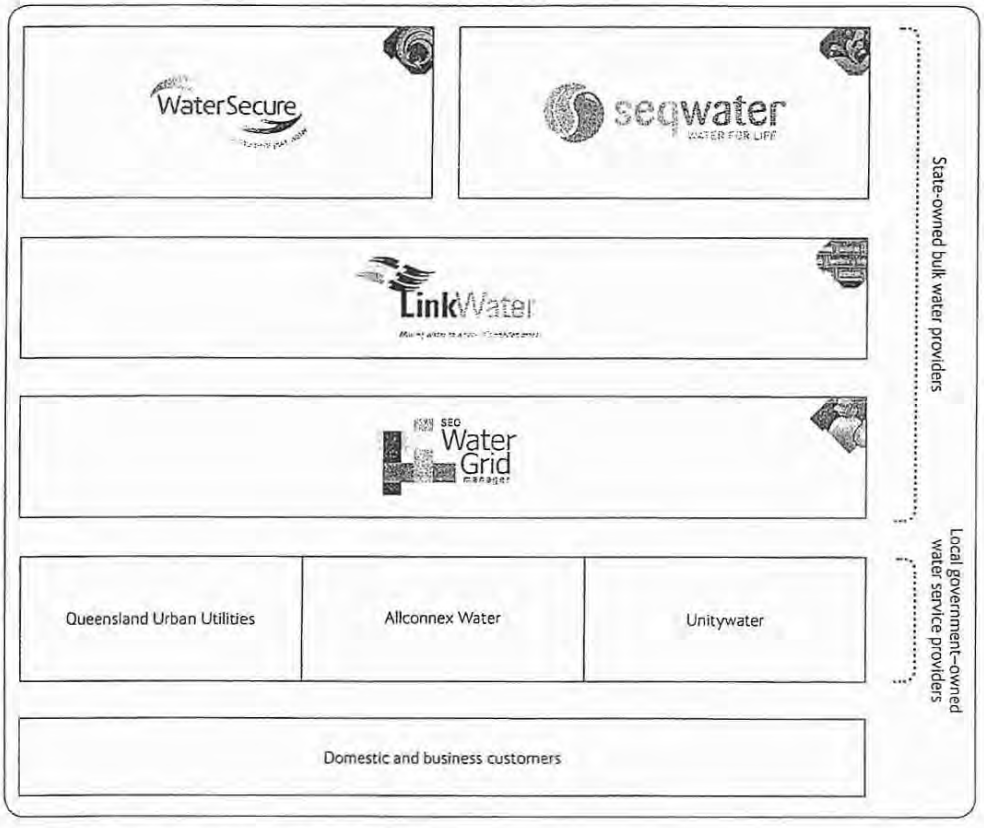


Figure 2.4 Institutional arrangements

The second stage of the reforms was completed on 1 July 2010, when three new council-owned distribution and retail entities commence operation. These entities own the water and sewerage distribution infrastructure and sell water and sewage disposal services to customers. The new entities are owned by the following councils and provide services within their areas (see Figure 2.5):

- Unitywater, servicing the Sunshine Coast and Moreton Bay areas
- Queensland Urban Utilities, servicing the Brisbane, Scenic Rim, Ipswich, Somerset and Lockyer Valley areas
- Allconnex Water, servicing the Gold Coast, Logan and Redland areas.

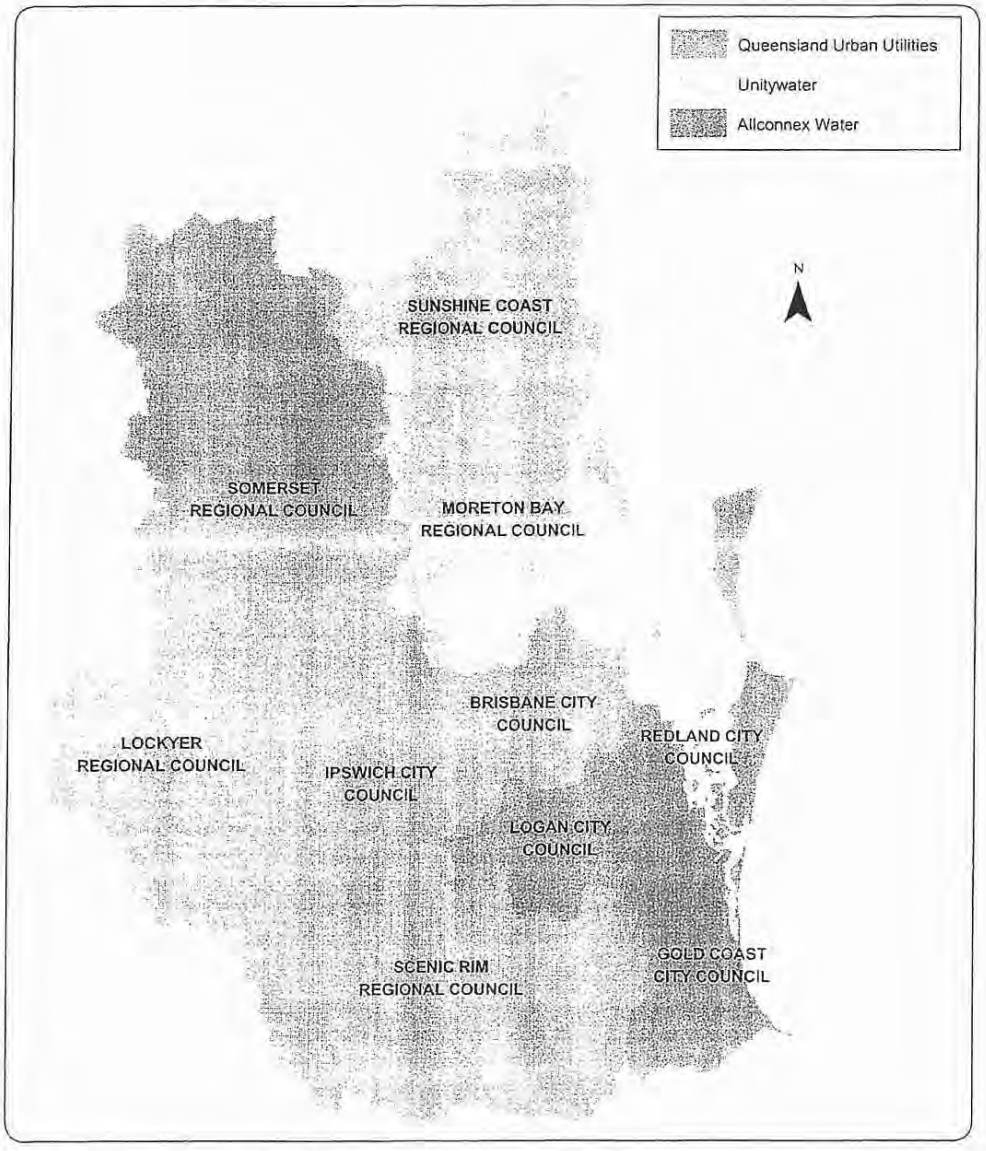


Figure 2.5 Boundaries of the three council-owned distributor-retailers

The SEQ Water Grid Manager is responsible for directing the physical operation of the SEQ Water Grid. The SEQ Water Grid Manager optimises the scheduling of supply from each source, taking into account a range of factors, including system reserves, dam inflows, operating costs, water quality and risk management.

The SEQ Water Grid Manager also provides a mechanism to share the costs of the SEQ Water Grid, by acting as the single buyer of bulk water services and the single seller of bulk water for urban purposes. It sells a wholesale 'pool' product, reflecting the portfolio cost of supplying retailers with a defined security and quality of supply at a defined bulk supply node.

Case study: Regional approach to maintaining a quality water service

On 29 December 2008, the SEQ Water Grid Manager was notified that residents in the south and west of Brisbane and some parts of Ipswich were experiencing changes to the taste, colour and odour of their tap water.

This was due to high summer temperatures, intense summer storms and seven years of extreme drought conditions. In combination, these factors increased the amount of soluble and insoluble inorganic and organic compounds flowing into water supplies at Mt Crosby. This elevated the levels of naturally occurring organic compounds, such as manganese and geosmin in the water. These organic compounds altered the colour and taste of the drinking water from the Mt Crosby Water Treatment Plant; however, the tap water continued to meet the strict health requirements of the *Australian Drinking Water Guidelines*.

The SEQ Water Grid Manager worked with four Grid participants to manage the water quality incident. Actions included:

- increasing the production of water from North Pine Water Treatment Plant
- flushing the Mt Crosby Weir with fresh water
- transferring 50 million litres of water a day from the Gold Coast to blend with Mt Crosby water
- transferring 20 million litres of water a day from the Gold Coast to Logan.

These measures resulted in reduced manganese and geosmin levels, improving the taste and odour of the tap water for Brisbane and Ipswich residents.

By 14 January 2009, test results confirmed that the concentration of organic compounds and minerals in the water at the Mt Crosby Water Treatment Plant was back to normal levels and below the *Australian Drinking Water Guidelines* aesthetic threshold.

Beyond the physical operation of the SEQ Water Grid, the reformed institutional arrangements have the potential to deliver significant benefits to the community by:

- improving and simplifying business structures to deliver water services in a coordinated manner
- creating economies of scale and scope due to the reduced number of entities
- improving service delivery by specialist entities, with the amalgamation of technical skill sets
- clarifying the respective roles of state and local governments
- improving the transparency and accountability for bulk transport and distribution networks with a strong asset management regime
- enhancing economic regulation and pricing.

The ability to introduce competition was a consideration in developing the new arrangements. Scope for practical competition will be actively assessed as part of the significant policy and regulatory reform agenda being undertaken by the QWC. While the SEQ Water Grid Manager is a monopoly service provider in the short term, some scope for the sale of bulk water directly to SEQ Water Grid customers by suppliers will be established at an early stage. This bypass mechanism is likely to see the development of new supply sources, particularly for localised solutions such as dual-reticulation recycled water schemes.

The SEQ Water Grid Manager can also enter into urban and rural water contracts. The Queensland Government has previously announced that recycled water will be made available from the Western Corridor Recycled Water Scheme to Lockyer Valley irrigators when not required to meet urban supply requirements (refer to Section 6.6.3). Additional supplies could also be made available from the SEQ Water Grid for rural production when not required to meet urban needs, such as through temporary or seasonal supply. Temporary allocations would be made available through a competitively neutral and transparent process. Any sales would be required to recover the cost of supply and not disadvantage other system users.

2.3 Total water cycle planning

The regional framework for total water cycle planning is set out in Section 11 of the Regional Plan. This section provides further detail on implementing this framework in SEQ.

The Strategy seeks to optimise total water cycle outcomes by:

- using and managing all water resources sustainably and within water resource plan limits
- introducing a demand management program to ensure that we continue to conserve our precious water resources
- considering all potential water sources, including possible future purified recycled water schemes and local recycling and stormwater schemes
- establishing new design standards for development, including for water efficiency and provisions of alternative supply sources
- recognising the importance of catchment management in protecting public and ecosystem health.

The following text box explains the framework for total water cycle management.

Framework for total water cycle management in SEQ

Total water cycle management (TWCM) involves the integration of land use and infrastructure planning across SEQ as a whole and for major development areas, local areas and specific sites. Key features of total water cycle management planning include:

- water efficiency and recycling
- integrated management of urban and rural water
- water-sensitive urban design in development
- stormwater management to improve water quality and water supply and to minimise the alteration to natural flow regimes
- a focus on catchment management to protect drinking water supplies and waterways from pollution.

Total water cycle management needs to be considered at a number of scales, with the planning process and the focus of investigations differing for each. For instance, regional planning focuses on regionally significant outcomes and infrastructure, such as the LOS objectives for water supply. At the other extreme, on-site development involves delivering built outcomes such as rainwater tanks, stormwater reuse or water-efficient devices.

Figure 2.6 illustrates the scales of planning and the key planning focus for each. At each scale, the planning requirement sets the context for planning at the scale below. At the more strategic levels, planning should not be unnecessarily prescriptive. Rather, target outcomes should be specified only where they are regionally significant.

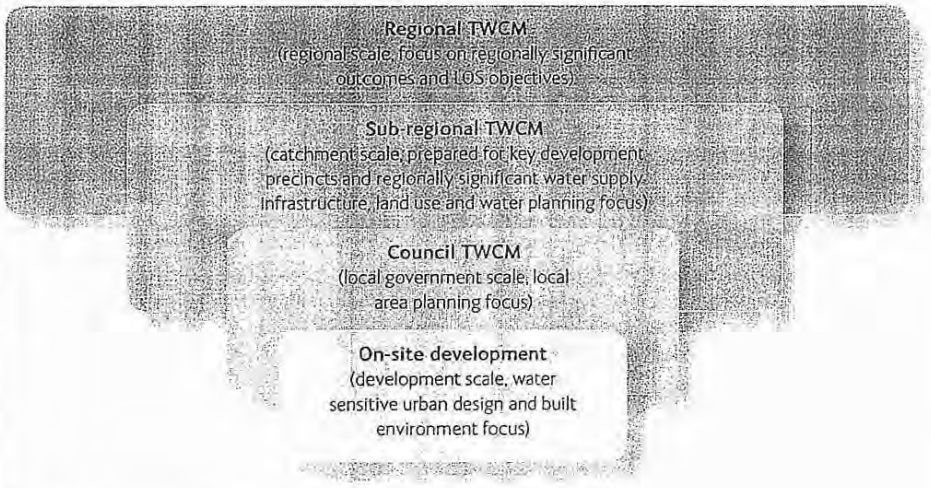


Figure 2.6 Framework for total water cycle management

Regional scale

The Queensland Government is responsible for overarching water management in SEQ. This responsibility involves a range of regional policies and initiatives, including the *South East Queensland Regional Plan*, the Strategy and the *South East Queensland Healthy Waterways Strategy 2007-2012*. These policies and initiatives are reviewed on a regular basis.

Sub-regional scale

Sub-regional total water cycle plans will be prepared for key development precincts, and where regionally significant water supply infrastructure is located. The purpose of these plans is to integrate land use planning with planning for waterway health and urban and rural supply purposes.

Sub-regional total water cycle plans will be led by the QWC, in conjunction with the local distributor-retailer entity and local governments.

The plans will build on and integrate existing processes undertaken by a range of entities. The key processes are:

- water resource planning, led by the Department of Environment and Resource Management
- specification of environmental values and water quality objectives, led by the Department of Environment and Resource Management
- water supply planning, led by the QWC
- drinking water catchment protection, led by councils and Seqwater
- recycled and wastewater infrastructure planning, led by councils and the distributor-retailers
- overland flow and flood management, led by the Department of Environment and Resource Management and local governments
- land use planning and development assessment, led by the Department of Infrastructure and Planning and local governments
- rural community planning, led by the Department of Infrastructure and Planning and the Department of Employment, Economic Development and Innovation.

The plans will include key decisions about the scope of possible future purified recycled water schemes, local recycling for non-potable uses, development controls to protect water quality, and stormwater capture and use. The plans could lead to the imposition of requirements on the way in which development is delivered and on any local supply solutions, in order to achieve optimal overall outcomes.

The outcomes from sub-regional total water cycle planning will be recommended for inclusion into the Regional Water Security Program. The Program will list key infrastructure and outcomes that should be incorporated into planning schemes and supporting documents.

Local governments will continue to have a controlling influence over local water cycle management through the preparation of planning instruments such as priority infrastructure plans.

The QWC is finalising a sub-regional water cycle plan for key development areas located within the boundaries of the Logan City Council and Scenic Rim Regional Council. This plan is being undertaken in partnership with the two councils, the SEQ Healthy Waterways Partnership and relevant Queensland Government agencies. Water-related issues affecting the area, include:

- providing water supplies for existing and new land uses, including for rural production
- managing sewage and stormwater discharges from existing and new developments
- protecting water supply catchments.

The plan will assess local supply solutions, as addressed in Section 4.6 of the Strategy. It will also consider opportunities to minimise the cost of, and energy used by, water cycle infrastructure. These issues are not council area specific and involve a number of entities. Some need to be resolved quickly to enable urban development to proceed, while others are associated with the operation and health of the Logan River system and require a long-term commitment to improving the management of resource and catchment issues within that system.

Future plans will be prepared in the short term for the key development and identified growth areas within the Moreton Bay region, Caloundra South and Palmview within the Sunshine Coast region and Ripley Valley within the Ipswich region. Other sub-regional plans will be prepared for key development and growth areas within the Regional Plan on a progressive basis.

Council scale

Under the *Environmental Protection (Water) Policy 2009*, local governments are required to develop total water cycle management plans that will guide their operating principles and decision making at the local level. Council total water cycle management plans must be developed in accordance with the guidelines being prepared by the Department of Environment and Resource Management. They will generally include provisions for integrating urban water services, including water supply, sewerage, trade waste and stormwater management. Among other things, they will address harvesting of rainwater and stormwater, wastewater recycling and water-sensitive urban design.

Council total water cycle management plans generally cover a larger spatial area than sub-regional total water cycle plans and will provide a higher level of detail to guide decision making for future planning.

On-site scale

At the on-site scale, development should comply with the planning framework outlined above and other requirements, such as the Queensland Development Code and state planning policies.

In recent years, some local governments in SEQ have incorporated water-sensitive urban design into these requirements, often in partnership with developers.

Water-sensitive urban design is a planning and design approach that integrates water cycle planning management into the built form of houses, allotments, streets, suburbs and master-planned communities. Among other things, water-sensitive urban design seeks to avoid or minimise the impacts of development by:

- protecting and enhancing the intrinsic values of the natural water cycle by minimising disturbance to natural landforms, wetlands, watercourses and riparian zones
- protecting surface and groundwater quality
- reducing downstream flooding and drainage impacts on aquatic ecosystems by managing stormwater run-off and peak flows
- promoting more efficient use of water by providing access to alternative local supplies of water, such as recycled water or stormwater
- minimising wastewater generation and ensuring treatment of wastewater to a standard suitable for wastewater reuse or release to receiving waters
- controlling soil erosion during construction and operational phases
- providing localised water supply solutions.

These initiatives complement Regional Plan requirements. The *Regional Plan Implementation Guideline Number 7* specifies design objectives for best practice urban stormwater management and describes how they should be adopted. The design objectives address three components of urban stormwater that affect water quality and waterway health:

- frequency of urban stormwater flows
- magnitude and duration of urban stormwater flows
- loads of sediment, nutrients and litter in urban stormwater.

The *Water Sensitive Urban Design Technical Design Guidelines for South East Queensland* describe appropriate methods for the detailed design of some common structural stormwater management measures.

2.4 The challenges we face

The Strategy seeks to ensure that SEQ has a safe and secure water supply. The social and economic consequences of an unreliable water supply or a failure of supply are unacceptable.

In providing this security, a balance needs to be struck between the outcomes sought by various stakeholders, which are not always well aligned. Some examples include:

- providing sufficient regional water security while minimising social, environmental and economic impacts
- providing sufficient water without over-capitalising on excess supply capacity
- improving water use efficiency while maintaining adequate supplies to support the SEQ community's lifestyle expectations

- providing improved access to water supplies for rural production while maintaining user-pays principles
- ensuring that the recommended infrastructure programs are sufficiently flexible to respond to uncertainty and, in particular, climatic risk.

Figure 2.7 illustrates the key considerations that have been taken into account in preparing the Strategy and the broad outcomes sought. The Strategy must specifically address the following key challenges.

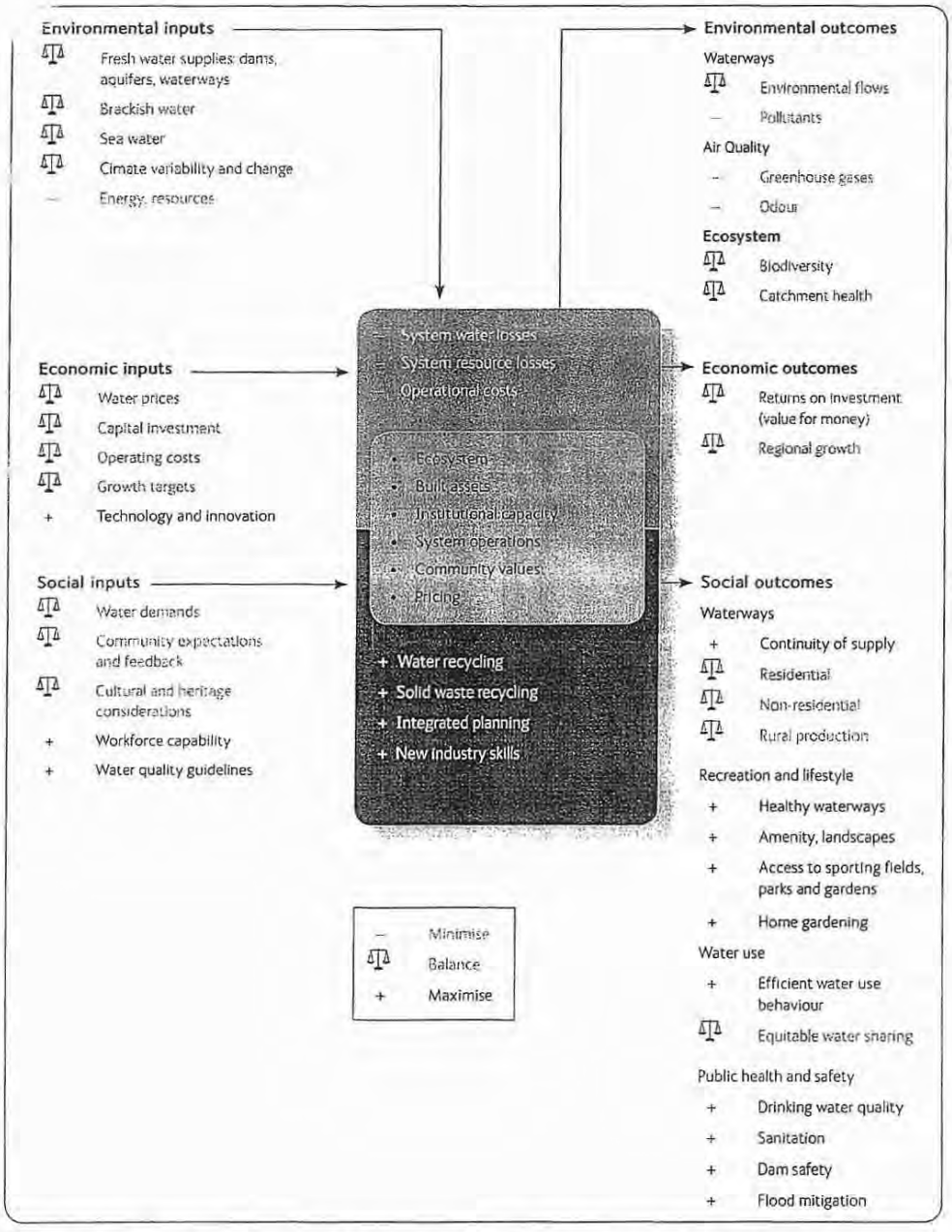


Figure 2.7 Key considerations and outcomes sought in preparing the Strategy

2.4.1 Population growth and demand trends

SEQ is forecast to continue to grow (refer to Table 2.1). Given the past trends, the Strategy has been prepared on the basis that future population growth in SEQ will trend between the medium and high series projections. Based on a high series projection, the population of SEQ could surpass six million people by 2051.

If SEQ residents were to return to pre-drought water usage of nearly 300 litres per person per day, regional water demand would double within the next 30 years, based on high series population forecasts. However, the community's response to the current drought has demonstrated that implementing simple behavioural changes, supported by basic water efficiency devices, can result in substantial water savings—reducing and deferring the need for additional infrastructure.

Table 2.1 Medium and high population projection series

Year	Population	
	Baseline	
2008[1]	3 043 100	
	Medium series	High series
2011	3 214 700	3 290 300
2016	3 567 100	3 737 200
2021	3 898 100	4 179 900
2026	4 204 700	4 609 300
2031	4 495 700	5 024 200
2051[2]	5 492 200	6 636 200
2056[3]	5 696 300	7 014 700

[1] Includes Toowoomba and Cooloola

[2] Sourced from the Planning Information and Forecasting Unit (PIFU), Department of Infrastructure and Planning. SEQ forecasts from 2006 to 2051; Queensland's future population 2008 edition (2008)

[3] SEQ forecasts 2051 to 2056: PIFU consultancy (2008) for all local governments but Toowoomba and extrapolation for Toowoomba; and Cooloola: Queensland's future population 2006 edition (2006)

2.4.2 Climate variability and change

The more we learn about the climate system, the more we are aware of its unpredictability.

Australian Bureau of Meteorology studies indicate that Queensland's climate is changing, becoming drier and hotter since 1910. Australian Bureau of Meteorology and CSIRO studies also suggest that the region is heading into a period of increased climate variability, potentially with drought occurring more often and for longer periods.

Research on the impact of climate change on inflows has been undertaken for the catchment areas in the western parts of SEQ, including Wivenhoe and Somerset dams. Case studies involving a number of global climate models and higher resolution regional climate models indicate a range of possible climate change outcomes by 2030. Mean temperatures in the western parts of SEQ could increase by between 0.8°C and 1.2°C, evaporation could increase by 2 per cent to 8 per cent, and annual rainfall could reduce by 5 per cent or increase by 20 per cent. The annual stream flow for the Brisbane River downstream of Mt Crosby Weir could be reduced by up to 28 per cent in a dry scenario or increased by up to 14 per cent in a wet scenario.

Even small changes in climate could have significant impacts for water security. Figure 2.8 shows the historical record for rainfall and combined inflows for two key storages in the SEQ region. It illustrates that, from the start of the Federation Drought through to the early 1950s, average rainfall was only slightly lower than during the second half of the century. However, inflows were, on average, substantially lower in the first half of the twentieth century than the second. This demonstrates the significant impacts of slight changes in rainfall on catchment wetting and drying and the effect of patterns of rainfall within a year, particularly the intensity of rainfall leading to run-off.

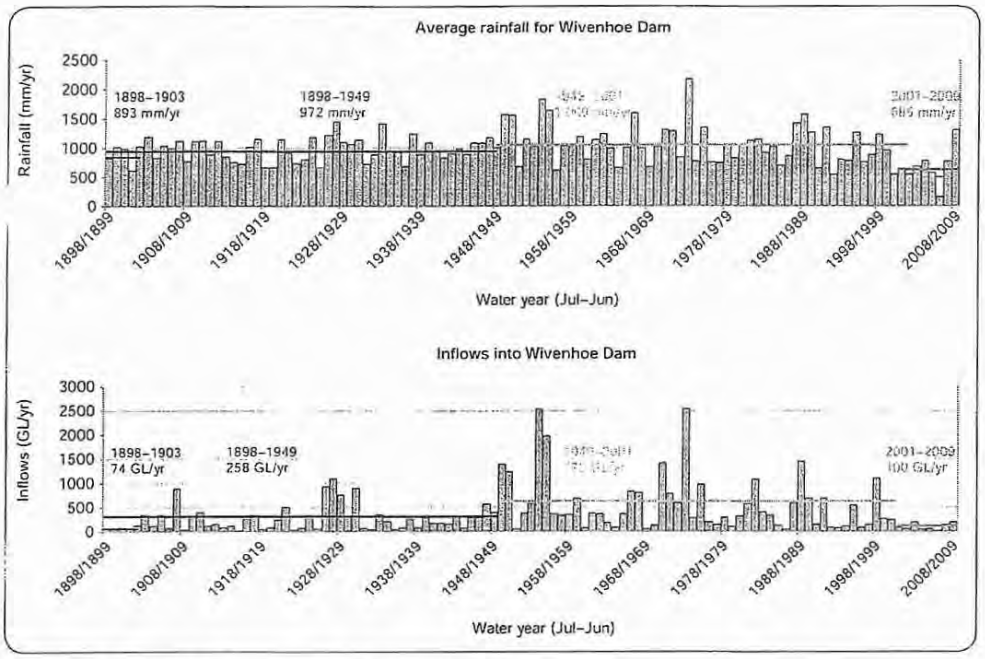


Figure 2.8 Rainfall and inflows into Wivenhoe Dam

Note: Average rainfall is the mean rainfall from the Wivenhoe and Somerset rain gauges.

Considerably more analysis is necessary to improve our understanding of climate change impacts, with the impacts expected to be highly variable across the region. Such work is being done by the Queensland Government Climate Change Centre of Excellence and the SEQ Urban Water Security Research Alliance.

The challenge is to ensure that water security planning accommodates drought impacts and maintains sufficient flexibility to adapt as climate change science improves. This is particularly important in SEQ, given our current high reliance on surface water supplies. The challenge for the SEQ community is to recognise that our regional water supply planning will continue to evolve as our understanding of climate change science improves.

The Federation and Millennium droughts

From 2001 to 2009, SEQ experienced the worst drought in the region's recorded history in terms of both length and reduced run-off: the Millennium Drought. On 20 May 2009, Wivenhoe, Somerset and North Pine Dams reached 60 per cent of their combined capacity, signalling an end to the water security crisis for SEQ.

Until the Millennium Drought, the Federation Drought was the worst drought in Australia's recorded history. Figure 2.9 illustrates the difference between the accumulated rainfall deficits across the catchment area to the west of Brisbane during the Millennium and Federation droughts. Accumulated rainfall deficit is the difference between rainfall over the drought period and average rainfall.

SEQ suffered the Federation Drought for five years from 1898 to 1903. At its worst, the accumulated rainfall deficit reached 1278 mm.

In comparison, the SEQ Millennium Drought ran for nearly eight years from 2001 to 2009. The maximum accumulated deficit during the period was 1530 mm.

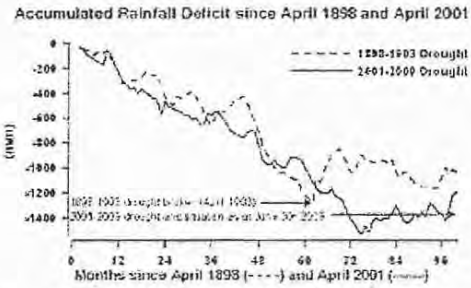


Figure 2.9 Accumulated rainfall deficit for the Federation and Millennium droughts

Source: Prepared by the Queensland Climate Change Centre for Excellence, July 2009

The El Niño-Southern Oscillation

The El Niño-Southern Oscillation (ENSO) phenomenon was a major contributor to the Millennium Drought, with El Niño events in 2002–03, 2004–05 and 2006–07.

ENSO is a global phenomenon that has a strong impact on Australian rainfall, particularly summer rainfall in Queensland. ENSO involves interplay between the ocean and atmosphere, which sets up a see-saw-like fluctuation in air pressure and sea surface temperature across the eastern and western Pacific. One extreme of this fluctuation is known as El Niño and the other extreme as La Niña. The fluctuation tends to lock into one mode (either El Niño or La Niña, or a more neutral mode) for several months—typically from spring through to the end of summer.

El Niño events tend to lead to dry summers in Queensland due to a reduced onshore flow, fewer tropical cyclones (particularly in southern Queensland) and a less active and less extensive monsoon system. Opposite conditions tend to occur during La Niña events.

ENSO has not been the only factor contributing to the dry conditions experienced in SEQ. Rainfall in SEQ is also influenced by both tropical systems from the north and fluctuations in the high-pressure ridge to the south. Interaction of these phenomena throws significant uncertainty around rainfall projections and long-term climate behaviour of the SEQ climate system. As a result, the impact of El Niño or La Niña differs somewhat from one event to the next. Another factor influencing the duration and intensity of drought, and the impact of ENSO, is variability in climate over long cycles. The SEQ Urban Water Security Research Alliance is undertaking research in this area, including a project on the Inter-decadal Pacific Oscillation.

Modified from: The South East Queensland Drought to 2007, Queensland Climate Change Centre of Excellence, 2007.

2.4.3 Efficient operation

The SEQ Water Grid provides the capacity to manage water supply on a regional basis. The challenge is to operate the SEQ Water Grid in a cost-effective and efficient manner for the SEQ community, while still achieving regional water security objectives.

Prior to the establishment of the SEQ Water Grid, the region was supplied as eight largely discrete water supply zones, with differing levels of reliability and, until recently, different owners and operators. Due to the lack of connectivity, restrictions were frequently applied in parts of the region while dams in other parts might have been full or overflowing. For instance, a severe drought was experienced on the Gold Coast in 2002, resulting in the application of severe restrictions and planning for the construction of a pipeline from Brisbane. A few years later, Brisbane was experiencing the most severe drought on record while dams on the Gold Coast were overflowing.

The SEQ Water Grid allows risk to be managed on a regional level, rather than on an individual storage or system basis. It allows optimal location of drought storage reserves and allows water to be moved from areas of surplus to areas that face a shortfall.

Conversely, when dam levels are high, the SEQ Water Grid Manager can reduce operating costs and energy consumption by:

- reducing production from expensive and energy-intensive sources, which are generally the climate resilient water sources
- 'mothballing' or reducing production from small supplies, such as aquifer projects
- altering the rate of transfer through major interconnections
- selling water to irrigators or adjoining areas on an interruptible basis.

2.4.4 Rural water supplies

The Regional Plan identifies around 80 per cent of the region as Regional Landscape and Rural Production Area. A portion of this area comprises protected national and conservation parks, water storages and state forests. However, the majority is privately owned farmland.

For the rural production sector in SEQ, access to water and the cost of that water has proven to be a major challenge. This challenge has been compounded because:

- there are thirteen sub-catchments in SEQ, which fragment potential water delivery schemes and make movement of water from one area to another difficult and expensive
- rural producers are required to provide increasing levels of certainty to major purchasers, which is difficult to provide without secure water.

These characteristics create a unique set of challenges to be overcome when developing a rural water supply strategy that aims to meet the objectives of the Regional Plan.

With SEQ now out of drought, the QWC can investigate options to increase the availability of water for rural irrigation. These investigations will be a key focus for 2010 and 2011, and are described in Section 6.6.

2.4.5 Potential water supplies

Planning for future bulk water supplies presents several challenges.

Additional bulk water supplies to meet growth might be required in 2021, and most likely not until mid-2020s. However, as the population continues to grow, competition for land is rapidly increasing. Planning for future water infrastructure requires site investigation and preservation well ahead of future need. Sufficient land must be preserved for potential future water supply options, including interconnections, with the least possible impact on adjacent communities. Pre-planning can also reduce the time required to construct any new water infrastructure.

All remaining potential bulk water supplies must be investigated in detail, including climate resilient options such as desalination and purified recycled water. There are few sound opportunities for further development of major surface water storages in the region. This is due to the shortage of suitable sites in areas identified by the water resource plans as having reliable water inflows. Groundwater is also almost fully developed, apart from smaller opportunistic extractions.

Rainwater tanks and alternative local supplies must also be investigated in detail. Some of these alternatives have the potential to exceed the minimum savings required under the Queensland Development Code, or to deliver the minimum savings more efficiently. However, they must be compared to other options on a triple bottom line basis. More research is needed to quantify the benefits and costs of these alternatives, and to ensure that they are capable of consistently supplying fit-for-purpose water quality.

Finally, there is a need for a robust and transparent process by which the QWC will prepare advice for the Queensland Government regarding the nature, location and timing of the next augmentation.

2.4.6 Our environment

SEQ contains some of the most valuable waterways and estuaries in Queensland. These waterways and estuaries are affected by a range of factors associated with human settlement, such as:

- altered environmental flows from water resource development and changes in land uses
- polluted run-off and degradation of riparian zones from urban or rural development
- point source pollution from wastewater treatment plants and industry
- in-stream sand extraction and erosion of river banks
- fishing.

The SEQ Healthy Waterways Partnership publishes an annual Report Card on waterway health. The Report Card demonstrates that these factors have caused degradation to a number of rivers and estuaries, despite some major achievements over the past decade, An increasing population, together with substantial industrial growth, will put more pressure on ecosystem health.

To restore our waterways, new development must be designed to protect water quality and flows, existing uses must be better managed, and degraded areas must be rehabilitated. These challenges highlight the importance of total water cycle management, as explained in Section 2.3. Section 4.6.3 describes some of the direct environmental benefits that can be achieved to reduce nutrients in waterways, through the use of well-planned water recycling.

Chapter 3

Striking the balance —Methodology

This chapter provides an overview of the planning framework that underpins the Strategy. It explains the approach to water security planning in SEQ, and the Level of Service (LOS) objectives that have been adopted. It also provides an explanation of how the SEQ Water Grid will be operated to achieve the LOS objectives. Finally, the chapter provides an overview of the methodology for demand forecasting and comparing alternative demand and supply options.

Key messages

- LOS objectives provide a basis for planning and managing SEQ's water resources.
- LOS objectives include the duration, severity and frequency of water restrictions.
- The Strategy aims to achieve the LOS objectives for all communities with reticulated water supplies in SEQ. See Section 3.1.1 for the full list of LOS objectives.
- The potential impact of climate change has been analysed assuming an immediate 10 per cent decrease in the yield from dams and weirs.
- A drought response plan will be developed. The plan will require the introduction of Medium Level Restrictions and the construction of new climate resilient or climate independent water supplies, such as desalination plants, as necessary.

3.1 Urban water supply planning underpinning the Strategy

The SEQ Water Grid is an interconnected system of dams and weirs, groundwater, desalination and purified recycled water. Through optimal operations, the SEQ Water Grid provides a secure water supply. While the region will continue to have a high reliance on its surface water storages, the ability to introduce climate independent water into the system and draw on a variety of sources significantly improves the security of supply.

The Strategy adopts an analytical technique based on the LOS objectives approach, originally published by the Water Services Association of Australia in June 2005. This approach is reflected in the *Water Act 2000*, which requires the QWC to provide advice based on desired LOS objectives.

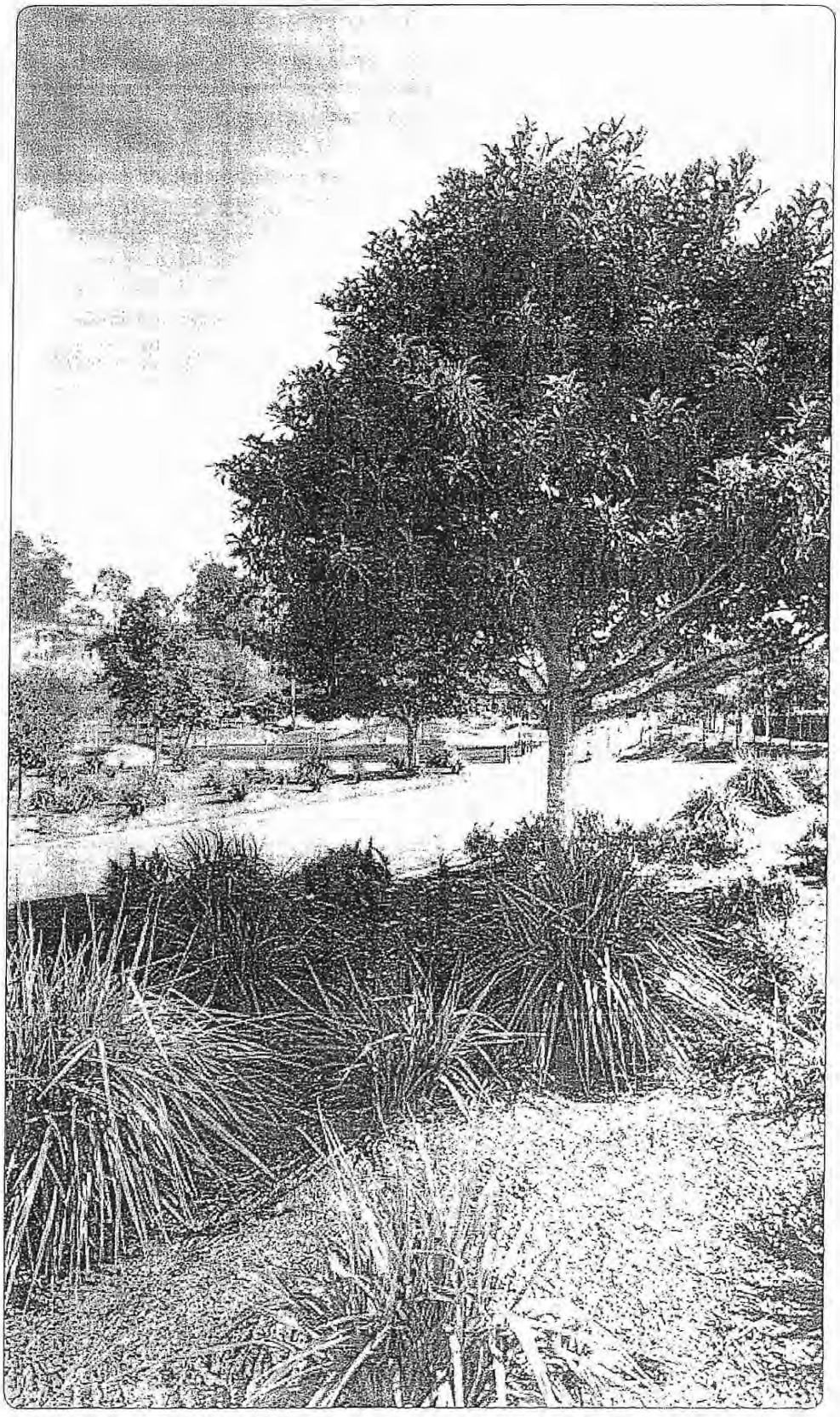
The LOS approach is intended to ensure that the community has a safe and reliable water supply, and that this is communicated to consumers. Water supply planning achieves this purpose in three ways:

1. The system has the capacity to maintain an adequate level of water supply over most periods in the long term.
2. When droughts occur, a drought response plan protects against water shortages through the planned implementation of Medium Level Restrictions and the construction of new climate resilient or climate independent supplies, such as desalination, as necessary.
3. In cases of extreme drought or critical water shortage, a contingency or emergency plan ensures that basic water needs for a community can be met for the duration of that situation.

The LOS approach involves:

- stochastically[1] generating longer time sequences of hydrologic data that have similar statistical characteristics to that of the historical record—this provides better information about climate variability and the potential for droughts worse than have occurred on record
- analysing climate models to assess potential reductions in surface water availability due to climate change
- reducing demand through cost-effective measures
- planning for future droughts as a core element of the planning process
- defining a yield for the SEQ Water Grid as a whole, such that water can be supplied at the specified LOS objectives.

[1] A stochastic model is a tool for estimating probability distributions of potential outcomes by allowing for random variation in one or more inputs over time. The random variation is usually based on fluctuations observed in historical data for a selected period using standard time-series techniques. For our model, the historical record was used to generate 1000 replicates of data with each replicate representing more than 100 years of inflow data.



3.1.1 Level of Service objectives

LOS objectives provide a basis for establishing a secure water supply. The objectives define:

- the desirable maximum frequency, duration and severity of water restrictions
- the average amount of water per capita that must be supplied in normal times.

The objectives are used to determine the volume of water that can be supplied from the SEQ Water Grid, on average, every year—this is the LOS system yield. The LOS system yield is used, together with the projected demands, to ensure that supply and demand initiatives are put in place to meet future water needs.

When the LOS system yield exceeds demand, there is a lower likelihood of triggering restrictions than is specified in the LOS objectives. When demand exceeds the LOS system yield, there is a higher likelihood that restrictions will be triggered.

LOS objectives should reflect community expectations about water restrictions and the community's willingness to pay for improved security of supply. The LOS approach acknowledges that future severe droughts will occur, and that water restrictions are an effective and efficient way of managing the impact of these droughts—but restrictions can have a significant impact on the community. The LOS objectives make clear the assumptions made by water supply planners, and will inform investment decisions by the community.

The LOS objectives for SEQ have been developed on the basis that, in order to maintain a comfortable lifestyle, the community would prefer to use Permanent Water Conservation Measures coupled with Medium Level Restrictions in times of drought. In normal times, this means that water will be used wisely. In periods of drought, Medium Level Restrictions will be introduced early enough and at such a level that they avoid negative impacts on community amenity and the regional economy. For instance, in future droughts, it is expected that restrictions would not require a ban on handheld hosing and water-efficient sprinklers.

The LOS objectives are listed below. The objectives will be targeted across all SEQ communities with reticulated drinking water supplies.

Level of Service objectives

- During normal operating mode, sufficient water will be available from the SEQ Water Grid to meet an average regional urban demand of 375 litres per person per day (including residential, non-residential and system losses).
- Sufficient investment in the water supply system will occur so that:
  - Medium Level Restrictions will not occur more than once every 25 years, on average
  - Medium Level Restrictions will only reduce consumption by 15 per cent below the total consumption volume in normal operating mode
  - drought response infrastructure will be not be required to be built more than once every 100 years, on average
  - combined regional storage reserves do not decline to 10 per cent of capacity more than once every 1000 years, on average
  - regional water storages do not reach 5 per cent of combined storage capacity
  - Wivenhoe, Hinze and Baroon Pocket dams do not reach minimum operating levels.
- It is expected that Medium Level Restrictions will last longer than six months, no more than once every 50 years on average.

On the basis of the LOS objectives, the community can expect to experience water restrictions no more than once every 25 years, on average. Such restrictions would reduce regional urban demand by an average of 15 per cent, across the entire community. In setting future Medium Level Restrictions, the QWC will consider the likely impact of the measures, community preference and the existing level of efficiency for residential and non-residential customers. Once business and industry have implemented best practice water efficiency, it is likely that additional savings will be made by the residential sector curtailing outdoor use. The QWC expects that residential consumption may be curtailed to a regional average of about 185 litres per person per day.

The QWC considers that these objectives represent appropriate planning assumptions, given the current variation in consumption across SEQ and the high level of uncertainty regarding population growth, impacts of climate change and a range of other factors. In particular, the QWC recognises the risk that consumption may rebound over a relatively short period of time, compared to the time required to plan and construct new sources of supply.

The LOS objectives will be reviewed as part of future reviews of the Strategy, taking into account a range of factors including the level of residential water use and community acceptance of continued water efficiency measures. For example, the QWC would consider reducing the overall demand planning assumption if average regional urban consumption remains significantly below 375 litres per person per day and community acceptance of continued water efficiency measures remains strong. An annual performance review of the Strategy provides the opportunity to review the overall demand planning assumption.

The planning assumptions are discussed in more detail in Section 4.3.

Establishing the LOS objectives has involved trade-offs between financial costs, environmental impacts and the willingness of the community to accept restrictions on a periodic basis. Information gained from managing the Millennium Drought has been used in the formulation of the LOS objectives. The experience of managing regional water security during the Millennium Drought has provided useful evidence about practical issues and community expectations. Feedback on the draft Strategy indicated that residents of SEQ generally support ongoing water efficiency measures and planning to ensure that water supplies are secure during extreme droughts.

3.1.2 Drought response planning

A drought response plan is required to achieve the LOS objectives. The purpose of the drought response plan is to ensure continuity of supply regardless of climatic conditions or failures of the water supply system.

The drought response plan will contain the pre-determined response to droughts, including trigger levels for implementing and exiting water restrictions, water efficiency measures and construction of new climate resilient water supplies. The drought response plan will also include the introduction of purified recycled water to Wivenhoe Dam to supplement drinking water supplies. If Medium Level Restrictions and purified recycled water are introduced and the combined regional storage levels continue to decline, then the construction of projects identified in the drought response plan will be triggered. The trigger points for various aspects of the drought response plan are discussed in the following sections, together with the size and placement of the drought storage reserves.

Preparation for the construction of infrastructure in response to a drought will commence no later than when restrictions commence. However, it may be prudent to commence preparation for construction in advance of the commencement of restrictions, depending on the time of year, the rate of decline of regional storages and the level of preparedness of alternative options under the drought response plan.

The construction of drought response infrastructure is expected to occur not more than once every 100 years on average. Once constructed, this infrastructure will become part of the permanent water supply arrangements and would delay the need for future planned augmentations of the system.

While the drought response plan projects will be completed within a nominal period of 30 months, the water restrictions will only be lifted if:

- the drought conditions ease—that is, following one or more major rainfall events resulting in significant inflows,
  or
- the commencement of construction of additional pre-planned infrastructure that increases the volume of climate resilient or climate independent water supplies is brought forward.

The drought response plan will also contain contingency or emergency measures to manage extreme risk events, such as if one of the drought response projects is delayed or an extremely poor inflow sequence occurs. The measures will reflect the circumstances of the event, and may only be determined when Medium Level Restrictions have been introduced. One option is the introduction of a second tier of water restrictions—emergency restictions. Such restrictions would involve reducing average regional residential consumption to 140 litres per person per day. This is equivalent to approximately 25 per cent reduction from the planning assumption of a regional urban consumption of 375 litres per person per day under normal operating mode. For comparison, during the most critical water supply period of the Millennium Drought, residents in the restricted area of SEQ used an average of 129 litres per person per day. The likelihood that

emergency measures such as these would need to be implemented is sufficiently low that it is not considered appropriate to warrant their inclusion as an LOS objective, but rather to embed them in the drought response plan as emergency restrictions.

3.1.3 SEQ Water Grid operations

The Strategy partitions the water storage compartment in SEQ dams both individually and as a combined total SEQ system into:

- working volume
- drought storage reserve
- minimum security volume
- minimum operating volume (dead storage).

Figure 3.1 illustrates the partitioning of the water storage compartment of the region's dams. These partitions apply both to individual dams and across the SEQ Water Grid as a whole. Many individual dams are also constructed with a flood storage compartment that sits above the water storage compartment.

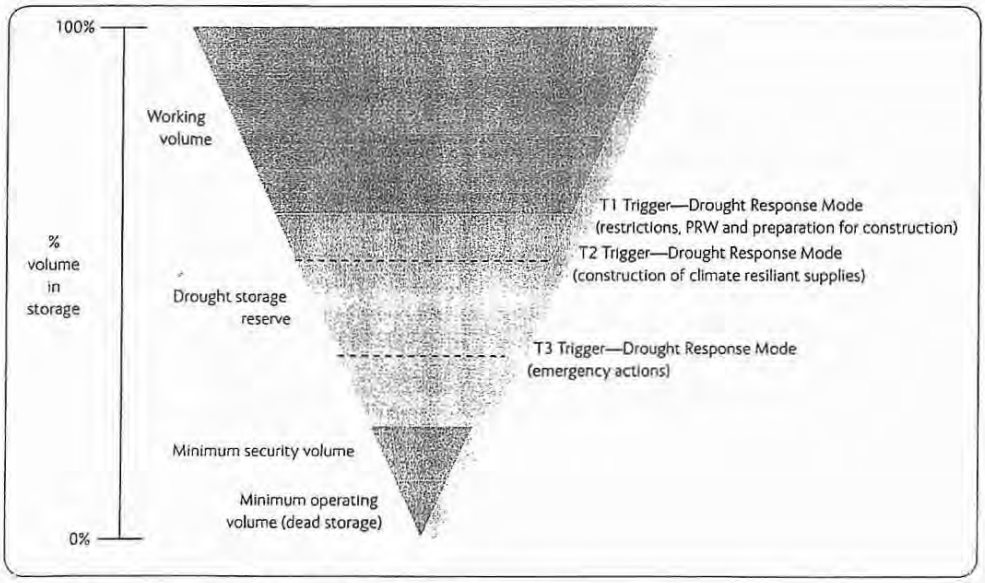


Figure 3.1 Partitioning of key SEQ Water Grid storages

The normal operating mode applies when the SEQ Water Grid is within the working volume. This mode will apply over most periods in the long term, consistent with the LOS objectives.

Below the working volume is the drought storage reserve. The combined SEQ Water Grid drought storage reserve underpins the drought response plan. The drought storage reserve is sized to provide, in conjunction with climate resilient sources, a minimum of 36 months' supply of water at a restricted demand. The actual volume of the drought storage reserve will vary over time according to the mix of supplies and the demand for water.

Calculation of the drought storage reserve requires consideration of:

- the restricted demand
- climate resilient dam inflows
- system losses, including evaporation and transport losses
- access to climate resilient and climate independent supplies, such as purified recycled water and desalination.

The drought storage reserve will only be held in the dams included in the definition of the key Water Grid storages.

Section 5 lists the region's surface water supplies. The following supplies are included in the definition of key SEQ Water Grid storages used to calculate the critical triggers—Baroon Pocket Dam, Ewen Maddock Dam, Cooloolabin Dam, Wappa Dam, Lake McDonald, Somerset Dam, Wivenhoe Dam, North Pine Dam, Lake Kurwongbah, Leslie Harrison Dam, Hinze Dam and Little Nerang Dam. This list includes all storages in SEQ owned by Seqwater, but excludes:

- weirs and off-stream storages that are too small to contain significant drought storage reserves
- storages that predominantly supply rural users, since these will not be required to be operated in accordance with the urban storage rules
- storages that supply a community that has no existing or committed SEQ Water Grid connection.

It is noted that drought storage reserves may still be specified for some of the predominately rural dams. For example, Moogerah Dam will include a volume to ensure security of supply for Boonah and connected towns. However, these reserves will be based on local considerations, rather than on the methodology outlined below.

At this time, the partitioning of individual dams defined as key Water Grid storages will be the same as the partitioning of the overall SEQ Water Grid. That is, the working volume of each dam will be between 40 per cent and 100 per cent of storage capacity. This partitioning may be reviewed over time, once the operation of the SEQ Water Grid has been refined.

The SEQ System Operating Plan describes the rules for operation of the SEQ Water Grid. These rules will influence the take from, and level of, specific dams. The rules establish acceptable levels of short to medium-term risk associated with triggering water restrictions and constructing new climate resilient water supplies. The LOS objectives also provide for the average expected performance of water supply over the long term. The rules balance short-term operational cost and efficiency benefits with maintenance of the long-term security objectives. This is achieved by understanding the real operational risks over shorter timeframes. Importantly, short-term financial gains should not be realised at the expense of long-term water security.

Within the combined SEQ Water Grid drought storage reserve there are three trigger levels:

- T1 is the trigger to enter the drought response mode (preparation phase). It applies when regional storage volumes drop down into the drought storage reserve. Pre-planned Medium Level Restrictions will be introduced and purified recycled water will be added to Wivenhoe Dam at this time. This phase provides time to prepare for construction, in the event of continued drought conditions.
- T2 is the trigger to enter the drought response mode (construction phase). It applies when construction of new climate resilient or climate independent water supplies, such as desalination plants, is required to commence to ensure that the restricted water demands for the community can be met for the duration of a long, severe drought.
- T3 is the trigger to enact emergency measures.

The trigger levels are stated in the SEQ System Operating Plan and will be reflected in the drought response plan.

For the SEQ Water Grid, the risk of drawing down to operationally significant storage levels, such as T1 or T2, will depend on the current storage volume within the system. Larger storage volumes, coupled with the increased opportunity for conjunctive system operation (transfers, desalination, or use of purified recycled water), result in a reasonably long period over which supply can be maintained with below-average inflows without drawing down to these trigger levels. However, operational decisions made when storage volumes are relatively high can still have a significant effect on regional water security (and potential infrastructure expenditure) if extended periods of low inflows are experienced.

Essentially, rules in the SEQ System Operating Plan enable timely modification of system operation to ensure that these risks are maintained within acceptable levels to the extent that is possible.

T1 has been set at 40 per cent of the combined capacity of the key Water Grid storages in SEQ. This aligns with advice to the Queensland Government from the QWC regarding the appropriate trigger to commence the introduction of purified recycled water in Wivenhoe Dam as an emergency source of supply.

T2 has been set at 30 per cent of the combined capacity of the key Water Grid storages in SEQ. This is determined by the need to allow a nominal 30 months for the construction of infrastructure in response to a drought, and by the LOS objective that the frequency of triggering drought response infrastructure will be not more than once every 100 years, on average. If the drought response plan identifies a critical project that requires more than 30 months to implement, then the time and associated trigger point for T2 will need to be reassessed. It is essential that both the T1 and T2 triggers are appropriate for the type and scale of response planned.

T3 will be set in the drought response plan. It is likely to vary depending on factors such as the period of time until drought response infrastructure is completed. It is expected to be set at 20 per cent or less of SEQ Water Grid storage capacity.

All the trigger levels may change over time, as new sources of supply are constructed and demand increases.

The minimum security volume is set at 5 per cent by the LOS objective that regional water storages must not be permitted to reach 5 per cent of combined storage capacity.

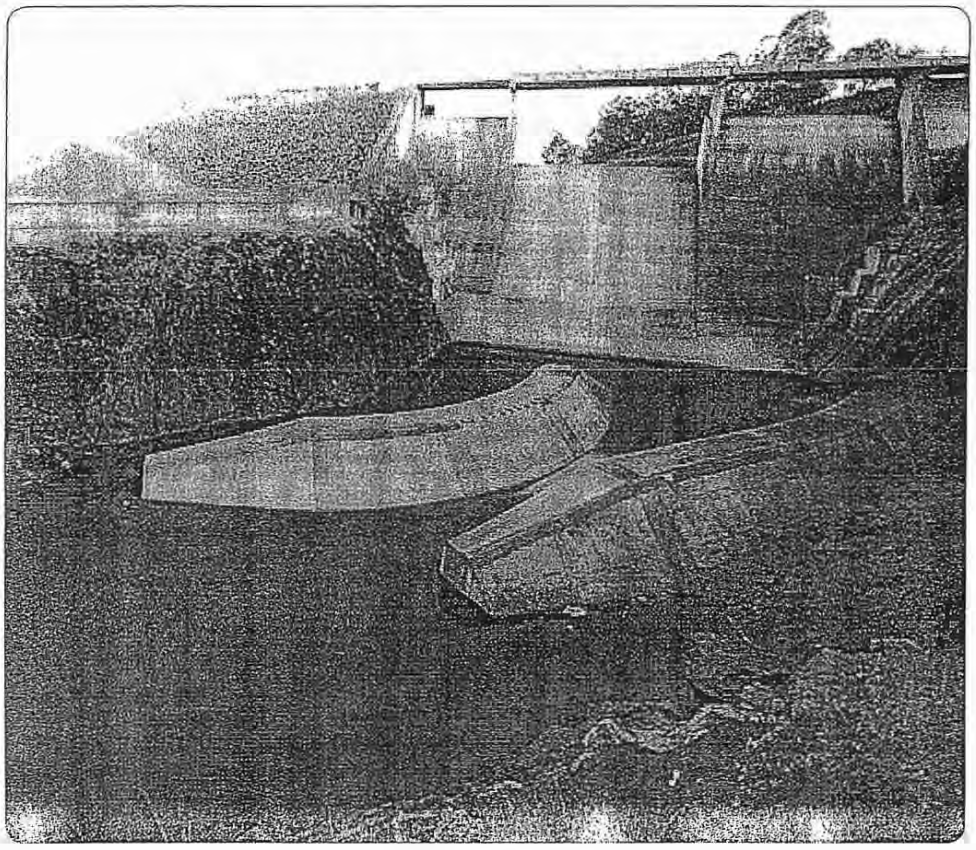
The minimum operating volume for any storage is included in the appropriate resource operations plan and may be referred to as the dead storage level. Water below the minimum operating level cannot be accessed with existing infrastructure.

3.1.4 Drought response exit

To exit the drought response mode, the combined SEQ Water Grid storage levels will need to increase beyond the T1 trigger level. The exit level will need to be set sufficiently above the drought storage reserve to minimise the risk of re-triggering water restrictions within an appropriate period. The actual exit level would be determined following consideration of:

- climate forecasts
- the existing mix of climate dependent and climate resilient supplies
- the status of any infrastructure projects in construction
- current policy on the use of purified recycled water
- short-term limitations on system capacity due to water quality
- managing the risk of use rebounding above consumption targets once the drought response mode is exited.

Ultimately, the capacity above T1 that is selected will need to strike a balance between the cost of staying in drought response mode unnecessarily, and the economic and social cost of moving out too early, and being forced to re-enter shortly after, if dam levels decline back to T1.



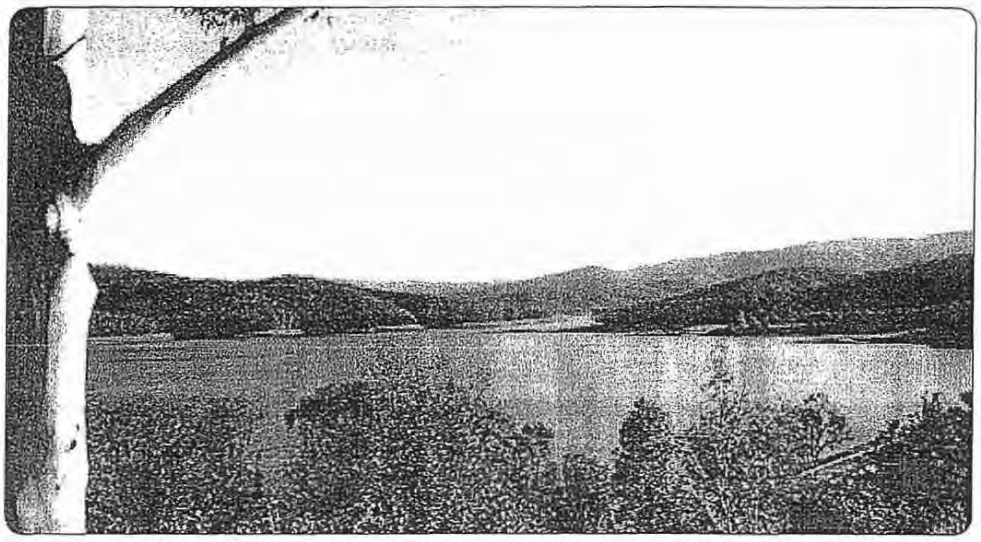
3.1.5 Determining the yield of the SEQ Water Grid

The LOS objectives are performance objectives for the delivery of bulk water supplies from the SEQ Water Grid.

The LOS system yield is the volume of water that can be supplied from the SEQ Water Grid every year and still achieve the LOS objectives. Until recently, estimating the system yield of a suite of integrated sources of supply has been based on an aggregation of yields of individual sources of supply, treated as unconnected. The modelling undertaken for this Strategy incorporates assessments of the LOS yield of specific dam systems and of the SEQ Water Grid as a whole. Future water availability has been estimated following consideration of:

- the LOS objectives
- environmental flow objectives and associated releases needed to maintain riverine, estuarine and marine ecosystem health
- water allocation security objectives
- resource operations plans
- total water storage capacity in the SEQ Water Grid
- inflows to the SEQ Water Grid storages over the period of the historical record
- estimated variability in inflows based on synthetically generated datasets that have the same statistical inflow characteristics as the historical record
- the possible impacts of climate change on inflows
- supply from climate resilient sources
- the volume of the regional drought storage reserve, and its distribution across individual dams.

Under the Strategy, less water is proposed to be used than is permitted under water resource plans and resource operations plans. This is because, in order to achieve the LOS objectives, water must be 'banked' in the wetter periods so that it is available during droughts that may be worse or more frequent than has occurred in the last 100 years. Fully using the available allocation could place the urban community at risk of supply failure during extended drought, especially from droughts worse than those that have been experienced since records were kept.



However, while the LOS system yield of the SEQ Water Grid is less than the sum of the allocations held by the SEQ Water Grid Manager for urban use, it is larger than the sum of the LOS yields of the individual systems.

Using less urban water than permitted under water allocations issued in compliance with water resource plans generally results in dam levels being higher than would otherwise be the case, because additional reserves are held in storage. In turn, this results in an increased likelihood of overflows from dams with associated environmental benefits and higher announced allocations for rural irrigation. The benefits for rural users of this arrangement are described further in Section 6.6.

For the purposes of water supply planning, modelling focused on the quantity of water. In practice, considerations such as water quality and other physical operational constraints will affect the performance of the SEQ Water Grid. However, these influences, though important in the short-term management of our water supplies, do not significantly impact on the overall LOS system yield of the SEQ Water Grid.

The regional water balance model has informed the development of broad operating rules for the SEQ Water Grid. These rules seek to balance the short-term operational costs and efficiency benefits of SEQ Water Grid operation with long-term water security objectives.

Operating rules for optimal use of the region's urban water supplies will be addressed in the SEQ System Operating Plan (refer to Chapters 5 and 7). Optimising the use of any surplus water supplies might include supplying rural production or transferring water to areas outside of the SEQ region or those areas not covered by the SEQ System Operating Plan. This could include supplying surplus water to the Tweed Shire in northern New South Wales, if appropriate.

3.1.6 Determining the climate resilient yield of the SEQ Water Grid

Some inflows will be received into the region's dams and weirs even in the most severe droughts. These inflows are referred to as climate resilient, as distinct from climate independent water supplies such as desalination. For example, during the most severe period of the Millennium Drought in 2006–2007 35 000 megalitres of inflows was recorded into the Wivenhoe–Somerset system, compared to an average of 615 000 megalitres per year in the preceding twenty years.

Assumptions about the level of climate resilient inflows influence the size of the drought storage reserve as well as the capacity of the climate resilient infrastructure that is constructed as part of the drought response plan. Assumptions must be based on a clear understanding of the risk of future drought inflow sequences occurring.

The 30-month construction period represents a critical component of the drought response plan. The trigger level for commencing construction depends on the assumed level of inflows over this 30-month period. If lower inflows occur during this period than were assumed in calculating the trigger level, then the volume of water in storage will be drawn down to critical levels before contingency infrastructure is completed. This could compromise regional water security. Planning for new infrastructure that might be required can shorten the construction time and is therefore an important part of drought response planning.

Stochastic modelling has been undertaken to determine the severity of potential droughts in SEQ. The modelling shows that SEQ should be prepared for droughts that are significantly worse than what was experienced during the Millennium Drought. However, the likelihood of these extreme events occurring is less than one in 10 000 years, on average.

The sequence used to calculate the climate resilient inflows was 30 months of inflows equivalent to a drought with a severity of between a one in 1000 and one in 10 000 year occurrence. The emergency plan provides a way of responding in the unlikely event that a drought is more severe than this.

3.1.7 Achieving the Level of Service objectives

The LOS objectives are performance objectives for the delivery of bulk water supplies from the SEQ Water Grid.

The statutory instrument for achieving the LOS objectives in SEQ is the SEQ System Operating Plan. The SEQ System Operating Plan specifies rules for how the SEQ Water Grid is operated to achieve the LOS objectives, within the bounds of the resource operations plans. The SEQ System Operating Plan directs how water can be supplied to meet the water needs of urban consumers and any other contracted customers in SEQ. This includes the supply of manufactured water sources, such as purified recycled water.

LOS objectives form part of the product definition for bulk water supplied in accordance with the SEQ System Operating Plan by the SEQ Water Grid Manager to any bulk transport node, ready for local distribution. Figure 3.2 illustrates where the LOS objectives apply under the SEQ institutional arrangements.

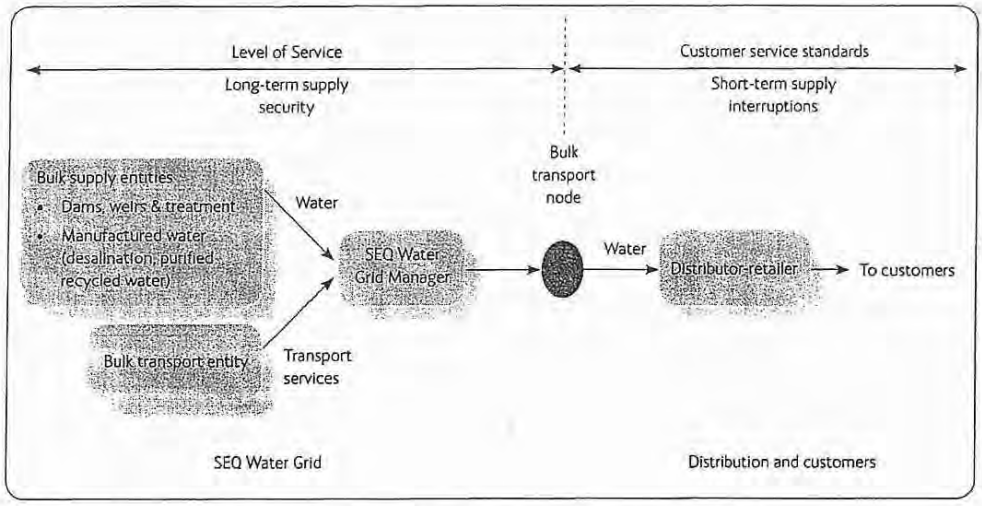


Figure 3.2 Application of LOS objectives and customer service standards

LOS objectives should not be confused with customer service standards. Customer service standards describe the level of service that a customer can reasonably expect from their distributor-retailer—for example, the response time to a breakdown or an interruption to supply. Each distributor-retailer will have the primary interface with customers, particularly through reading meters and issuing water and wastewater bills. Over the next three years, customers will move from local government area customer service standards under the *Water Supply (Safety and Reliability) Act 2008* to a Customer Water and Wastewater Code and regionally consistent service standards, and finally to guaranteed service standards. Customers will have input into the type of guaranteed service standards they want. A distributor-retailer will be required to compensate a customer if a guaranteed service standard is not met.

3.2 Planning for climate change

Climate models are used to forecast possible short- and longer-term climate change and likely impacts. They simulate oceanic and atmospheric processes and the important connections between land, oceans and the atmosphere. A factor affecting the usefulness of the climate models is the resolution, with most global climate models typically using a grid of between 150 and 300 kilometres.

There is considerable uncertainty about the accuracy of climate change projections and this uncertainty increases with the length of the projections made.

Regional climate models have been developed that increase the resolution of global climate models. This process is called 'downscaling' and requires enormous computing power. These models have reduced the uncertainty associated with the low resolution of global climate models. Work is underway to improve climate change estimates in terms of impact on stream flows. As already indicated in Section 2.4.2, case studies indicate that by 2031 the annual stream flow for the Brisbane River downstream of Mt Crosby Weir could be reduced in a dry scenario by up to 28 per cent or increased by up to 14 per cent in a wet scenario. Such impacts are expected to be highly variable across the whole of SEQ. Climate research indicates that, as a conservative estimate, a 10 per cent reduction in surface water availability is likely to occur by 2030.

The majority of climate modelling results for SEQ catchments indicate that the region is likely to become drier, with increases in average temperature and evaporation rates. This suggests that climate change may dramatically impact on regional water supplies. Consequently, less surface water is likely to be available for water catchments and dams. These changes are expected to occur over the medium to long term. This contrasts with Perth, where there is evidence that a change in inflows has already occurred.

More analysis is necessary to improve our understanding of climate change impacts. Such work is being progressed by the Queensland Government Climate Change Centre of Excellence and the CSIRO, through the SEQ Urban Water Security Research Alliance. Over time, this work will downscale the CSIRO global model simulations, and simulations from six other international modelling groups, to a 14 to 20 kilometre resolution for SEQ. It will result in a better integration between the climate change models and hydrologic modelling.

In Chapter 6, a scenario analysis has been undertaken assuming a 10 per cent reduction in the LOS yield of surface storages due to climate change. If there was an immediate climate change impact, the earliest date for supply augmentation could move forward from 2022 to 2017 (refer to Section 6.4.2). However, this impact is likely to occur over decades and the true impacts of climate change are currently difficult to quantify.

The scenarios adopted in the Strategy will be reviewed annually and revised as our understanding of the likely impacts of climate change in SEQ water supplies becomes better informed.

3.3 Planning for rural production

The Strategy includes significant initiatives to improve supply to the rural sector, as discussed in Chapter 6.

Rural water entitlements are defined through the water resource planning processes. In supplemented schemes, rural water allocations are generally specified as medium priority water, with a reliability of supply less than high priority (urban or industrial) water. This approach enables larger volumes of water to be made available during periods when dam levels are high. A significant portion of rural water entitlement exists from unsupplemented supplies—that is, water not supplemented by releases from dams or weirs.

In SEQ, water supply schemes exist in the Mary, Logan, mid-Brisbane, Lockyer and Warrill valleys. These supplemented schemes have historically operated with varying degrees of performance success and irrigators have sought ways to further enhance water security. Irrigators currently do not pay for the full cost of running these schemes. Chapter 6 discusses options to improve the reliability of supply within these schemes.

Additional water for rural use has also been made available due to the construction of the SEQ Water Grid, especially the Western Corridor Recycled Water Scheme. This additional water will be supplied to Category B (refer to Section 5.3.1) customers as an interruptible source. It will be available when the SEQ Water Grid is in normal operating mode, and is intended to cease when a drought response plan is implemented. Chapter 6 contains further information about these opportunities.

3.4 Profiling future demand

The Strategy is based on a comprehensive assessment of current and forecast water demands across SEQ. The methodologies and modelling will continue to be refined to actively monitor demand assumptions.

For this version of the Strategy, forecasting of urban water demands in SEQ has been based on:

- medium series population growth projections derived from the Queensland Government population projections—high series population forecasts have been used for sensitivity testing
- assessment of historical patterns of water use
- assessment of the historical effectiveness of existing and potential water-saving programs, including analysis of the costs and benefits of different water conservation and source substitution options at the end-user level
- aggregation of the forecast demands in each local government area to produce demand trend forecasts based on the continuation of existing policy in 2006—that is, assuming that water use continues into the future without savings from any additional demand management initiatives other than those that were already in place
- aggregation of the forecast demands in each local government area based on high, medium and low savings scenarios. The savings scenarios differ in terms of number and scope of demand management measures.

Population forecasts were revised in 2008, following the release of the first draft Strategy. The population forecasts contained in this Strategy have been adjusted based on these forecasts.

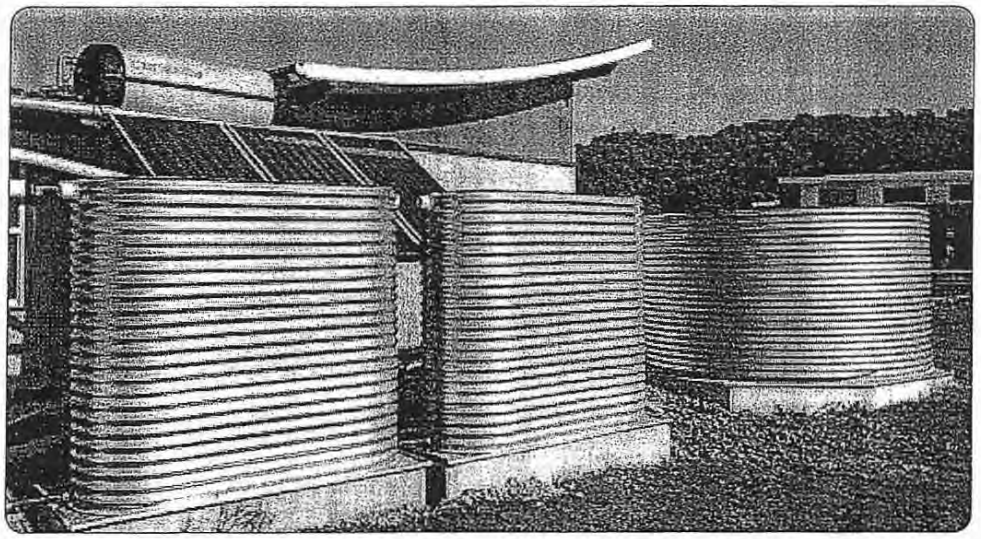
The potential reduction in demand from savings measures was estimated based on a range of complex considerations and assumptions. These included:

- structural water-saving measures implemented during the Millennium Drought
- the effectiveness of potential demand management measures, including participation rates and the number of water-efficient devices installed
- changing demographic patterns—in particular, the trend towards smaller households
- ongoing compliance with rules and regulations.

Demand forecasts are outlined in Chapter 4. Growth in demand for water for rural production is addressed in Chapter 6. To ensure that demand assumptions underpinning the Strategy remain current, ongoing demand monitoring and management will be undertaken using a water accounting framework, known as the Waterhub.

Increasing supply or reducing demand?

Some components of the supply and demand balance could be considered as either increasing supplies or reducing demand. The Strategy defines any new water source that contributes to the SEQ Water Grid as an increase in supply. For example, purified recycled water is considered to increase potable supply as it is added to the SEQ Water Grid. Water from rainwater tanks and other types of recycled water reduces demand on drinking water supplies from the SEQ Water Grid.



3.5 Process to select future supplies

The QWC proposes the use of an objective and transparent process to develop its advice to the Minister about the need for regionally significant augmentations of the SEQ Water Grid. This process is intended to:

- ensure the timely delivery of capital expenditure
- promote total water cycle planning
- provide an opportunity for parties other than the QWC to nominate innovative solutions for consideration
- ensure that options are compared on an objective, transparent and like basis, regardless of scale or type
- ensure that market participants receive information in a structured and equitable manner.

The process will consider demand and supply options, and options at a number of different scales. It will build on the detailed investigations outlined in Chapter 7, while also providing opportunities for the community and stakeholders to have input. The process may also provide opportunities for third parties to propose alternative solutions for assessment.

The key elements of the process will be:

- review of the Strategy
- a Statement of Needs
- a project selection process
- advice to the Minister on regional water security options.

The proposed process is illustrated in Figure 3.3.

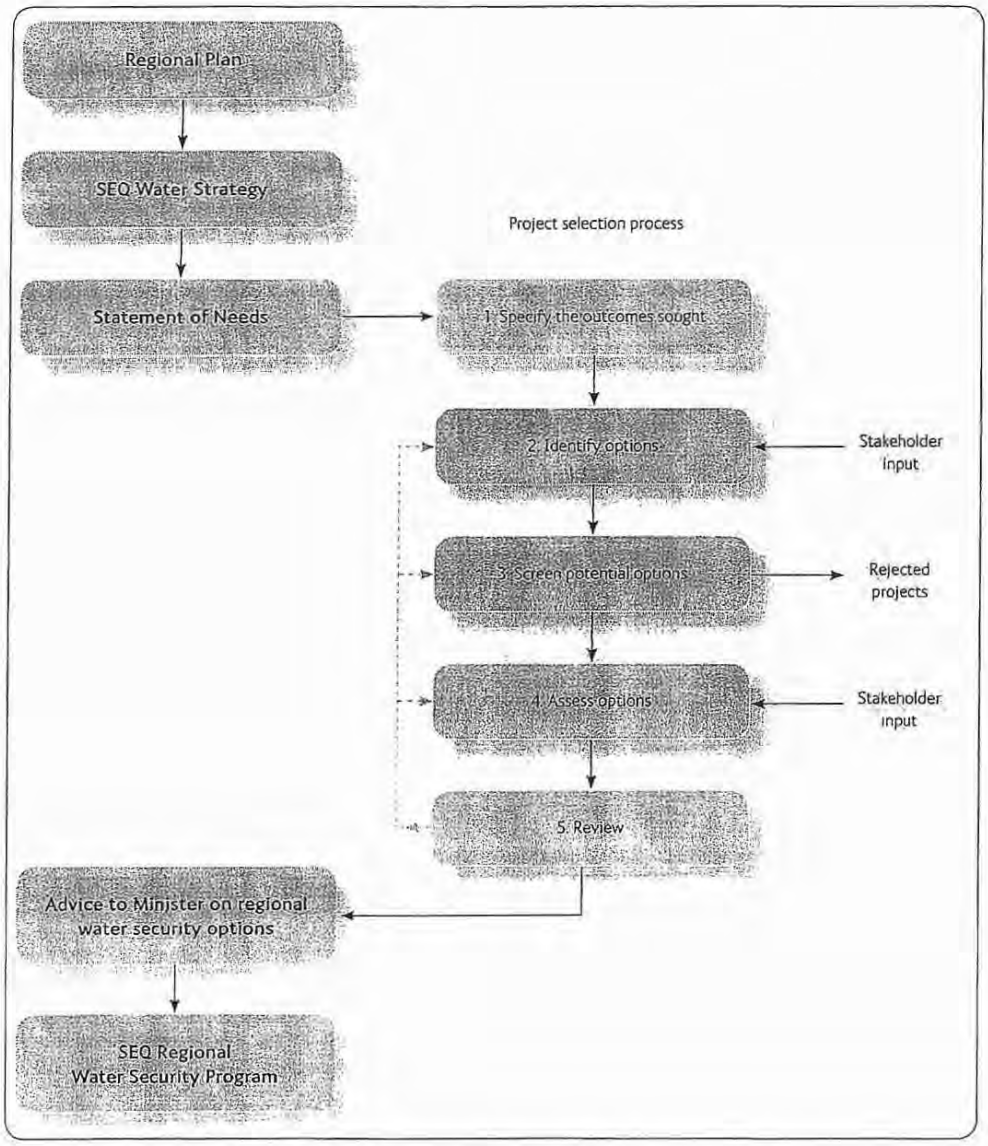


Figure 3.3 Statement of Needs and proposed project selection process

This process applies to development of new regionally significant projects only. Regionally significant projects generally involve expansion of the capability of the SEQ Water Grid to ensure that the LOS objectives can be achieved throughout the region, while operating in accordance with all relevant legislation.

Water service providers will undertake a range of other projects that are planned and regulated through separate processes. This includes projects such as renewal of existing infrastructure, the construction of new infrastructure for local needs, or improvements to the efficiency of service delivery. In some locations, planning for this infrastructure may be informed by a total water cycle plan, as explained in Section 2.3.

3.5.1 Review of the Strategy

The QWC will coordinate the review of the Strategy at appropriate times. The Strategy will be reviewed on a five-year cycle aligned with the review of the Regional Plan. Demand will be monitored as part of the assessment of the water balance, which will be reported on annually (refer to Section 7.1.2), and could result in a review of the Strategy being undertaken earlier.

3.5.2 Statement of Needs

Following the Strategy review, the QWC will prepare and publish a Statement of Needs that will clearly describe strategic requirements over the short to medium term. The Statement of Needs may identify the following types of regionally significant needs:

- an improvement to water quality within the region, such as feed water or treated water quality
- an augmentation of the water supply system, including broad identification of the scale and location of the augmentation
  or
- an improvement to system performance, such as the coverage of the SEQ Water Grid or the degree of interconnectedness.

The Statement of Needs may also include reference to institutional arrangements required to facilitate regional water security.

The Statement of Needs will be developed on the basis of the Strategy, including the water balance models that underpin it, and input from the SEQ Water Grid Manager and the water entities.

The QWC will seek endorsement of the Statement of Needs by the Queensland Government, to ensure it is aligned with current policies and strategies for SEQ.

3.5.3 Project selection process

In undertaking the project selection process (shown in Figure 3.3), the QWC will seek input to the process from professionals with appropriate expertise, as well as from a stakeholder reference group. This group will be established from key community and government stakeholders in SEQ who are likely to have an interest in the outcomes sought.

The assessment of projects will be based on the incremental benefits they could provide for the SEQ Water Grid as a whole. For example, an assessment could consider the benefits of increasing the operating level of Wivenhoe Dam in terms of the yield of the SEQ Water Grid as a whole, rather than the yield of the dam operating on a stand-alone basis.

3.5.4 Advice on regional water security options

The QWC is required to provide advice to the Minister on regional water security options. The advice must address the following issues:

- the desired LOS objectives
- demand management for the region
- water supply or sewerage works for achieving the desired Level of Service objectives
- an assessment of the likely costs and pricing implications of the works
- the preferred ways of sharing the cost of the works.

After completing the options selection process, the QWC will provide advice to the Minister on the outcomes sought, options considered and the recommended projects to be adopted in the Regional Water Security Program.

3.6 Potential portfolio

For this Strategy, a long-term water balance was constructed for the entire SEQ region and for the northern, central and southern sub-regions. This water balance was prepared on the basis of:

- projected regional demands
- the LOS objectives described earlier in Section 3.1.1
- purified recycled water being used to supplement supplies in Wivenhoe Dam when SEQ Water Grid storage levels fall to 40 per cent of capacity.

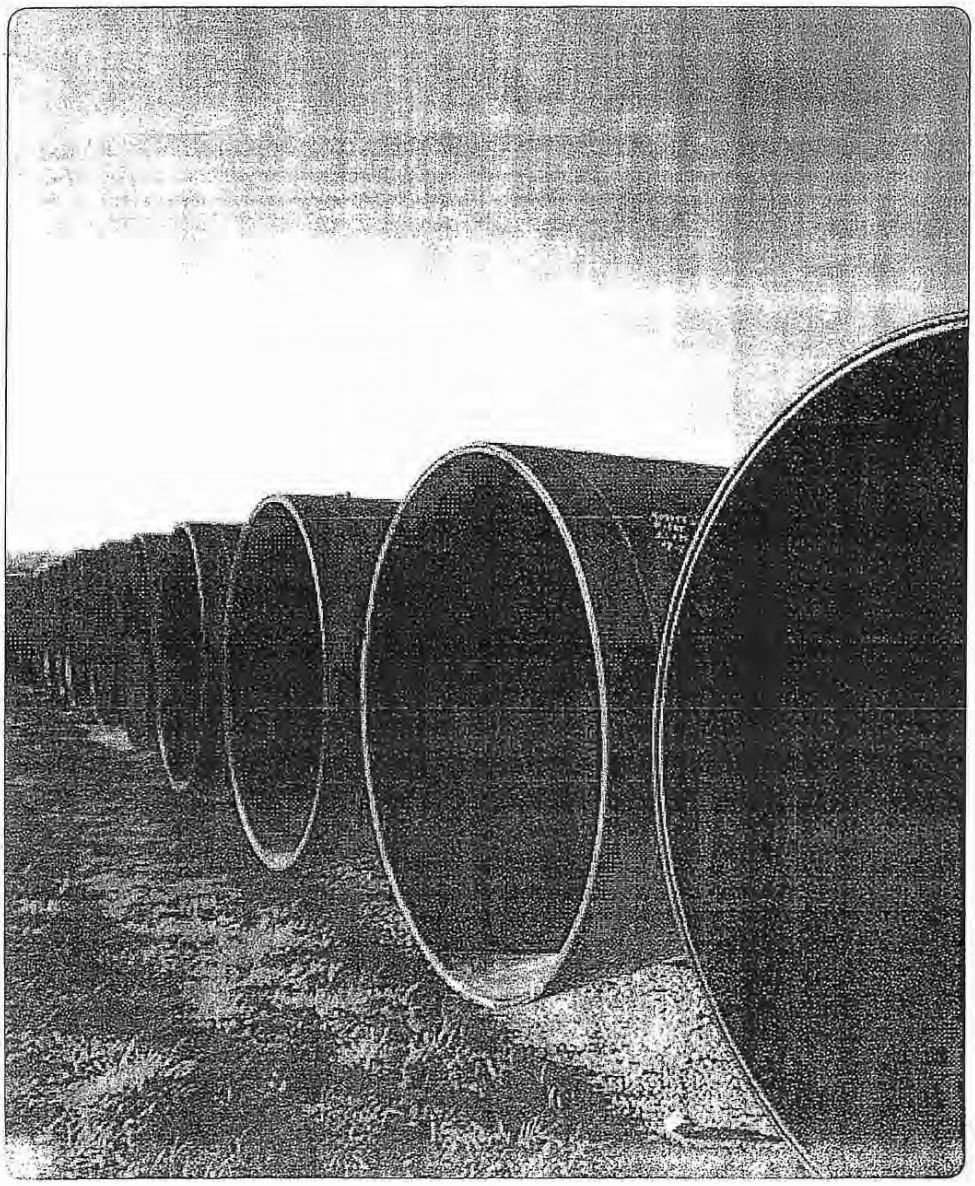
The water balance was used to identify approximately when and where supply gaps would occur in the future on a whole-of-grid basis. This preliminary assessment was conducted for the case of medium series growth, with ongoing demand management embedded. Further work will be required considering sub-regional and local needs when the Statement of Needs is produced.

Current and potential water supply sources are described in Chapter 5. As noted above, these projects will provide the base case supply solutions against which any alternatives can be assessed following the Statement of Needs process.

Chapter 6 includes a number of potential portfolios based on these projects. These portfolios demonstrate that the potential sources are sufficient to ensure a secure water supply for SEQ to 2056 and to indicate the potential portfolio of future supplies based on currently identified sources and technologies. The portfolios do not pre-empt or pre-judge the outcomes of the selection process outlined above.

A potential base case portfolio was identified to be the medium series base case portfolio for the region. Building on this, a second portfolio was identified that could be used to fill the supply gap if high series demands emerge. A range of sensitivity analyses were conducted to understand the impact of key assumptions on the possible timing and scale of infrastructure that might constitute the future portfolio of projects.

The base case portfolio will be used to assist in the development of the region's drought response plan and as a standard for comparing future water supply options on either a bulk or local scale within the region. The base case portfolio will be reviewed and updated over time, utilising the assessment methodology as required.



Chapter 4

SEQ's future water demand

This chapter discusses water consumption trends as well as initiatives and projects being implemented to reduce water demand and increase efficiency of use. It also describes demand management strategies to support the LOS objectives for water supplies during normal times.

Key messages

- All sectors of the community should use water efficiently.
- A wide range of demand management programs have been implemented.
- The Strategy is based on maintaining demand for SEQ Water Grid water at least 24 per cent below pre-drought trends. By 2056, this will save about 241 000 megalitres per year based on medium series population growth.
- A conservative planning assumption of a maximum average regional urban consumption of 375 litres per person per day of SEQ Water Grid water underpins the Strategy. In 2004–05, average consumption was about 450 litres per person per day.
- Planning assumptions will be reviewed on a regular basis.
- Large non-residential water users, including business and industry, will be required to continue to keep moving towards best practice water efficiency.
- Businesses with reasonable access to the Western Corridor Recycled Water Scheme will be encouraged to use recycled water.
- Power stations will be required to use recycled water rather than other supplies when using water from the SEQ Water Grid.
- All building development applications lodged for the construction of new homes in SEQ must meet mandatory water savings targets. Internally plumbed rainwater tanks are one option to achieve the water savings target.
- Rainwater tanks and stormwater harvesting in new developments are forecast to reduce demand on bulk water supplies by about 7 per cent by 2056.

The demand management program that will support the achievement of the LOS objectives for water supply in normal operating mode is described in Section 6.1.

Water demand information

Water accounting data for the Strategy has been collected at a billing level from the 10 local government authorities listed in Section 1.1. Demand analyses were conducted on a local and regional basis, historically and out to 2056. Demand has been forecast for the residential, commercial and industrial sectors, and system losses. Forecasts have been prepared with and without demand initiatives and climate change impacts being applied.

4.1 Pre-drought water consumption

Prior to the Millennium Drought, there were very few drivers for urban and industrial users to reduce consumption. During periods of poor inflows, Wivenhoe Dam had previously contained sufficient storage reserves to maintain unrestricted supplies across most of the region. There have always been limitations on supply for rural water users, which have resulted in some inherent self-regulation of use.

Unrestricted consumption provides a starting point for water planning. In SEQ, the most recent unrestricted consumption occurred prior to May 2005. Table 4.1 summarises water use patterns in 2005.

Table 4.1 SEQ water consumption in 2005

Sector	Water consumption (megalitres per year)	Proportion urban demand (per cent)	Total demand (per cent)
Urban	277 459	65	
Residential	91 426	21	
Non-residential	59 808	14	
Total urban	**428 693**	**100**	69
Power generation	38 000[1]		6
Rural communities	5 703[1]		1
Rural production	150 000		24
Total	**622 396[2]**		**100**

[1] Historical information that includes estimated consumption for Rosalie, Jondaryan, Crow's Nest and Cooloola.

[2] Excludes recycled water supplied to industry, golf courses and parks.

About 75 per cent of water consumed in SEQ in 2005 was used for urban purposes and power generation. The remainder was used for rural purposes. This pattern differs from the overall Australian consumption pattern. In 2000, Australia used 83 per cent of its water for rural applications and only 17 per cent for urban and industrial applications.

System losses accounted for about 14 per cent of the water used for urban purposes, including fire services, metering errors, leakage and theft (refer to Section 4.3).

Average total urban consumption in SEQ varied between local government areas, from 300 to 500 litres per person per day with an average of 450 litres per person per day. On average, residents of SEQ with reticulated drinking water supplies consumed approximately 300 litres per person per day. As shown in Table 4.2, this rate of consumption was comparable with that in other capital cities in Australia.

Table 4.2 Average residential water consumption in Australian cities (2004–05 to 2008–09)

City	2004–05 (litres per person per day)	2008–09 (litres per person per day)
SEQ[1]	282[1]	143[1]
Sydney	215	202[2]
Canberra	255	195[2]
Melbourne	195	157[2]
Adelaide	265	228[2]

[1] Average residential consumption in all local government areas in SEQ.

[2] Estimates calculated from National Water Commission and Water Services of Australia (2010) *National Performance Report 2008–2009*, and Australian Bureau of Statistics information. Consumption in some cities was affected by water restrictions.

4.2 How the Millennium Drought changed our thinking

From 2005, as the extent and impacts of the Millennium Drought became evident, the Queensland Government introduced a range of demand management measures. Many of these measures have been made permanent.

Following implementation of these measures, there was a significant improvement in water efficiency coupled with a substantial reduction in demand. In the central SEQ and Gold Coast region, average urban consumption dropped from 450 litres per person per day in 2005 to approximately 230 litres per person per day from mid-2007 to mid-2009 (refer Figure 4.1). It has remained below 260 litres per person per day since mid-2009, despite the easing of restrictions.

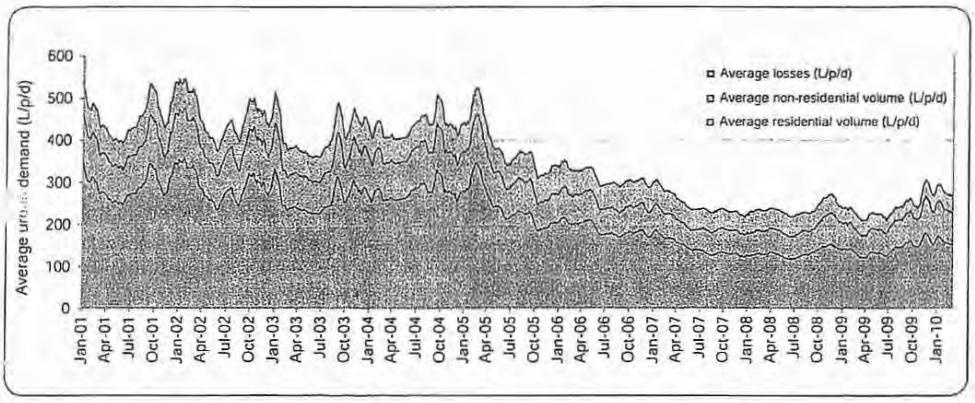


Figure 4.1 Average total per person consumption since 2001 in central SEQ and Gold Coast

Residents achieved most of the savings. Average residential use in those regions of SEQ that were under QWC restrictions was 131 litres per person per day from mid-2007 to mid-2009 (refer to Figure 4.2). In mid-2010, with Permanent Water Conservation Measures and Target 200 in place, residential consumption in the same region continues to be low, averaging around 165 litres per person per day. This indicates that the water-efficient habits developed by residents during the height of the drought are being maintained.

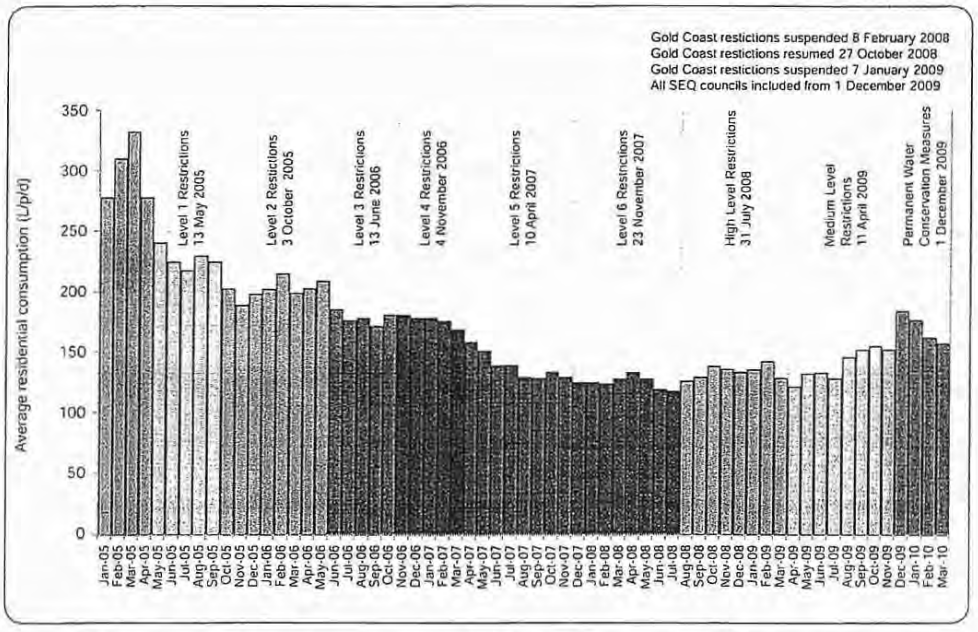


Figure 4.2 Average residential consumption for SEQ regions under QWC restrictions since 2005

Residents in other parts of SEQ have also reduced consumption, but not to the same level as central SEQ. For instance, residents on the Sunshine Coast reduced average consumption from about 317 litres per person per day in 2004–05 to about 224 litres per person per day over the six months to the end of May 2010. Gold Coast residents used an average of 206 litres per person per day over the same period. While these residents were not subject to QWC water restrictions until 1 December 2009, these areas had access to the same rebate and retrofit schemes as central SEQ.

Non-residential water use has also decreased. In 2009, 32 per cent less water was used by the non-residential sector than in 2004–05, saving 76.6 megalitres per day. These savings have been achieved despite the total number of businesses increasing by 16.9 per cent. Figure 4.3 illustrates the savings achieved by sector for moderate and major water users. Aside from irrigation, which was curtailed through temporary banning of outdoor watering, the most dramatic reductions were achieved by the public sector, followed by the commercial and other industrial sectors.

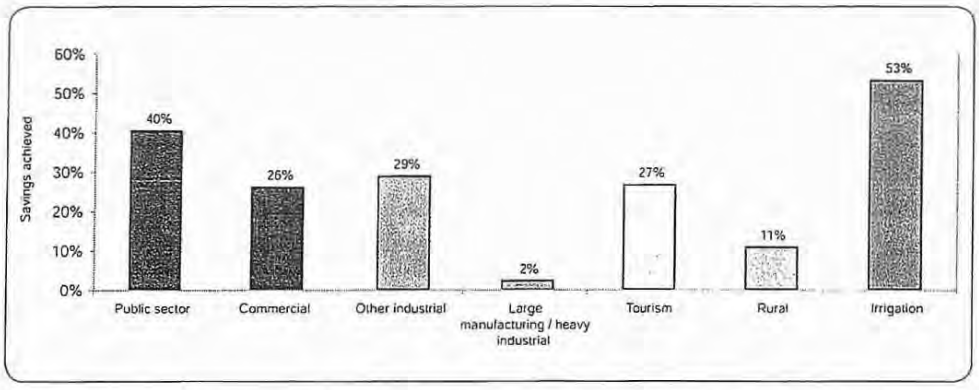


Figure 4.3 Savings achieved by non-residential sectors (2004–05 to the end of 2009)

4.3 Planning assumptions

The LOS objectives for normal operating mode include that sufficient SEQ Water Grid water be available to meet a regional average urban demand of 375 litres per person per day (including residential, non-residential and system losses).

The LOS objectives are the planning assumptions that are the basis for regional water supply planning, including detailed design of pipeline networks and water treatment plants. The assumptions are conservative, ensuring that new infrastructure can be constructed in sufficient time.

More detailed planning assumptions for residents, business and industry and system losses are specified in the remainder of this section. Chapter 6 outlines the demand management program that will contribute to the achievement of these assumptions, including the voluntary residential consumption target.

Residential planning assumption

Residential consumption is the largest sector of urban water use in SEQ (refer to Section 4.1). The community response to the Millennium Drought demonstrates the significant influence that this sector has on water security in SEQ.

The planning assumption of regional urban consumption of an average of 375 litres per person per day includes an allowance of up to 230 litres per person per day for residential use. This level of water use is considered to be comfortably sufficient to maintain the outdoor amenity and lifestyle that characterises SEQ.

This is a conservative assumption, and a prudent approach for water supply planning, taking into account the timeframes for delivering bulk water supply infrastructure and the level of uncertainty regarding:

- the extent of permanent behavioural changes by the community
- population growth
- climate variability
- the potential impacts of climate change.

However, the Strategy challenges residents to use less, voluntarily maintaining a regional average residential consumption below 200 litres per person per day. By maintaining consumption below this level, the need for new supplies could be deferred by at least five years. This challenge is described in Section 6.2.

Non-residential planning assumption

The planning assumption for non-residential water use is a regional average of 145 litres of water per person per day from the SEQ Water Grid.

Business, industry, government and other large users of water need to conserve water by being more efficient water users. The QWC has implemented Permanent Water Conservation Measures, which require these users to use water efficiently while minimising the risks to economic production and employment. The measures focus on businesses using more than 1 megalitre per year, and particularly those using more than 10 megalitres per year. The businesses in these categories comprise almost 90 per cent of existing non-residential water consumption in SEQ.

Through these permanent measures, business and industry will continue to move towards best practice water efficiency. Given this embedded best practice approach, it is expected that if there is another drought that requires the introduction of water restrictions, there will be minimal impact on water use associated with business activities.

Power generation planning assumption

Power stations are required to use recycled water when available, if accessing water from the SEQ Water Grid.

Consistent with this assumption, the SEQ System Operating Plan directs that purified recycled water from the Western Corridor Recycled Water Scheme must be the primary source of supply for any water being taken from the SEQ Water Grid to the Swanbank, Tarong and Tarong North power stations. The SEQ System Operating Plan is discussed in Section 7.2.1.

System losses planning assumption

System losses include losses from authorised uses such as fire fighting and maintenance, as well as unauthorised uses such as theft and leakage. System losses comprised 14 per cent of urban demand in 2005.

Bulk transport and network distribution system loss targets have been set at no more than 8 per cent of total urban water use. This target will be achieved through universal metering, better understanding and management of the operation of the system as a consequence of the pressure and leakage reduction project, and the design and management of new distribution infrastructure.

4.3.1 Basis for the residential planning assumption

The planning assumption of an urban consumption of a regional average of 375 litres per person per day includes a conservative allowance of 230 litres per person per day for residential consumption. The basis for this allowance is explained below. These considerations have also informed the level of the voluntary regional residential consumption target (refer to Section 6.2).

The residential planning assumption will be reviewed as part of the review of the Strategy, which will be at least every five years in line with the Regional Plan. It will also be reviewed at any point in the intervening period if it becomes clear that demand remains low, or is significantly increasing. This review of the planning assumption might be undertaken as part of preparing the annual report on the implementation of the Strategy (refer to Section 7.1.2).

Scenario assessment

The Strategy has been informed by a detailed assessment of future water demand (refer to Section 3.4). The assessment forecast the impact of individual measures upon 2004–05 trends, taking into account a range of factors including interactions between measures. For instance, shorter average shower times reduce projected savings from water-efficient showerheads.

A high savings scenario was derived, based on:

- education programs
- pricing and tariff design
- retrofit and rebate programs
- building audit programs
- irrigation management and controls
- sub-metering programs
- building code amendments
- pressure and leakage management
- dual-reticulation recycled water schemes in major new residential and industrial developments.

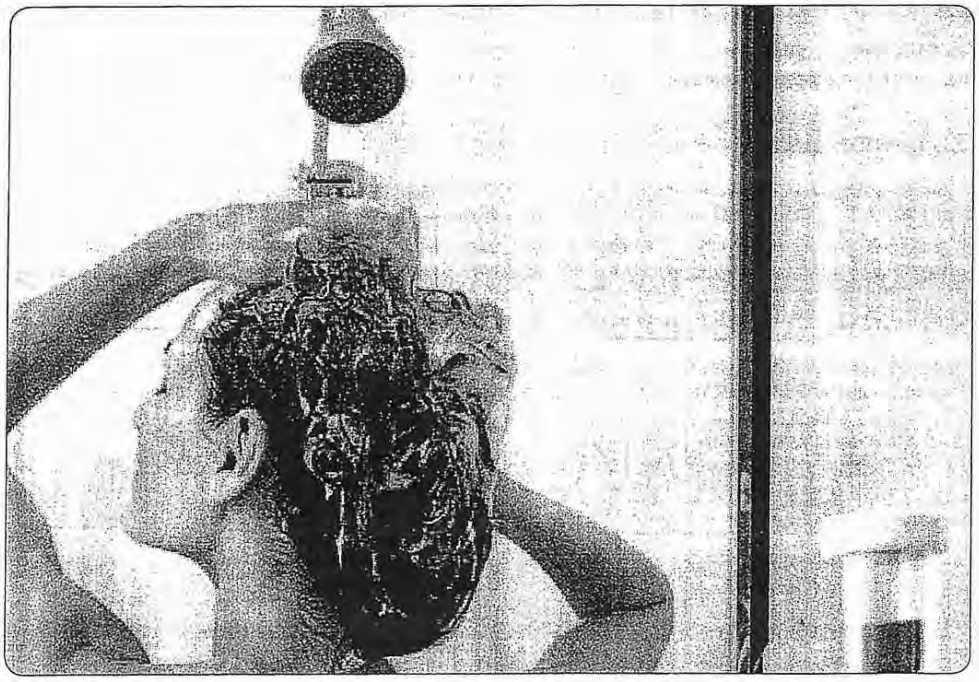
The high savings scenario forecast that average regional residential consumption would reduce by about 25 per cent, from 300 litres per person per day to slightly below 230 litres per person per day. The structural measures that have been implemented as part of the drought response were forecast to result in an immediate saving of 13 per cent, increasing to a saving of more than 20 per cent over time. The remainder of the savings was due to assumptions made about sustained behavioural changes. Greater savings may be able to be achieved with more sustained long-term behavioural changes (refer to Section 6.2).

Drought rebound assessment

There are limited precedents against which to assess how much of the behavioural changes made during the Millennium Drought will be sustained in the future. Until the late 1990s, water supply authorities in Australia did not generally seek to maintain savings that had been achieved during drought.

The information available for recent droughts in Australia and overseas indicates that the rebound back to this level of consumption can be expected to occur gradually over a minimum of two years with maximum savings of 10 to 15 per cent. The period of time over which the rebound occurs depends on a range of factors, including the amount of rainfall in following years and the extent of communications to the public to maintain water efficiency.

The extent and duration of demand reduction in SEQ exceeds that experienced in other major cities during severe drought. On this basis, the demand forecasts contained in Section 4.5 and Chapter 6 are based on consumption increasing gradually from actual levels at the end of 2009 to equal the planning assumptions by 2018.



Rebound from the Gold Coast drought

The Gold Coast experienced a severe drought during the period between June 2002 and January 2004. Water restrictions included total outdoor watering bans, with a high level of public awareness of these bans. Average regional urban consumption reduced from 440 litres per person per day to 360 litres per person per day at the height of the restrictions. In the 18 months after restrictions were lifted, regional urban demand increased to 400 litres per person per day and continued to rise. Restrictions were then imposed and demand reduced again. The effect of the 18 months of severe drought and restrictions was equivalent to an ongoing saving of less than 10 per cent.

This rebound occurred despite Gold Coast Water introducing an active demand management program that continued after restrictions were eased. Household retrofits, pressure and leakage management and volumetric pricing were all implemented after the restrictions eased.

The same drought affected northern New South Wales, where restrictions were in place in for more than 12 months and reached Level 7. During the drought, average total consumption reduced from 440 litres per person per day to as low as 300 litres per person per day. Average total demand remained at about 370 litres per person per day after the drought, a reduction of 16 per cent over the long-term average. Changes to water prices may also have contributed towards the saving.

Building block assessment

A building block approach was used to test the average lifestyle impacts of the proposed combination of measures across SEQ.

The Millennium Drought has shown that SEQ residents can reduce average residential consumption to below 140 litres per person per day compared to about 300 litres per person per day in 2005. However, for some members of the community, this may be unacceptable or unachievable over the longer term.

The allowance in the planning assumption of an average regional residential use of 230 litres per person per day represents an increase of 90 litres per person per day over the drought consumption levels. This represents around two hours of outdoor water use per household per week, if indoor use remained at approximately the same level as achieved under Target 140. In practice, some rebound in internal water use is likely to occur and some water will be used for other external uses, including topping up pools and washing cars.

By comparison, prior to the Millennium Drought, residents of SEQ used on average more than 120 litres per person per day for outdoor irrigation.

The reductions in outdoor water use are being achieved through a combination of structural and operational measures, as well as by sustained behavioural change (refer to Section 6.1).

High water users

A small proportion of households using a large volume of water have a major impact on average consumption. Since 2005, in the central SEQ and Gold Coast region, there has been a major reduction in the number of households using more than 800 litres per day and a significant increase in the number of households using between 300 and 600 litres per day. Prior to 2005, about 4.6 per cent of households in central SEQ used more than 2000 litres per day and about 36 per cent used more than 800 litres per day. In comparison, over the last three months of 2009, only 0.6 per cent of households used more than 2000 litres per day and 10.5 per cent used more than 800 litres per day (refer to Figure 4.4).

These savings have underpinned the significant reduction in average residential consumption in these areas. However, a significant rebound in the number of high water using households would have a major impact on average residential consumption across SEQ.

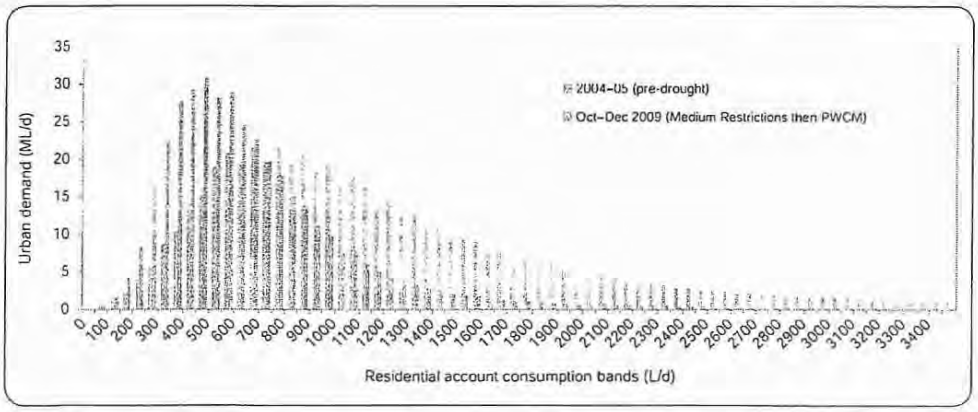


Figure 4.4 Residential consumption by consumption band for the central SEQ and Gold Coast region

Regional and household variation

The residential planning assumption and Target 200 are regional averages. Actual consumption varies considerably between households and across SEQ due to the type and age of a home, the number of occupants, the location of the home (in terms of climate and soil type conditions), and many other factors. In particular, it is forecast that:

- residents of new dwellings will use less water than residents of existing dwellings, due to water-efficient devices, rainwater tanks or other water supply alternatives. On average, residents of new dwellings are expected to use about 150 litres per person per day

- residents of units will generally use less water than residents of detached dwellings with gardens. The size and type of a garden, as well as access to tank water will influence the additional water requirements for such detached houses
- households with more people will continue to use less water per person than smaller households. For example, on average, a two-person household may use 200 litres per person per day (a total of 400 litres per day) while a six-person household may use 140 litres per person per day (a total of 840 litres per day)
- differences in rainfall will result in daily variations in external water use between locations, seasons and years, as illustrated in Figure 4.5.

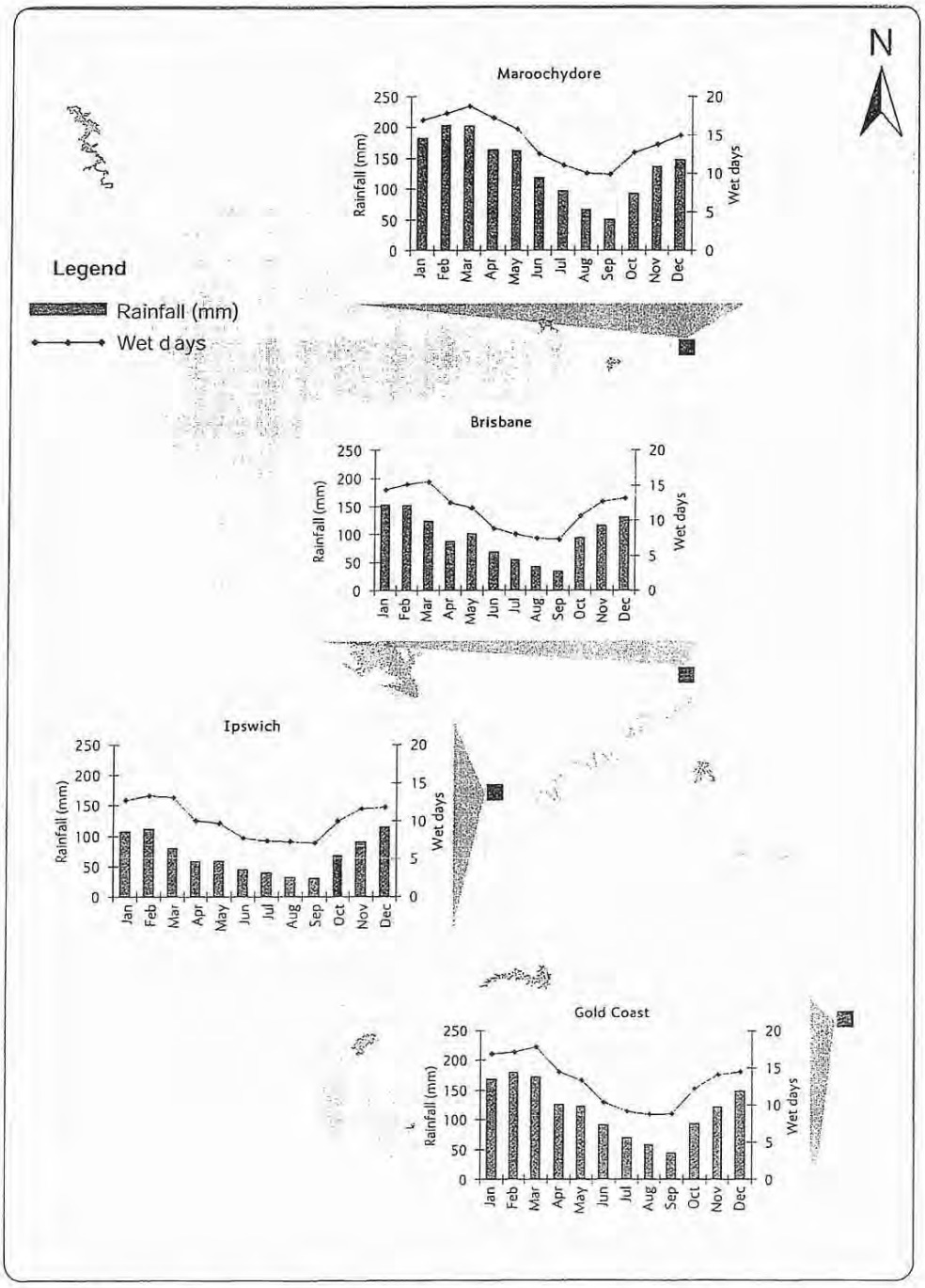


Figure 4.5 Regional variation in rainfall and rainfall days (data from 1957 to 2008)

External water use

Water is used outside the home for watering gardens, filling pools, washing cars and general cleaning activities.

Actual external water use will vary significantly depending on regional differences, such as rainfall and soil type. The greatest variation will relate to watering of gardens. Figure 4.6 shows the predicted water needed, on average, each month for a number of locations within SEQ, based on climate information, soil type and a range of other factors. Figure 4.7 predicts the number of times a garden needs to be watered for the same locations, on average. Both figures are based on an assumption that residents use efficient irrigation, watering only when necessary.

Together, these figures illustrate that:

- residents in coastal locations should use less water on their gardens, on average, than similar residents located in inland regions, due primarily to rainfall patterns
- soil conditions should significantly affect the frequency of watering, as distinct from the volume of water used.

For instance, Ipswich has generally loamy soils. In an average September, it is predicted that a gardener in this location would need to water their garden twice in a month, delivering the equivalent of 160 litres per person per day. By comparison, Maroochydore has very sandy soils and more rainfall, meaning that the same gardener would need to water their garden four times in the month but only use the equivalent of about 140 litres per person per day.

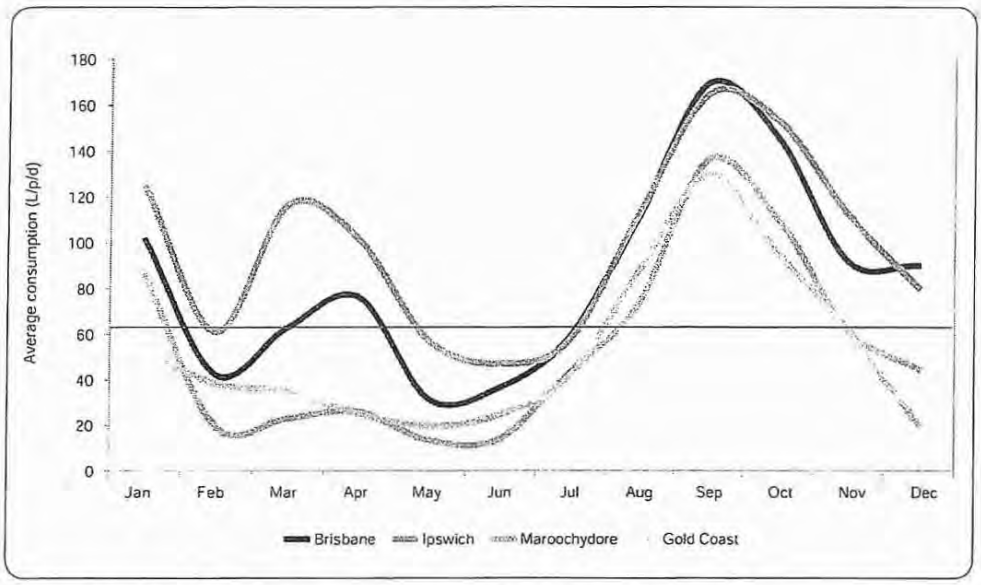


Figure 4.6 Forecast average external water use by location and month

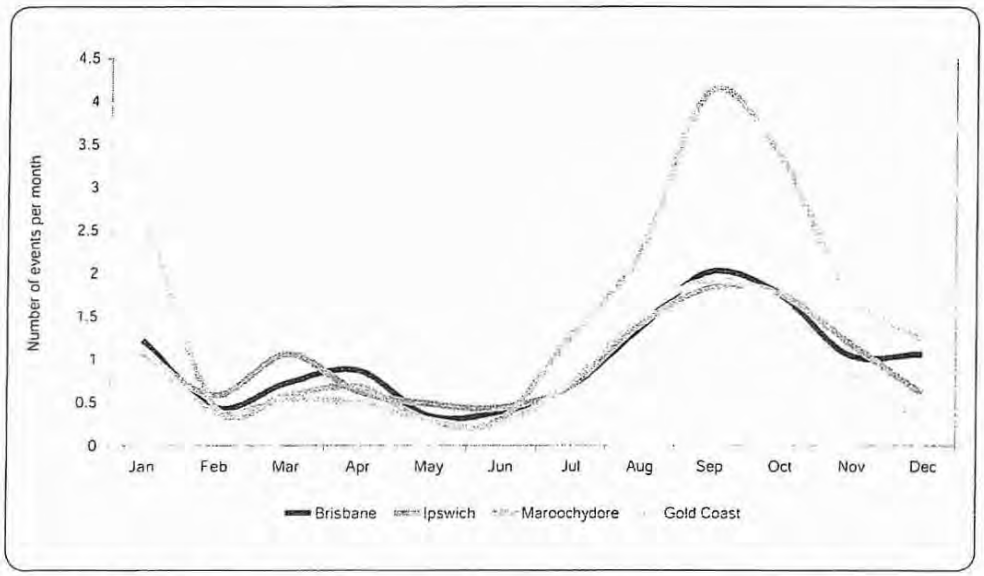


Figure 4.7 Forecast average number of watering events by location and month

4.4 Measures currently being implemented

Responses to the Millennium Drought included a number of demand management measures.

There are three categories of water efficiency measures:

- structural—making sure that our homes and businesses have water-efficient devices, appliances and equipment installed
- operational—making sure that water-efficient equipment is used correctly to achieve efficient outcomes
- behavioural—encouraging good use water behaviours and ensuring that the community understands the benefits of conserving water.

Table 4.3 gives information about the measures that have been implemented and factored into demand forecasts. These measures are long-term, as explained in Chapter 6.

Section 6.3.2 contains further demand management measures for investigation, to support achievement of the WUE objectives. Ongoing monitoring and review of water usage will be needed to determine the effectiveness of the program, including the potential to further reduce regional water consumption without significantly affecting our lifestyle, environment, or business and industry.

Drought response measures were identified during the early phases of Strategy development. A detailed and comprehensive assessment was conducted of some 100 potential measures across all customer sectors and involved a range of implementation mechanisms. Potential demand management measures were screened based on the following criteria:

- significance of water savings from a regional perspective
- sustainability of water savings from a regional perspective
- reductions in energy use
- improved public awareness
- likely public acceptance
- equity across customer base
- regulatory obstacles
- life cycle cost to customers
- life cycle cost to water service providers.

The annualised cost of potential measures was compared to the cost of potential sources of supply. Annualised cost is the cost of the measure divided by the amount of water that it will save each year. On this assessment, the measures proposed in the Strategy were generally cost-effective relative to potential sources of supply. Figure 4.8 illustrates the annualised cost of some of the potential demand management measures, based on the initial planning assumptions. More detailed economic analysis was undertaken for significant measures, including levelised[1] cost assessments and portfolio analysis, which is explained in Section 6.3.2.

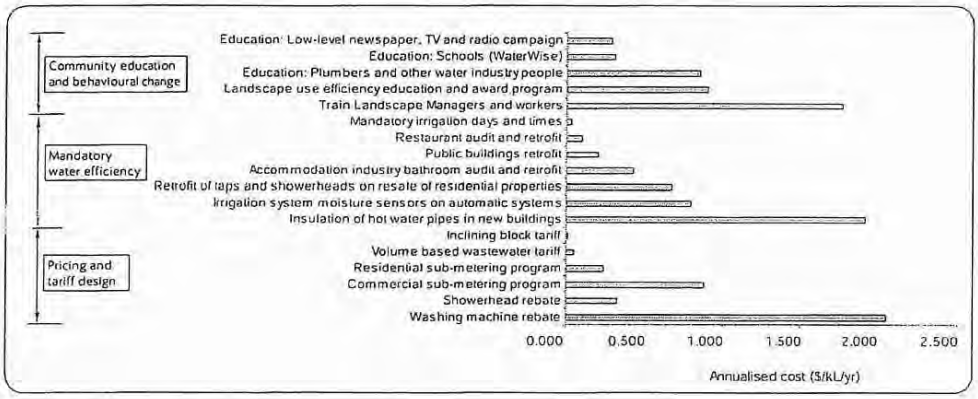


Figure 4.8 Annualised cost of potential demand management measures

[1] Levelised cost is calculated as the ratio of the present value of projected capital and operating cost of an option to the present value of the projected annual demand supplied or saved by the option.

Table 4.3 Permanent efficiency measures

Structural water efficiency measures
Water efficiency management plans Water efficiency management plans (WEMPs) are required to be prepared for large water-using businesses and other non-residential activities. Under a WEMP, businesses must assess their current water use and identify and implement water savings. The plans demonstrate if a water user is already at best practice in water efficiency, or how a user is planning to become water-efficient in the near future. All businesses using 10 megalitres per year or more must prepare, submit and comply with a WEMP. WEMPs are also required for public swimming pools, nurseries, turf farms and market gardens, and premises with cooling towers. WEMPs are a long-term measure. Businesses that are subject to a WEMP are required to review and update their WEMP at least every five years, with the aim of achieving business best practice water efficiency. All businesses must ensure that their urinals and cooling towers are efficient, and businesses using 1 megalitre per year or more must ensure that all internal water fittings on the premises are water-efficient.
Queensland Development Code Part 4.1—sustainable buildings Since 1 March 2006, new houses in Queensland are required to use water and energy more efficiently. Detached houses, terrace houses and townhouses must contain water-efficient showerheads and toilets, and water pressure limiting devices. Units must have water-efficient showerheads and toilets. Homes undergoing bathroom renovations must include water-efficient showerheads and taps.
Queensland Development Code Part 4.2—water savings targets Since 1 January 2007, all building development applications lodged for the construction of new homes in SEQ must meet mandatory water savings targets. Detached houses must target savings of 70 000 litres per year, while terrace houses and townhouses must aim to achieve savings of 42 000 litres per year. Internally plumbed rainwater tanks are one option to achieve the water savings target. Alternative solutions to achieve the water savings target include communal rainwater tanks, stormwater harvesting, dual-reticulation recycled water schemes, and the treatment and reuse of greywater.
Queensland Development Code Part 4.3—alternative water sources, commercial buildings From 1 January 2008, most new commercial and industrial buildings are required to have alternative water sources. Options include internally plumbed rainwater tanks and treated greywater.
Topping up swimming pools Water from the reticulated supply system may be used for topping up swimming pools only if a rainwater tank or downpipe rainwater diverter is installed. The pool must also be an accredited ecopool or the premises must comply with three of four water efficiency measures, namely the use of: • a swimming pool cover • water-efficient taps and showerheads • water-efficient toilets • water-efficient washing machines.
Pressure and leakage reduction program The Queensland Government has collaborated with local governments to reduce supply pressure and distribution system leakage losses by 60 megalitres per day by 2012. As at March 2010, a reduction of 52 megalitres per day had been achieved.
Expanded use of greywater Allowable uses for greywater have been expanded where appropriate, through setting treatment standards and amending the types of buildings eligible to install greywater use facilities. Commercial and industrial building owners are allowed to reuse greywater captured within their buildings. These provisions commenced on 1 January 2008 and allow treated greywater to be used for toilet flushing, laundry use, vehicle washing, washdown of paths or walls, and spray irrigation of lawns and gardens.
Installation of water meters Accurate water usage data is a critical factor for effective water use management. Individual water meters must be installed in all new residential and commercial multi-unit developments. In addition, businesses must install sub-meters: • on the supply line of any process or equipment that uses a significant portion of the total water use on the site • on the supply line of an irrigation system that irrigates an area greater than 500 square metres.

Operational water efficiency measures

Guidelines for business

Working with industry, the QWC has developed water efficiency guidelines that identify water-efficient equipment and practices to assist businesses and commercial operators. The guidelines cover a range of business and sporting operations, from fixed commercial vehicle washing to playing surface management. Generally, operators must:

- use water-efficient equipment, appliances, accessories and products that enhance water efficiency
- undertake activities in a water-efficient manner in accordance with manufacturers' instructions and equipment and training requirements
- check for leaks and, when a leak is found, undertake immediate repairs
- improve processes and upgrade to water-efficient equipment when it becomes economically feasible
- ensure that performance targets are met and equipment is maintained in good condition.

Active Playing Surfaces Guidelines

The Active Playing Surfaces Guidelines set out rules for irrigating grassed active playing surfaces to ensure that water is used efficiently while surfaces are maintained in a safe and playable condition. Over 620 registered active playing surfaces in SEQ use water in accordance with these guidelines.

Efficient Urban Irrigation Program

Irrigating outdoor areas can consume large amounts of water. The QWC has introduced the Efficient Urban Irrigation Program to improve the efficiency of outdoor water use for establishing and maintaining gardens and lawns around homes and businesses.

Irrigation systems must operate with a timer and a soil or rainwater moisture sensor. Irrigation must also be supported by efficient gardening practices. For business and commercial applications, a sub-meter must also be installed.

Residents and businesses operators are encouraged to choose landscaping elements that are appropriate to the climate and require minimal water to flourish.

The Efficient Urban Irrigation Program is based on the *Efficient Irrigation for Water Conservation Guideline*. The guideline has been granted the Smart Approved WaterMark and links to the use of efficient products which can be identified by the Smart Approved WaterMark.

Mobile commercial operator training and registration programs

Water is the primary input to the businesses of many mobile commercial operators, such as mobile car washing businesses, external cleaners and pet washers, making it important that these businesses operate in a water-efficient manner. The QWC developed Water Efficiency Guidelines to ensure operators are trained in efficient water use practices. By the end of 2009, 1130 operators were registered, trained in efficient water use, and operating according to the QWC guidelines.

Behavioural water efficiency measures

Rebate schemes

The Queensland Government and a number of local governments have provided rebates for installing rainwater tanks and water-efficient devices, including dual-flush toilets, showerheads, washing machines and swimming pool covers. In some instances, increased rebates were offered for rainwater tanks that had been plumbed to internal fixtures.

More than 580 000 rebates were paid under the Queensland Government's WaterWise Rebate Scheme, with a total estimated value of almost $330 million. Rebates were paid to retrofit rainwater tanks to 236 000 houses and to provide water-efficient showerheads and other fittings.

Water-efficient showerheads continue to be available through the Queensland Government's ClimateSmart Home Service.

ecoBiz is a Queensland Government program that provides rebates to help businesses save money through reduced energy and water consumption, and reduced waste.

Public education and communication

The QWC implemented successful public education and communication campaigns, including Target 140, Target 170 and Target 200, to encourage residents of SEQ to reduce their water use and to use water efficiently. A separate campaign, Water at Work, promoted water efficiency in the workplace. Further community and business education campaigns will be undertaken as required and to support the voluntary Target 200.

WaterWise

The WaterWise program targets particular sectors of the community and seeks to establish efficient lifetime water consumption habits. *Water: Learn it for life!* has been developed for preparatory and primary school children. The program is administered by the Department of Environment and Resource Management.

Council water savings and efficiency education programs

Many local governments provide educational information and water savings tips and toolkits for households and businesses. Some local governments also offer water efficiency rebates.

Behavioural water efficiency measures (continued)

Water use information to residential tenants

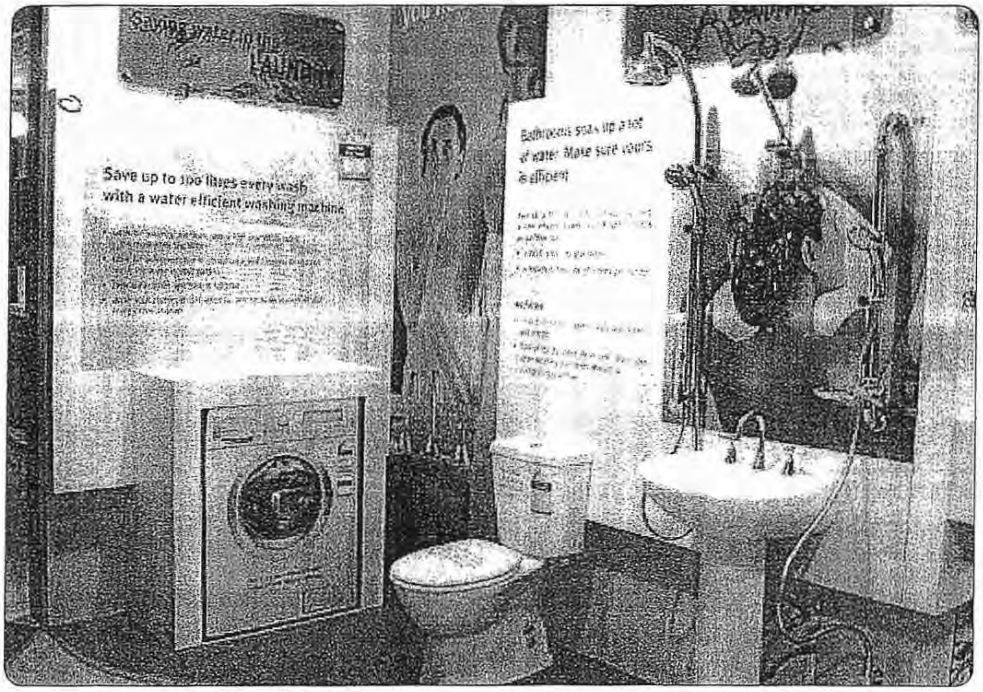
This measure requires water service providers to give water use information to occupiers of residential rental properties. The advice states the volume of water supplied to the premises during each meter-read period so residents can monitor their water use.

Water efficiency calculator

The QWC has developed a water efficiency calculator to help residents and business operators become more water-wise. The calculator determines water usage volumes in and around the household or premises, using information provided by the user. The calculator suggests water savings tips and enables residents to compare estimated water usage with metered water usage.

Water-efficient technologies display

A water-efficient technologies display has been established at the Home Ideas Centre in Brisbane. The display features a range of water-efficient devices, appliances and fixtures and promotes water-efficient technology to people building or renovating a home.



4.4.1 Role of rebate schemes

The demand management program focuses on structural measures that will continue to provide cost-effective savings well beyond the time when additional sources of supply are required. The main focus is for new houses and commercial and industrial buildings to be water-efficient—for example, by using water from rainwater tanks to flush toilets or for other purposes. Unless many of these measures are undertaken now, the opportunity could be lost and the future cost of retrofitting would be prohibitive.

With these requirements in place, substantial water savings will be achieved through natural replacement of the building stock, either when constructed or as part of renovation.

Most of the rebate schemes have now been discontinued. They were effective in bringing forward demand savings as part of a drought response. However, they are less cost-effective when LOS system yield exceeds demand, and when similar demand savings will be embedded over time through regulation and the natural replacement of fittings and fixtures.

Refer to behavioural water efficiency measures in Table 4.3 for more information on rebate schemes.

Examples of measures implemented by non-residential users

Industrial water recycling—BP and Caltex refineries

Since 2000, the BP Amoco Refinery at Bulwer Island in Brisbane has been using an average of 3650 megalitres per year of recycled water. Since May 2008, the Caltex refinery at Lytton has been receiving 1600 megalitres per year of high-quality recycled water from the nearby Wynnum Wastewater Treatment Plant. Both of these projects use the recycled water for boilers and cooling towers, and are examples of recycled water substitution that will directly reduce the demand on drinking water supplies.

Industrial water management—Dairy Farmers, Ipswich

Dairy Farmers is one of the largest dairy manufacturers in Australia. Recent improvements at the Booval Dairy Farmers plant have led to greater recovery and reuse of water, allowing the plant to reduce water consumption by 25 per cent. An additional benefit is that wastewater discharge from the plant has been reduced.

Commercial water management—Conrad Jupiters Casino

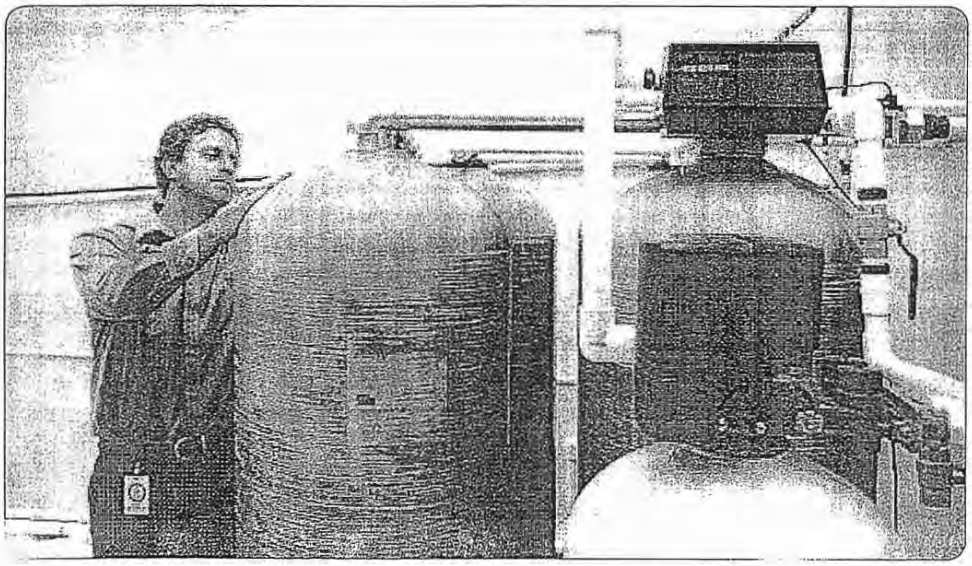
Conrad Jupiters Casino on the Gold Coast has reduced its potable water consumption by 37 per cent. Key initiatives include installing water-efficient fittings on showers, taps and urinals; a recycled water treatment facility for garden irrigation; dual-flush toilets; and rainwater tanks for topping up swimming pools.

Government buildings—Water SMART Buildings

This program reduced water consumption in Queensland Government–owned commercial buildings, facilities and parks. High water use facilities were targeted with a program of works to improve their water efficiency. Projects included replacing single-flush toilets and installing water-efficient tapware, showerheads and flow restrictors. A reduction in potable water consumption of approximately 55 per cent was achieved in 37 government buildings in SEQ when comparing 2004–05 and 2008-2009 annual water usage data.

Rural water use efficiency—SEQ Irrigation Futures

The SEQ Irrigation Futures project was established to improve the efficiency and off-farm impacts of irrigation. Participating industries include horticulture, dairy and fodder, turf, flora, and nursery and garden sectors. A key objective is to provide research and development, which has underpinned a 12 per cent improvement in water use efficiency as at the end of 2009—equivalent to an estimated 21 000 megalitres per year. Technologies and management practices for improved irrigation practice have been developed, trialled and evaluated through water balance models, spatial variability assessments, zonal irrigation management and 'tool kit' support for industry consultants.



4.5 Forecast demand

Based on 2004–05 trends, demand for water for urban uses and power generation would have increased from around 467 000 megalitres per year in 2005 to approximately 985 000 megalitres per year in 2056. With high series population growth, demand would have increased to around 1 196 000 megalitres per year.

Overall, a reduction in demand of 24 per cent compared to 2004–05 patterns is forecast by 2056. Table 4.4 contains the current demand forecasts, based on the planning assumptions outlined above. It also takes into account projects and initiatives currently being implemented and the demand management program described in Section 6.3.

Table 4.4 Forecast SEQ urban and power generation demand (excluding rural allocations)

	2005 estimated water consumption (megalitres per year)	2026 forecast demand (megalitres per year)	2056 forecast demand (megalitres per year)
Medium series population projections			
Pre-drought trends	466 693	690 000	985 000
Strategy forecast demand management program	–	533 000	744 000
Per cent saving	–	23 per cent	24 per cent
High series population projections			
Pre-drought trends	466 693	749 000	1 196 000
Strategy forecast demand management program	–	577 000	914 000
Per cent saving	–	23 per cent	24 per cent

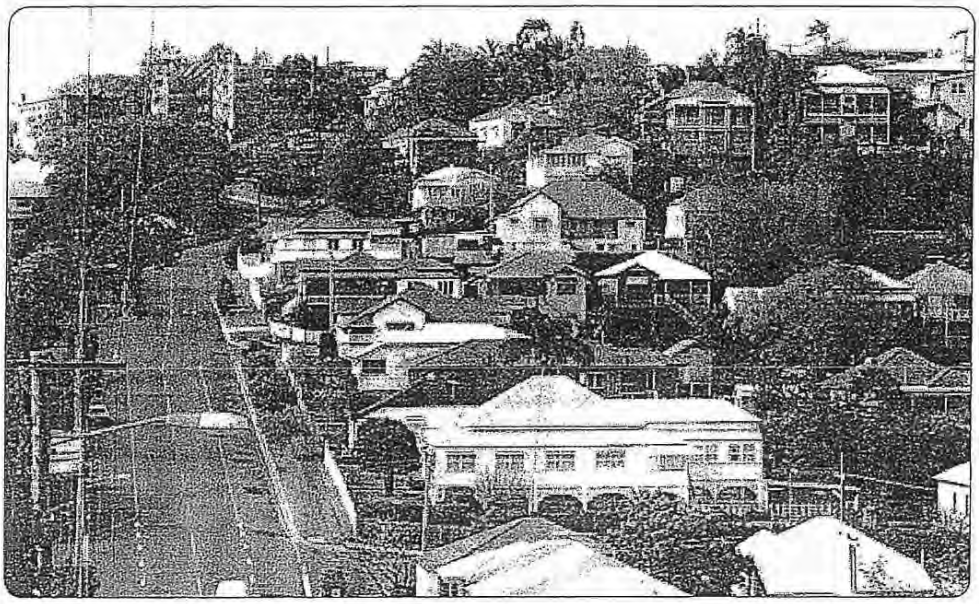


Figure 4.9 illustrates forecast demand over time, in total and for key sectors. A demand range has been prepared to ensure that the Strategy is flexible enough to respond to changes in population growth or consumption trends. Cases where water savings initiatives within the high series forecast are slower to come into effect, or do not fully materialise, are expected to be within the range.

The Toowoomba and Cooloola local government areas are not part of SEQ. However, the pipeline connecting Wivenhoe Dam to Cressbrook Creek Dam provides the capacity to supply up to 10 000 megalitres per year of untreated water to Toowoomba Regional Council. This potential supply has been included in the modelling of future demand.

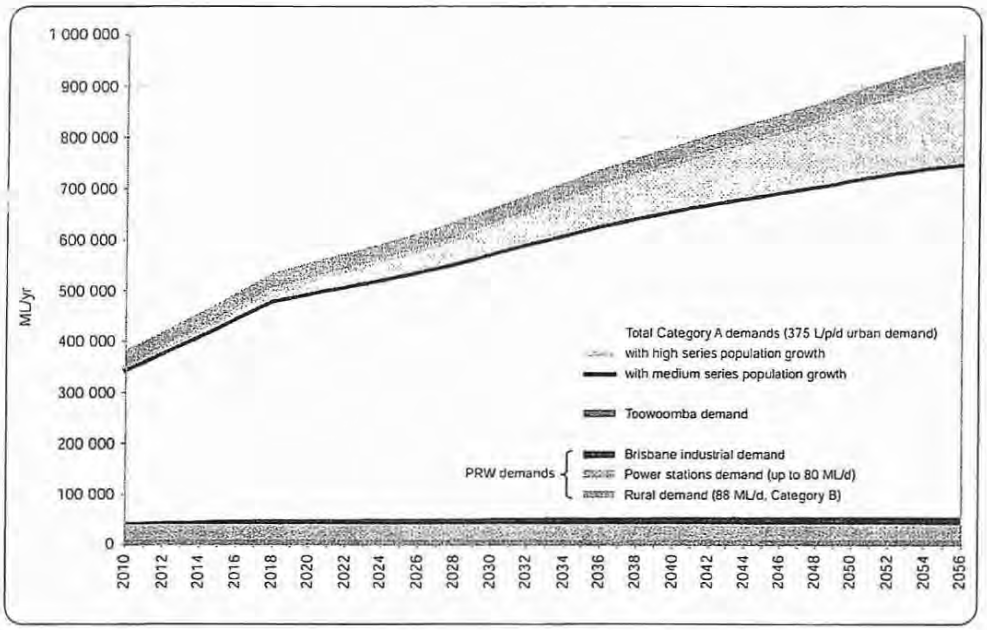


Figure 4.9 Forecast demand

4.5.1 Forecast urban demand

Before 2005, residential use accounted for around 65 per cent of urban demand. The relative proportion of residential water use is projected to decline slightly to about 58 per cent of urban water use by 2056.

Non-residential water use (excluding system losses and power generation) represented approximately 21 per cent of total urban water use in 2005. Non-residential demand is forecast to increase from about 91 000 megalitres per year in 2005 to about 117 000 megalitres per year in 2026 and about 172 000 megalitres per year in 2056, based on medium series population growth. At these rates, non-residential water use is forecast to comprise about 24 per cent of urban demand in 2056.

4.5.2 Forecast power generation demand

In 2005, about 38 000 megalitres was used for power generation in SEQ, equivalent to 6 per cent of total consumption. Most of the water was used in coal-fired power stations.

Since 2005, SEQ power stations have implemented a range of water-saving measures that have permanently reduced demand on the SEQ Water Grid. At the Swanbank B and E power stations, these measures include stormwater collection to supplement cooling water. At the Tarong and Tarong North power stations, the measures include installation of a reverse osmosis plant to recycle stormwater, boiler blowdown water and ash dam water.

Demand will also be reduced by the progressive closure of the Swanbank B power station over the period to mid-2012. Potentially offsetting this, CS Energy has long-term plans to build another gas-fired power station at the site. Power stations may also be built elsewhere in the region at some stage.

Taking these factors into account, the Strategy allows for supply to power generation of up to 29 500 megalitres per year. This is a conservative assumption, based on existing contracts. Actual consumption in any year may be lower, due to lower demand for electricity or to the Tarong power station taking water from Boondooma Dam rather than from the SEQ Water Grid.

When accessing water from the SEQ Grid Water, the Swanbank, Tarong and Tarong North power stations will use purified recycled water from the Western Corridor Recycled Water Scheme. For the Swanbank and Tarong North power stations, purified recycled water is the primary source of supply. For the Tarong power station, the primary source of supply will continue to be Boondooma Dam, with purified recycled water being used when supply is unavailable from the dam.

4.5.3 Forecast rural community demand

In the future, demand for water in rural communities with stand-alone supplies is expected to remain at approximately 1 per cent of total SEQ demand.

These demand forecasts were derived from the October 2006 population growth forecasts from the former Department of Local Government, Planning, Sport and Recreation. An assumption has been made regarding the proportion of future connected and unconnected properties in each local government area.

Section 6.5 provides more information on securing water supplies for all rural communities, both with and without reticulated supplies.

4.5.4 Forecast rural production demand

The growth in rural activities in SEQ is limited by the availability of water, with some restrictions on land use. With the current allocations of water available under the water resource plans, there are only limited opportunities for growth in the rural sector in terms of hectares under irrigation. Within this area, there may be changes to the types of crops and rural activities driven by the national water reforms and other initiatives.

Section 6.6 explains commitments made regarding additional water for rural production. If this water is not taken into account, rural water consumption is likely to remain at around 150 000 megalitres per year, which is the amount used in 2005.

4.5.5 Supply to areas outside SEQ

A pipeline between Wivenhoe Dam and Cressbrook Creek Dam was completed in early 2010. Through this pipeline, the SEQ Water Grid can initially supply up to 10 000 megalitres per year to Toowoomba Regional Council. The conditions of supply have been specified in a contract with Toowoomba Regional Council. This supply is allowed for in water balance models.

Supply to other areas outside SEQ may be considered subject to appropriate terms and conditions, including that the security of supply to SEQ is not reduced below the LOS objectives (refer to Section 6.1).

4.6 Local water supplies

Local water supplies are an integral part of the Strategy. These local supplies will complement supply from the SEQ Water Grid, helping to reduce the amount that needs to be supplied from bulk water supplies and the distance over which it is transported.

Development of local water supplies is required under the Queensland Development Code's water savings targets for new residential, commercial and industrial buildings. As noted in Table 4.3, since 1 January 2007 all building applications in SEQ for detached houses must target savings of 70 000 litres per year, while terrace houses and townhouses must aim to achieve savings of 42 000 litres per year. These local supplies must be internally plumbed to provide water for, at a minimum, toilet flushing and washing machine cold water taps, as well as for outdoor use.

The water savings target is forecast to apply to about 500 000 new houses by 2026 and about 800 000 new houses by 2056. At this rate, local supplies in new houses are forecast to reduce demand for the SEQ Water Grid water by about 35 000 megalitres per year by 2026 and 60 000 megalitres per year by 2056. The actual number of new houses depends on a range of factors including population growth and household size. The forecast takes into account variations in the yield of rainwater tanks across the region. These forecasts are based on the minimum requirements.

Internally plumbed rainwater tanks are one option to achieve the water savings target. Other options to achieve the water savings target include communal rainwater tanks, stormwater harvesting, greywater, and dual-reticulation recycled water systems. These options can benefit other elements of the water cycle, as described in Section 2.3.

The most appropriate solution to the water savings target will vary depending on local circumstances, and should be determined as part of the planning processes described in Section 2.3. In key development areas, the optimal solution may be specified as part of sub-regional total water cycle planning. In other locations, it may be considered on a site-specific basis by developers or as part of local government total water cycle planning.

In some circumstances, local water supplies may be able to deliver savings above the minimum required under the Queensland Development Code. These opportunities should be investigated and pursued when the incremental benefits are cost-effective compared to alternative sources of supply. Potential economic benefits of these options include:

- reducing and deferring the need for major supply augmentation
- reducing or avoiding the need for upgrades to the water distribution system
- reducing whole-of-system operating costs
- reducing the overall demand for water.

These opportunities should be assessed on a total water cycle basis, taking into account environmental and social considerations (refer to Section 3.5). Local water supplies can have significant benefits for the local environment. For example, local recycled water schemes can significantly reduce nutrient discharges from wastewater treatment plants, improving the health of receiving waterways and estuaries. These benefits vary between schemes, depending on a range of factors including the treatment process and the other flows in the receiving waterway. Other issues, such as energy intensity, must also be taken into account—local supplies can be more or less energy-intensive than bulk water supplies (refer to Section 6.8.3).

Demand for SEQ Water Grid water will be further reduced by existing tanks including those retrofitted to existing houses during the drought response and tanks on new industrial and commercial buildings.

With few exceptions, local supplies will be insufficient to achieve the LOS objectives described in Chapter 3. As a result, the water balance takes into account the amount of water that will be required to augment supplies from rainwater tanks during severe droughts.

4.6.1 Rainwater tanks

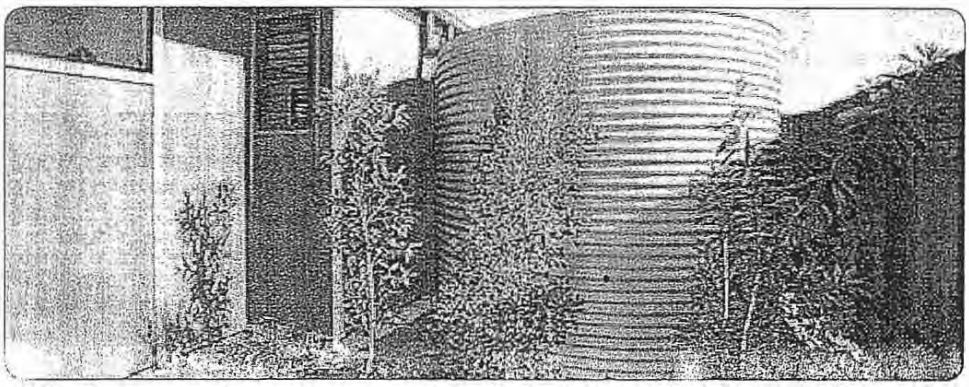
Rainwater tanks were installed in 236 000 homes in SEQ as part of the Queensland Government's WaterWise Rebate Scheme. This represents a penetration rate of almost one in four detached and semi-detached dwellings. These tanks enabled residents to reduce the impact of the drought on gardens while maintaining average consumption below 140 litres per person per day for over a year.

A large proportion of development in SEQ is located in coastal areas that receive higher rainfall than existing major dam catchments. Rainwater tanks and stormwater harvesting provide a way to capture some of this rainfall. Rainwater tanks are able to collect inflows from light rainfall, whereas dams may require 50 millimetres or more of rainfall in the catchment area before run-off commences.

The minimum requirements specified in the Queensland Development Code ensure that rainwater tanks are cost-effective compared to desalination and purified recycled water. This cost effectiveness is due to:

- cost being minimised by installing the tank and internal plumbing connections during construction
- yield being maximised by regulating the minimum size of the tank, connected roof area and plumbing into toilets and washing machines.

The savings that could be achieved for similar costs in existing homes are estimated to be considerably lower. Retrofitted rainwater tanks are generally less cost-effective due to smaller tanks, smaller connected roof area and fewer, if any, internal connections such as to toilets or washing machines. Further work is planned to improve the yield, energy efficiency and cost-effectiveness of rainwater tank systems installed in new dwellings.



4.6.2 Stormwater harvesting

Stormwater harvesting involves collecting and storing stormwater, then treating and using it at a later time. The appropriate use depends on the quality of treatment. Undertaken as part of water-sensitive urban design, stormwater harvesting has the potential to reduce the impacts from urban development on local waterways, rivers and Moreton Bay. These benefits relate to:

- reducing the quantity of pollutants entering waterways, by trapping and filtering pollutants before discharge and use
- reducing the volume, intensity and frequency of stormwater run-off and stream flow, which helps to maintain in-stream habitats and bank stabilisation.

Stormwater harvesting can vary from on-site scale, such as a shopping centre or industrial development, to regional scale. At the on-site scale, stormwater harvesting may involve capturing and reusing water for use in toilets and for outdoor irrigation. Storage could be provided in underground tanks under car parks or internal roads.

At the local scale, run-off from a new development area might be collected in a wetland for treatment and used for outdoor irrigation or through a dual-reticulation system. At the sub-regional or regional scale, stormwater harvesting might involve collecting run-off from a large catchment area that includes urban and rural areas. The water may be treated to a high standard and used to supplement drinking water supplies.

In a number of greenfield development scenarios, stormwater harvesting could deliver water supply to meet or exceed the water savings targets at a cost comparable to or lower than rainwater tanks.

It is most likely to be cost-effective in developments where:

- the density of development is high, increasing the demand for water and decreasing the unit cost
- the development is large, providing the opportunity for economies of scale
- land is available for surface water storage that does not reduce lot yield, such as low-lying land that would be drainage reserve or passive parkland
- moderate to steep catchments allow for drainage and storage to limited areas.

Similar to rainwater tanks, it is generally more cost-effective to install stormwater supply systems as part of new developments.

Stormwater harvesting could more efficiently achieve both the water savings targets and water-sensitive urban design requirements than if these requirements were addressed separately.

The QWC will also consider opportunities to use managed stormwater harvesting to augment:

- bulk water storages, such as occurs in Orange in New South Wales
- recycled water flows as part of the detailed investigations of potential purified recycled water schemes. Such schemes could have significant benefits for waterways, due to capturing the first-flush stormwater.

The Queensland Government is undertaking more detailed research to assess opportunities for stormwater harvesting in SEQ, as explained in Section 7.4. This includes investigating where large stormwater harvesting schemes could be developed. Much of the research also relates to the health risks that must be managed due to the variation in the quality of stormwater between locations and over time. At present, the cost of meeting regulatory requirements for stormwater use will be a significant factor in determining the viability of such schemes.

The Queensland Government is investigating a number of potential demonstration projects, as summarised in the following text box.

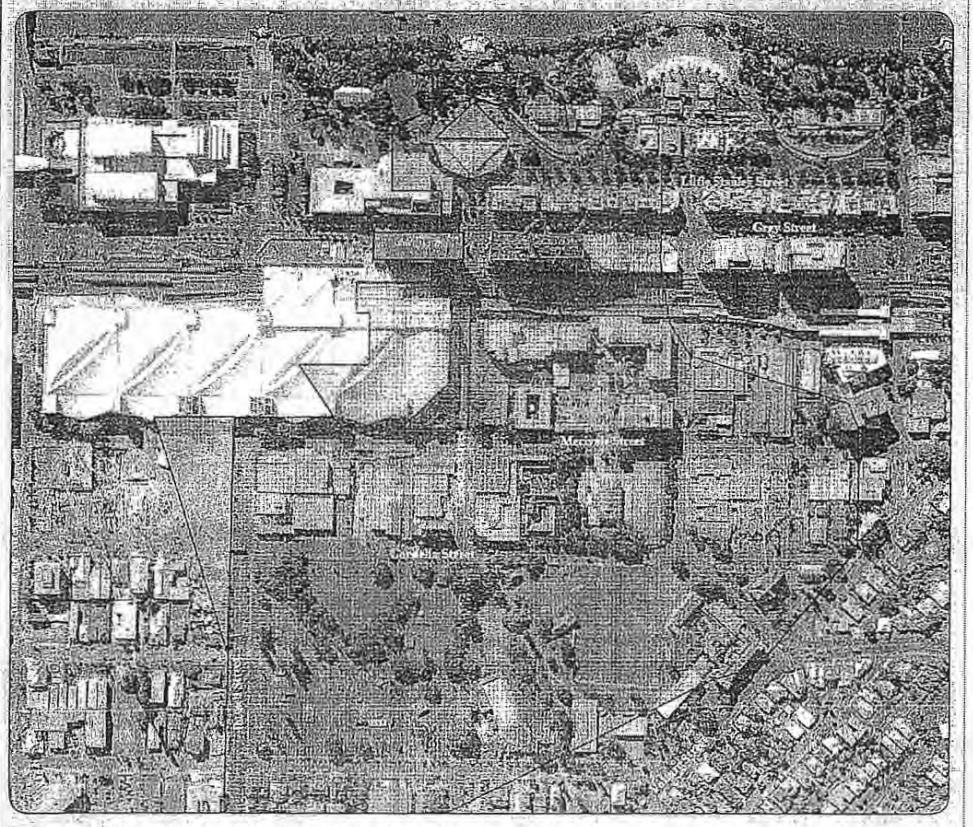
Stormwater harvesting at South Bank

The South Bank Stormwater Harvesting and Recycling Centre (SHARC) will harvest water from a highly urbanised catchment, providing a basis for research. Construction is scheduled to be completed by late 2010.

The scheme involves harvesting stormwater run-off from a 30 hectare urban catchment extending from South Bank into West End. Water will be extracted from a diversion pit in front of the Suncorp Piazza. The water will be treated before being pumped into an underground storage tank and again before distribution. The plant room will include opportunities for community viewing and education.

The SHARC project is expected to supply approximately 77 megalitres per year of treated stormwater. Initially, the water will be used for irrigation, water features and toilet flushing. Once potential water quality issues have been investigated, the water could be used to top up the South Bank pools.

The Queensland Government is contributing $3.3 million to the project. The Australian Government is contributing $4.6 million.



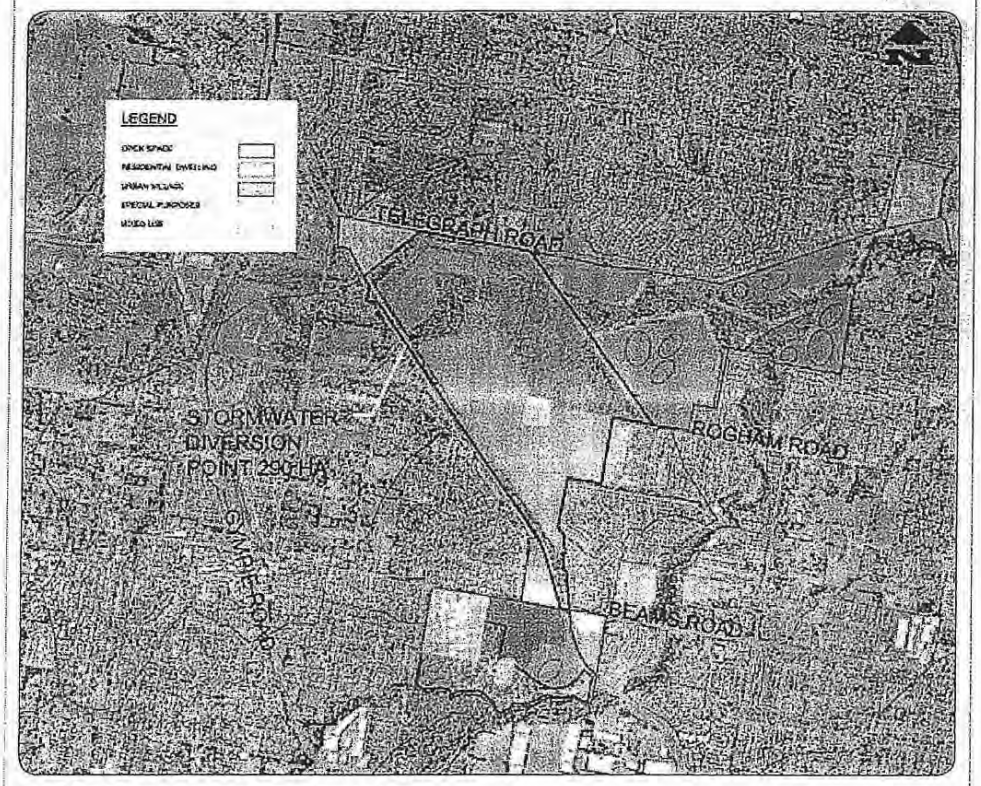
Catchment feeding the South Bank stormwater harvesting scheme

Fitzgibbon Chase

The Fitzgibbon Chase development is an innovative housing affordability initiative, combining recreational, cultural, education, business and medium-density residential development. The Urban Land Development Authority, in partnership with the QWC, is investigating whether a stormwater harvesting scheme could be constructed within the development.

The proposed Fitzgibbon Stormwater Harvesting (FiSH) scheme would divert urban stormwater run-off from an adjacent 290 hectare urban catchment, storing the water in a 5 megalitre urban lake. Stormwater would be treated and distributed to houses and units through a dual-reticulation system. Treated stormwater would be used for toilet flushing, cold laundry taps, garden irrigation and outdoor use.

The FiSH scheme would supply about 89 megalitres per year—about 84 per cent of the development's non-potable demand.



Fitzgibbon Chase stormwater harvesting catchment

4.6.3 Local recycling

Local recycling is an option to achieve the Queensland Development Code's water savings requirement for new dwellings. As with stormwater harvesting, local recycling is more appropriate for offsetting demand from larger scale greenfield industrial or residential developments rather than single properties or brownfield sites.

Apart from purified recycled water, other types of water recycling may provide additional water supplies for the region. Such recycling opportunities may involve:

- wastewater from a wastewater treatment plant that is not part of a purified recycled water scheme
- excess wastewater from a wastewater treatment plant that is surplus to the requirements for any local purified recycled water scheme
- water that is extracted from the sewerage system and treated locally
- greywater.

A feature of recycled water is that the treatment process and water quality can be tailored to suit the use, optimising the capital and operating costs. Where treated wastewater is not fully upgraded to purified recycled water, it might still be of a suitable quality to be used for:

- agricultural applications such as irrigation
- parkland irrigation
- industry activities
- toilet flushing and outdoor irrigation in residential developments, through a dual-reticulation system.

The optimal type of recycling in a particular location, if any, will be considered as part of the total water cycle planning process outlined in Section 2.3. Sub-regional total water cycle plans will incorporate a receiving water load-based analysis, taking into account the costs and benefits of recycling and reuse across the study area. Local recycling will be a key consideration in the first sub-regional total water cycle plan for key growth areas in Logan City Council and Scenic Rim Regional Council areas.

Dual-reticulation recycled water schemes

Dual-reticulation recycled water schemes involve constructing separate distribution systems for drinking water and recycled water. In residential areas, the recycled water is plumbed to homes for flushing toilets and outdoor irrigation. Dual-reticulation recycled water schemes can result in a high percentage of recycled water reuse and potentially reduce the impact of any future water restrictions.

A permanent reduction in average outdoor water use could have a negative effect on the economic viability of dual reticulation recycled water schemes. The amount of water supplied would reduce without equivalent savings in terms of the cost of constructing and operating the scheme. As with stormwater, the viability of dual-reticulation systems need to be assessed based on the characteristics of a specific site.

Pimpama Coomera WaterFutures Master Plan

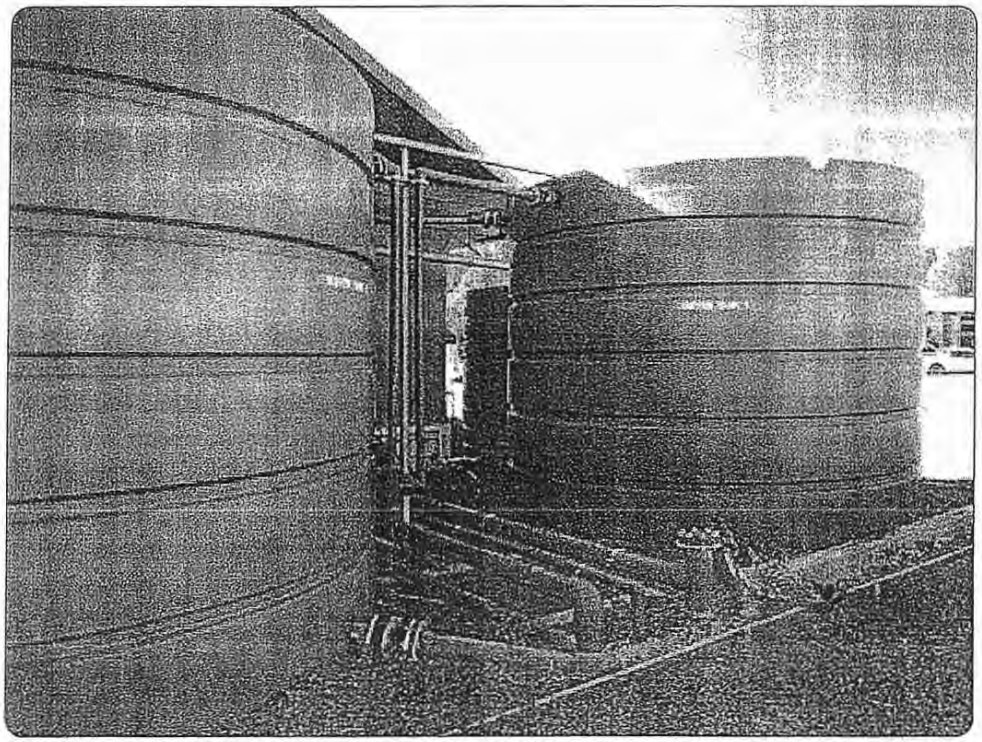
The suburbs of Pimpama and Coomera at the northern end of the Gold Coast are expected to grow from approximately 15 000 people to around 120 000 people by 2056[2]. The Pimpama Coomera WaterFutures Master Plan has been developed by the Gold Coast City Council and is the largest integrated water cycle management program in Australia.

The Master Plan aims to reduce the use of potable water in new homes by up to 84 per cent. Under the Master Plan, all new homes will be supplied with recycled water for toilet flushing and outdoor use. Rainwater tanks will be installed to supply washing machines.

Greywater systems and wastewater mining

Greywater systems can help to reduce demand for potable supplies. These must be carefully managed, due to potential health risks. The Queensland Government introduced new laws in March 2006 to broaden the use of greywater. Under this legislation, anybody is allowed to manually bucket greywater from the laundry and bathroom, or to connect a flexible hose to divert it from the washing machine to the garden. An application to the local government is required for more sophisticated systems, such as a diverter unit or treatment plant. Such systems must be installed by a plumber licensed in Queensland and must meet Australian standards.

Wastewater mining (where wastewater is pumped directly from the sewer, treated and used on-site) is a minor element of the Strategy, due to cost. With advances in technology, wastewater mining may become more economically viable and schemes may be developed where treated wastewater is available.



2 Source: http://www.goldcoastwater.com.au/t_gcw.aspx?PID=7994

Chapter 5

South East Queensland's water supplies

This chapter describes existing and committed water supply sources for SEQ. It explains the yield of these sources using the Level of Service (LOS) approach outlined in Chapter 3, including the benefits of the SEQ Water Grid and the potential impact of climate change. It also describes the opportunities identified for future water supplies, including potential desalination and purified recycled water schemes, as well as surface water and groundwater opportunities.

Key messages

- The SEQ Water Grid is operational, including the desalination facility at Tugun, the Western Corridor Recycled Water Scheme and major interconnecting pipelines.
- A number of other projects are currently underway, including the Hinze Dam upgrade and the construction of Wyaralong Dam.
- Operating the SEQ Water Grid as a single system increases the system yield by about 14 per cent compared to a disconnected system.
- The desalination facility and Western Corridor Recycled Water Scheme provide security of supply as standby facilities. They do not need to be operated at capacity at all times.
- The projects currently underway, including the Western Corridor Recycled Water Scheme, will increase the LOS system yield to 525 000 megalitres per year of high reliability (Category A) water around 2011, rising over time to its maximum capacity of 545 000 megalitres per year .
- An additional 32 000 megalitres per year of recycled water is available for rural irrigation when not required for urban supply.
- The climate change scenario adopted for planning analysis would reduce the yield of surface water storages and groundwater supplies by 10 per cent.
- The Strategy will be revised at least every five years as information on climate change impacts, population growth and water demands improves.
- Based on existing technology and identified alternative water source options, desalination is currently the only practical supply to fill a regionally significant supply gap.
- Priority desalination sites have been confirmed at Lytton and Marcoola. Reserve sites are at Tugun and Bribie Island.
- There are limited opportunities to substantially increase supply by developing new dams in SEQ, beyond those already committed.
- Groundwater in the SEQ region is considered to be almost fully utilised.

5.1 Existing water sources

In August 2006, the Minister for Infrastructure and Planning introduced a range of measures in response to the Millennium Drought in SEQ, including the construction of major new water assets. The measures are set out in the Water Regulation 2002 (Part 8) (Emergency Regulation). This program includes about 20 infrastructure projects, ranging from the first purified recycled water scheme in Australia to a number of local groundwater schemes and SEQ's first desalination plant.

Construction of the projects set out in the Emergency Regulation is almost complete. This section describes the existing bulk water supplies and major interconnections in SEQ as at mid-2010.

Figure 5.1 shows the current bulk water supplies in the SEQ Water Grid. The major surface water sources are:

- the Brisbane River system, comprising the Wivenhoe and Somerset dams, Lake Manchester and the Mt Crosby Weir
- North Pine Dam
- Hinze and Little Nerang dams
- Baroon Pocket Dam.

Borumba, Moogerah and Maroon Dams supply significant quantities of irrigation water. Lake Dyer, Lake Clarendon and Atkinson Dam are small dams that have been constructed specifically to deliver irrigation supplies.

The Cedar Grove Weir and Bromelton Off-stream Storage were operational from July 2008 and are being used to enhance the performance of the Logan River Water Supply Scheme for current entitlement holders. From 2012, these supplies will be operated in conjunction with Wyaralong Dam (refer to Section 5.2).

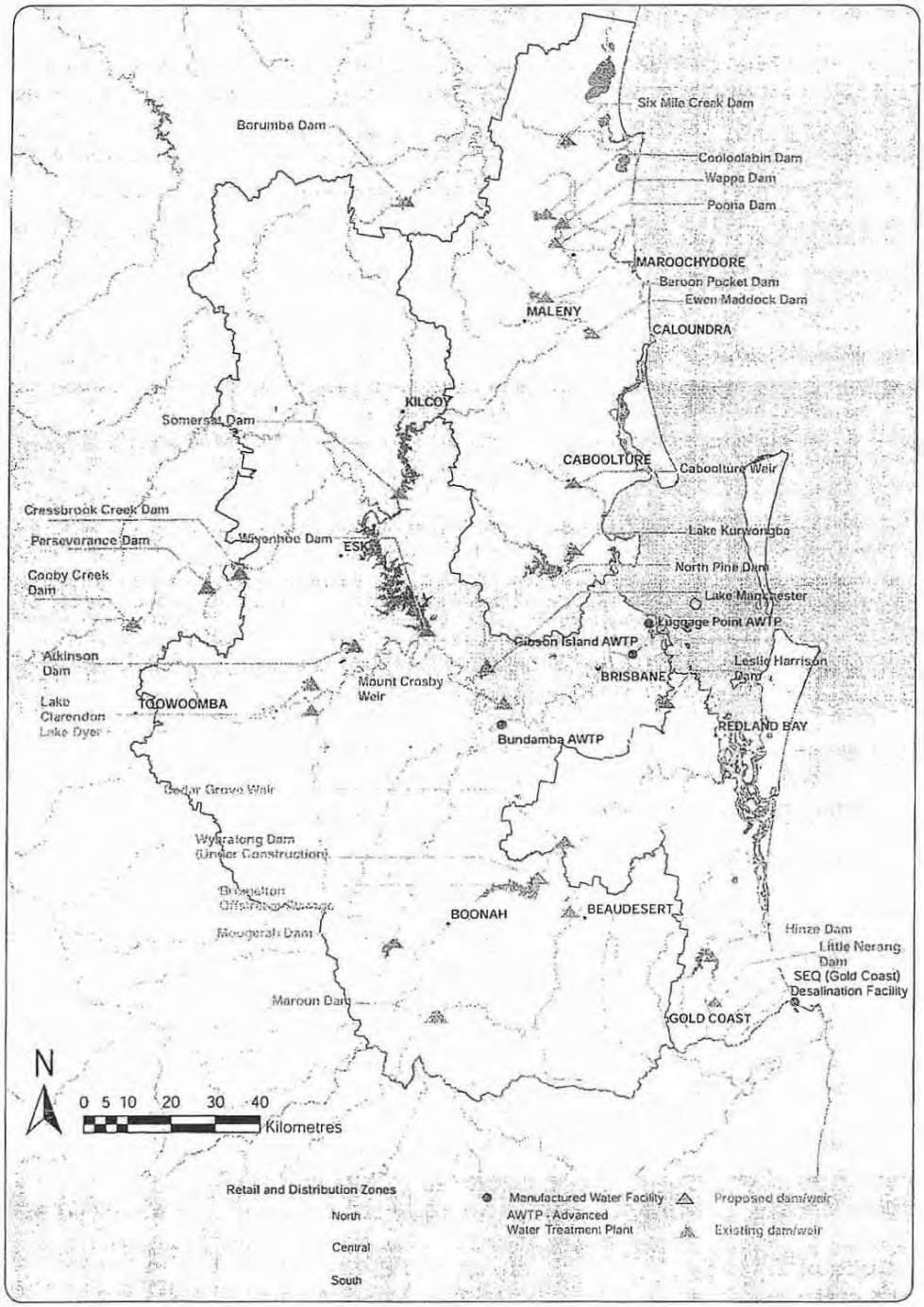


Figure 5.1 Existing bulk water supplies

Groundwater aquifers generally provide relatively high-quality water that, under the right circumstances, requires little treatment before use. In SEQ, water from groundwater aquifers currently supplies:

- significant quantities of drinking water to Bribie Island, Redlands, Toowoomba and some southern suburbs of Brisbane
- drinking water to small communities, such as those on North Stradbroke Island
- irrigation water to the Lockyer and Warrill valleys.

Private bores provide small quantities of water, mainly for garden irrigation. On Tamborine Mountain, some residents use private bores for drinking water supplies.

Two major new climate resilient water supplies have been constructed as part of the response to the Millennium Drought, namely the Western Corridor Recycled Water Scheme and the SEQ (Gold Coast) Desalination Facility, located at Tugun.

The Western Corridor Recycled Water Scheme is now the primary source of supply for water being taken from the SEQ Water Grid to the Swanbank, Tarong and Tarong North power stations. If insufficient purified recycled water is available for the power stations, backup supplies can be sourced from Moogerah Dam and the Brisbane River system. The Tarong Power Station also obtains supplies from Boondooma Dam, which is outside the SEQ Water Grid.

Cressbrook Creek, Perseverance and Cooby Creek dams supply water to Toowoomba and are owned by Toowoomba Regional Council. These dams, and the council-owned groundwater schemes, are not part of the SEQ Water Grid.

Bulk water interconnections

Bulk water interconnections are a key feature of the SEQ Water Grid and are at the core of future water security for the region.

Prior to the Millennium Drought, SEQ was supplied from eight largely discrete water supply zones, with differing levels of security and reliability and, until 2008, different owners and operators. Due to the lack of connection, restrictions were applied in some parts of the region while dams in other parts were full or overflowing. For instance, the Gold Coast experienced a severe drought in 2002, resulting in severe restrictions as well as plans to construct a pipeline from Brisbane. A few years later, while dams on the Gold Coast were overflowing, Brisbane was experiencing the most severe drought on record with the lowest recorded inflow into water storages.

Following the completion of most of the Emergency Regulation projects, there are now bulk water interconnections between most of the region's major water treatment plants. Figure 5.2 shows the new grid of interconnecting pipelines, featuring:

- the Southern Regional Water Pipeline, two-way between Brisbane and the Gold Coast
- the Eastern Pipeline Inter-connector, two-way between Redlands and Logan
- the Northern Pipeline Inter-connector Stage 1, between the Sunshine Coast at Caloundra and Brisbane.

These interconnections enable the coordinated management of treated water supplies across SEQ, allowing:

- water to be moved from areas of surplus to areas that face a shortfall
- risk to be managed on a regional level, rather than on an individual storage or system basis
- supply costs to be optimised, taking into account a range of factors including demand, storage levels and the variable costs of treating and transporting water.

In addition, a 38-kilometre pipeline connecting Wivenhoe Dam to Cressbrook Creek Dam has been completed. The pipeline became operational in January 2010, initially providing the capacity to supply up to 10 000 megalitres per year of untreated water to Toowoomba.

5.2 Projects currently underway

A range of catchment management works will soon be undertaken throughout the Logan River Basin. These works will be integrated with a total water cycle management plan for the Logan and Beaudesert areas, which seeks to optimise the overall outcomes for water supply, waterway health and wastewater management. The total water cycle management plans will incorporate the other projects currently underway, which are detailed below.

Wyaralong Dam is scheduled for completion by the end of 2011. Detailed planning of the Wyaralong water treatment plant is being led by a joint Seqwater—Department of Infrastructure and Planning project team. This planning will provide an accurate assessment of the construction timeframes and costs for the water treatment plant. In the latter half of 2010, the QWC will make a recommendation to the Queensland Government on overall timeframe for the water treatment plant based on the regional water balance and the construction timeframes and costs. The goal is to ensure that the water treatment plant is available to meet growth in demand in the most cost-efficient way.

Planning and preliminary design works have commenced for two interconnecting pipes to bring water from the Logan River system (Cedar Grove Weir, Bromelton Off-stream Storage and Wyaralong Dam) into the SEQ Water Grid. These are:

- the Cedar Grove Connector, from the proposed Wyaralong water treatment plant to the Southern Regional Water Pipeline
- the Karawatha Inter-connector, from the Southern Regional Water Pipeline to Kuraby in Brisbane.

The pipelines will enhance the operating flexibility of the SEQ Water Grid by allowing water to be transferred from the Logan River system into the Brisbane area, Beaudesert and parts of the Logan City Council area.

The Cedar Grove Connector is expected to be built at the same time as Stage 1 of the Wyaralong water treatment plant, to connect to the SEQ Water Grid. The Karawatha Inter-connector will be built, if required, to improve the operational efficiency of the SEQ Water Grid.

Work is progressing on Hinze Dam Stage 3, which is scheduled to be completed by December 2010. This involves raising the dam wall by 15 metres, which will increase water supply from Hinze Dam by at least 6000 megalitres per year and provide additional flood mitigation for downstream communities.

The Northern Pipeline Inter-connector Stage 2 will provide a two-way connection within the Sunshine Coast. As part of the project, reverse flow capacity will also be installed onto the Stage 1 Inter-connector. The project is scheduled to be completed by the end of 2011.

The Northern Pipeline Inter-connector Stages 1 and 2 will ensure that the same level of security can be provided to the Sunshine Coast as to the rest of SEQ. Without connection to the remainder of the SEQ Water Grid, dams on the Sunshine Coast would remain vulnerable to severe drought. Although usually reliable, these dams are relatively small, with a storage-to-yield ratio of less than half that of the Brisbane River system. As a result, drought response plans for the Sunshine Coast region, as a stand-alone system, would need the ability to be implemented within a relatively short period of time—less than 18 months. By comparison, a desalination facility requires at least three years to construct; although this time might be shortened by pre-planning for a preferred site, it would be unlikely to be shortened by more than about six months.

The Northern Pipeline Inter-connector Stages 1 and 2 will also ensure that adequate supplies are maintained in normal conditions, regardless of the location and timing of the next supply on the Sunshine Coast. Without the pipeline, an additional supply capacity of between 10 000 and 40 000 megalitres per year would have been required for this area by 2026, depending on population growth and the extent to which average consumption remained below pre-drought trends.

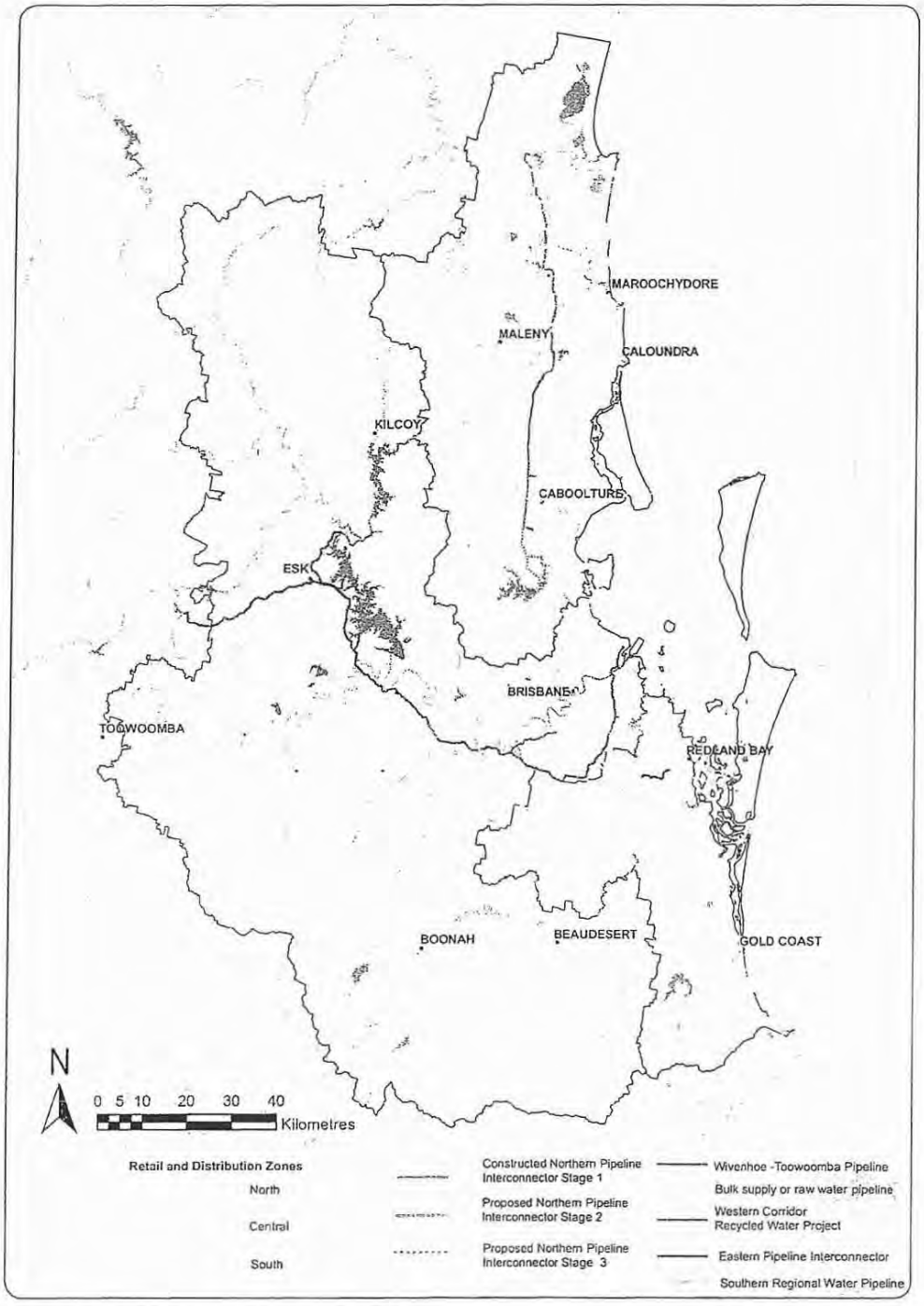
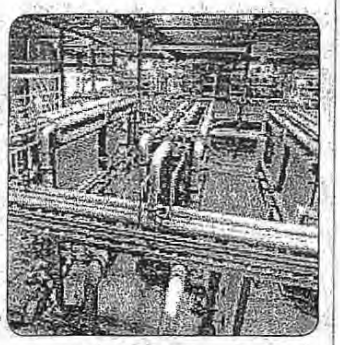


Figure 5.2 SEQ Water Grid interconnections

Major projects

Western Corridor Recycled Water Scheme



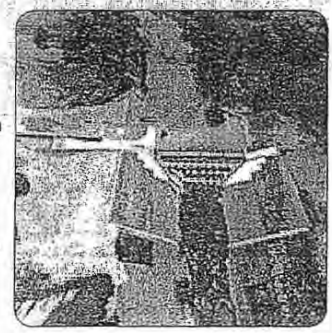
The Western Corridor Recycled Water Scheme is one of the largest purified recycled water schemes in the world. It has the capacity to supply up to 84 680 megalitres per year of high-quality water to power stations and industry, and to replenish Wivenhoe Dam. Water is also available for supply to irrigators in the Lockyer Valley and below Wivenhoe Dam when not required for urban purposes.

The Western Corridor Recycled Water Scheme comprises three advanced water treatment plants at Luggage Point, Gibson Island and Bundamba that treat wastewater from six wastewater treatment plants. The project was completed in 2008.

South East Queensland (Gold Coast) Desalination Facility

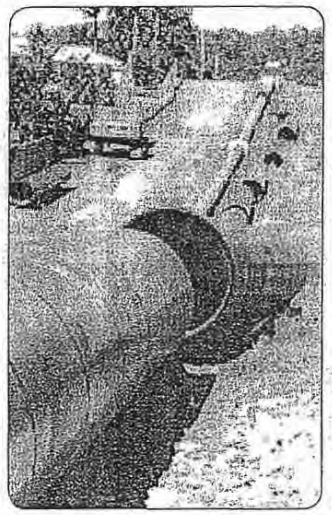
Construction of the SEQ (Gold Coast) Desalination Facility at Tugun was completed in early 2009. The plant has the capacity to supply 46 000 megalitres per year of water into the SEQ Water Grid.

Logan River system



The Cedar Grove Weir and Bromelton Off-stream Storage were completed in December 2007 and July 2008 respectively. The storages are currently releasing water for treatment at South Maclean Weir and supply to areas between Cedar Grove and Logan City.

The Wyaralong Dam is scheduled for completion before the end of 2011. This dam will be operated in conjunction with the Bromelton Off-stream Storage and the Cedar Grove Weir. The three storages are all located in the Logan River catchment. When operated together, the projects will be able to supply more than 30 000 megalitres per year to SEQ.



Interconnections

The SEQ Water Grid is made up of a group of water supply sources connected by a series of large water pipelines.

The key interconnecting pipelines are the:

- the Northern Pipeline Inter-connector between the Sunshine Coast and Brisbane
- the Southern Regional Water Pipeline between the desalination plant at Tugun and Mt Crosby
- the Eastern Pipeline Inter-connector between the Heinemann Road reservoir in Redlands and the Kimberley Park Reservoir in Logan.

The Northern Pipeline Inter-connector Stage 1, Southern Regional Water Pipeline and Eastern Pipeline Inter-connector are all complete and operational. The Northern Pipeline Inter-connector Stage 2 is due for completion in 2011.

The Toowoomba pipeline, between Wivenhoe and Cressbrook Creek dams, became operational in January 2010.

5.3 System yield

The maximum amount of water permitted to be extracted from existing surface and groundwater supplies in SEQ has been established through water resource plans. These plans are implemented through resource operations plans, which have been completed for all SEQ catchments except the Mary River. The resource operations plans specify the operating rules for all dams and weirs. These processes are explained in Chapter 2.

The water resource plans allocate about 530 000 megalitres per year of water from existing major sources of supply for urban use in SEQ. Some 525 000 megalitres per year has been allocated for communities physically attached to the SEQ Water Grid, with the remaining approximately 5000 megalitres per year supplying communities with stand-alone sources of supply. These allocations have differing levels of reliability, and were commonly determined using the Historical No Failure Yield approach without a contingency for drought worse than anything on record.

The Strategy seeks to improve the security of supply in SEQ. One of the means of achieving this has been to apply the LOS approach to assessment of system yield, as described in Chapter 3. By applying the LOS objectives selected for SEQ, less water will be used for urban purposes than is permitted under water resource planning.

The QWC will continue its storage yield investigations, researching the effects of infrastructure operations on evaporative losses, as well as evaluating physical evaporative options.

Operating the SEQ Water Grid

The SEQ Water Grid Manager directs the operation of the SEQ Water Grid, in accordance with the rules described in the SEQ System Operating Plan.

The SEQ System Operating Plan is designed to help achieve the LOS objectives for the region. It guides the SEQ Water Grid Manager in the operation of the SEQ Water Grid. The SEQ System Operating Plan balances the need to maximise water supply security with the need for least-cost operation. It will allow for the take of water from specific sources to vary over time depending on a range of factors, including inflows to dams, operating costs and risk management. The SEQ System Operating Plan is available on the QWC website.

5.3.1 Yield of existing sources and projects currently underway

The LOS system yield will increase from about 485 000 megalitres per year in 2009 to about 525 000 megalitres per year of high priority (Category A) water in 2011, following completion of committed projects. This yield will further increase over time to 545 000 megalitres per year as the Western Corridor Recycled Water Scheme reaches full capacity. Industrial use of purified recycled water will also increase over time.

An additional 32 000 megalitres per year of recycled water is available from the Western Corridor Recycled Water Scheme for rural irrigation (Category B). These Category B supplies will be diverted to Wivenhoe Dam in the event that SEQ Water Grid storage levels decline to 40 per cent of storage capacity. Category B supplies depend on commercial negotiation and could increase over time to about 37 000 megalitres per year, depending on urban demands and increases in wastewater supply to feed the Western Corridor Recycled Water Scheme.

Purified recycled water supplied from the Western Corridor Recycled Water Scheme to the power stations and other industrial users is considered as high priority (Category A) use and is included in the LOS system yield of 545 000 megalitres per year, as these uses would otherwise need to be supplied from other high reliability supplies.

The total combined system yield at 2011 is 553 000 megalitres per year (Categories A and B), increasing to 584 000 megalitres per year over time as the Western Corridor Recycled Water Scheme reaches full capacity.

Depending on the drawdown of sources in the interconnected SEQ Water Grid, there are many alternative scenarios that can achieve the LOS system yield of 545 000 megalitres per year of Category A supplies. Table 5.1 presents an average supply scenario using the existing and committed water sources. It includes the benefit of operating the SEQ Water Grid as a system. The actual amount extracted from any specific source will vary from year to year depending on climate patterns and other influences.

Table 5.1 Supply from existing and committed sources to obtain SEQ LOS system yield

System	Urban allocation (Megalitres per year)[1]	Average contribution to LOS yield (Megalitres per year)	Storage volume (Megalitres)	Minimum operating volumes (Megalitres)
Dams and weirs				
Mary Basin Water Resource Plan area				
Baroon Pocket Dam	36 495	21 900	61 000	4 500
South Maroochy system (Cooloolabin, Wappa, Poona dams)	16 500	7 800	19 470	570
Ewen Maddock Dam	4 315[2]	2 300	16 700	450
Lake Macdonald	3 500	3 300	8 000	800
Borumba Dam	10 144	5 300	46 000	510
Moreton Water Resource Plan area				
Brisbane River system (Wivenhoe, Somerset and Gold Creek dams, Lake Manchester, and Mt Crosby Weir)	285 545	256 300	1 574 650	13 840
Enoggera Dam	1 700	900	4 500	10
North Pine Dam	59 000	33 700	215 000	2 100
Lake Kurwongbah	7 000	3 200	14 370	~ 500
Caboolture Weir	3 600	3 600	1 300	130
Moogerah Dam	890	800	83 700	1200
Toowoomba Pipeline		10 000		
Logan Basin Water Resource Plan area				
Leslie Harrison Dam	7 640[3]	4 300	24 800	2340
Logan River system (Maroon Dam, Cedar Grove Weir, Wyaralong Dam, Bromelton off-stream storage)	19 856 (+ ~ 25 000[4])	36 900	157 140	19 500
Gold Coast Water Resource Plan area				
Hinze Dam	76 300 (+ ~ 7 700[5])	56 300	161 070	2180
Little Nerang Dam			8 400	200
Total dams and weirs	**532 485 (+ ~ 32 700)**	**446 600**	**2 396 100**	**~ 48 830**
Groundwater[6]				
Bribie Island		8 400		
Brisbane aquifers (Algester, Chandler, Forest Lake, Sunnybank, Runcorn)		-[7]		
North Stradbroke Island		9 000		
Total groundwater		17 400		
Manufactured water				
SEQ (Gold Coast) Desalination Facility	46 000	46 000[8]		
Western Corridor Recycled Water Scheme	84 680	35 000[9]		
Total manufactured water	**130 680**	**81 000**		
LOS system yield		545 000		

1 Sourced from existing resource operations plans, interim resource operations licences and preparatory information associated with current operating plan development.

2 When the Mary Basin Resource Operations Plan, is released, it is expected to include a licence for taking water from Addlington Creek for 2900 megalitres per year and a licence to take water from the Mooloolah River for 1415 megalitres per year.

3 Expected volume to be included in the final Logan Basin Resource Operations Plan, based on calculations by SunWater.

4 Bracketed values indicate anticipated allocations to be associated with Wyaralong Dam.

5 Bracketed values indicate anticipated allocations to be associated with the Hinze Dam upgrade.

6 Groundwater entitlements are estimated average water take.

7 The sustainable take of these aquifers is currently being determined. A conservative approach has been taken and the yield has been excluded from the calculation of LOS system yield.

8 The desalination facility also increases the LOS system yield by providing the security to take more water from dams. These increases have been included in the take from dams.

9 Supply for high priority (Category A) uses only, including supply to power stations and industry. In normal operating mode, the Western Corridor Recycled Water Scheme also increases the LOS system yield by providing the security to take more water from dams. These increases have been included in the take from dams.

Table 5.1 also highlights some of the differences between SEQ's dams. Without being connected to the SEQ Water Grid, dynamic smaller coastal storages, such as Baroon Pocket Dam, would be vulnerable to severe drought—particularly as the demand approaches the LOS system yield. These dams have high yield-to-storage volume ratios, meaning that the time available to respond to a water crisis would be short.

Figure 5.3 illustrates LOS system yield over time as the projects currently underway are completed and commissioned. It also illustrates the Category B and combined yield.

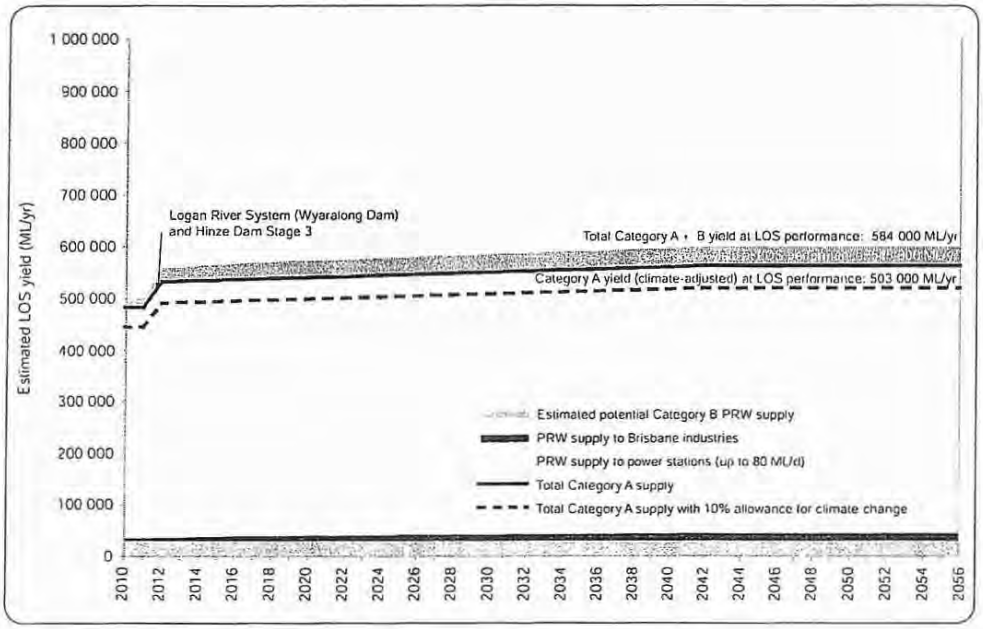


Figure 5.3 System yield of existing and committed infrastructure

Figure 5.4 shows the composition of supplies from the SEQ Water Grid following completion of the committed projects when fully utilised. By comparison, prior to the construction of the SEQ Water Grid, 95 per cent of the region's water supplies were sourced from dams and weirs. The Western Corridor Recycled Water Scheme is included at capacity.

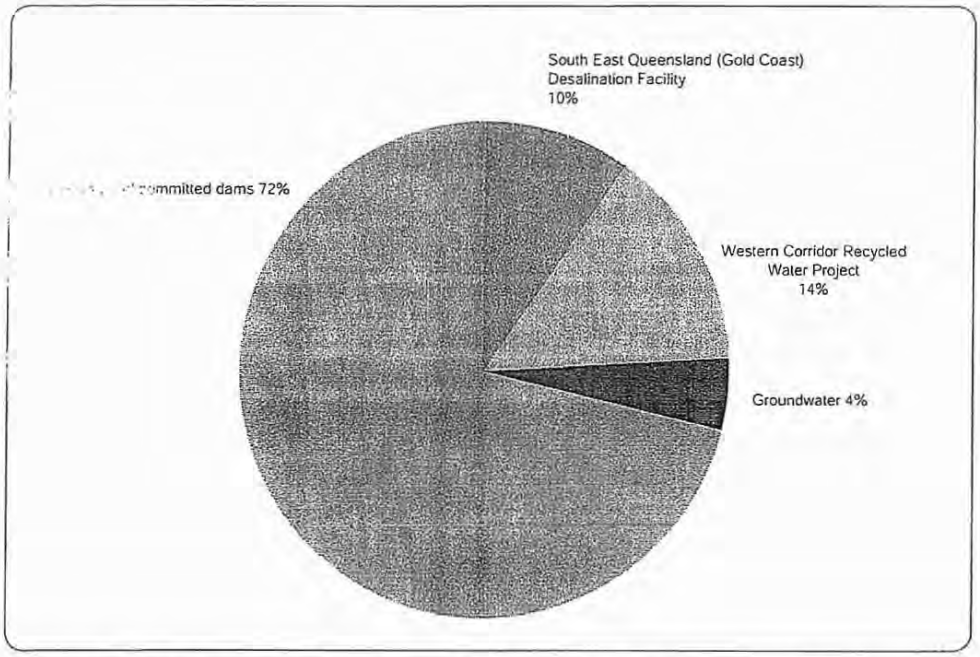


Figure 5.4 Supply distribution from existing and committed infrastructure in 2012

Figure 5.5 illustrates the impact of the LOS system yield on the level of key Water Grid storages using recorded inflows. The analysis is for existing infrastructure and committed projects,where demand equals the LOS system yield and the SEQ Water Grid is operated at capacity. In this scenario, over the past 100 years, restrictions would only have been triggered twice and preparations for constructing new drought-response infrastructure commenced once, as a response to the Millennium Drought. As described in Section 6.1, demand is forecast to equal supply between 2021 and 2033.

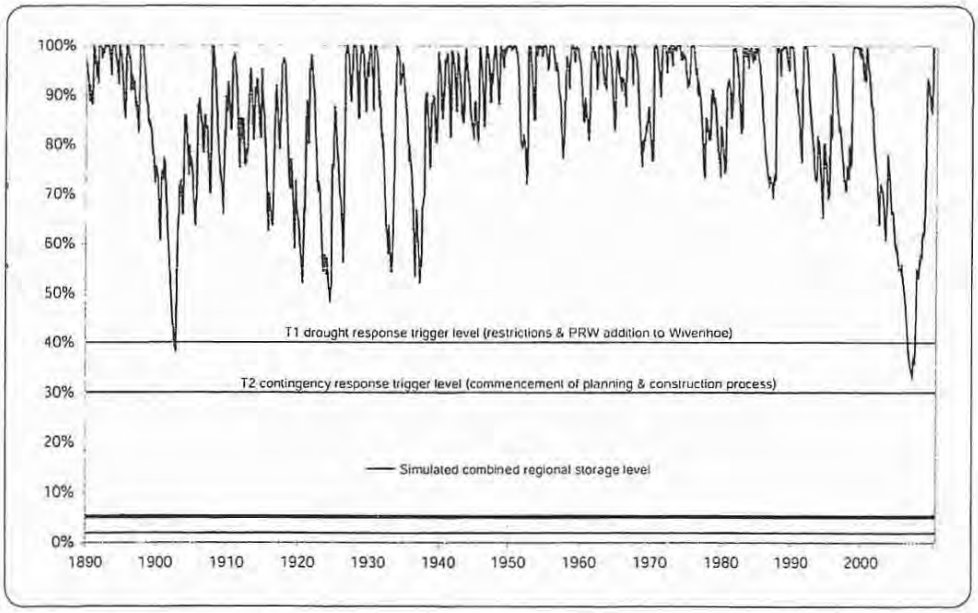


Figure 5.5 Simulated SEQ Water Grid levels based on historic inflows and operation at LOS system yield

Interconnection and diversification benefits of the SEQ Water Grid

An interconnected and diversified SEQ Water Grid increases the LOS system yield above the combined LOS yields of the discrete water supply systems.

Benefits of interconnection

The benefits of interconnection come about because local demands do not need to be met exclusively by local supplies. Likewise, any excess water in a local system can be diverted to supply other areas, rather than be lost as overflow or spill from a dam.

Further benefits can be realised through the cooperative operation of infrastructure that harvests and stores water, and thereby maximises system yield.

Modelling of the regional water balance in two different modes—connected and disconnected—has determined that if the sources of supply existing in 2006 were operated as a connected SEQ Water Grid, there would have been an estimated increase in the system yield of about 14 per cent.

Benefits of diversification

A dam operated in conjunction with a desalination facility or purified recycled water scheme has the potential to yield a greater supply than the same dam operated in isolation.

Desalination facilities and purified recycled water schemes can deliver these benefits as standby facilities—increasing the amount that can be taken from dams when storage levels are high. This mode of operation reduces operating costs and energy consumption.

Purified recycled water will be available to augment Wivenhoe Dam in severe drought, extending the period before drought response infrastructure is needed. The Western Corridor Recycled Water Scheme does not need to be used to augment Wivenhoe Dam at all times, which means that the water can be made available to irrigators on an interruptible basis without affecting the security of supply for urban users.

Without the benefit of the Western Corridor Recycled Water Scheme (WCRWS) introducing purified recycled water into Wivenhoe Dam when the combined key storages fall to 40 per cent of total capacity, the system yield would reduce from 545 000 megalitres per year to about 445 000 megalitres per year (refer to Figure 5.6a).

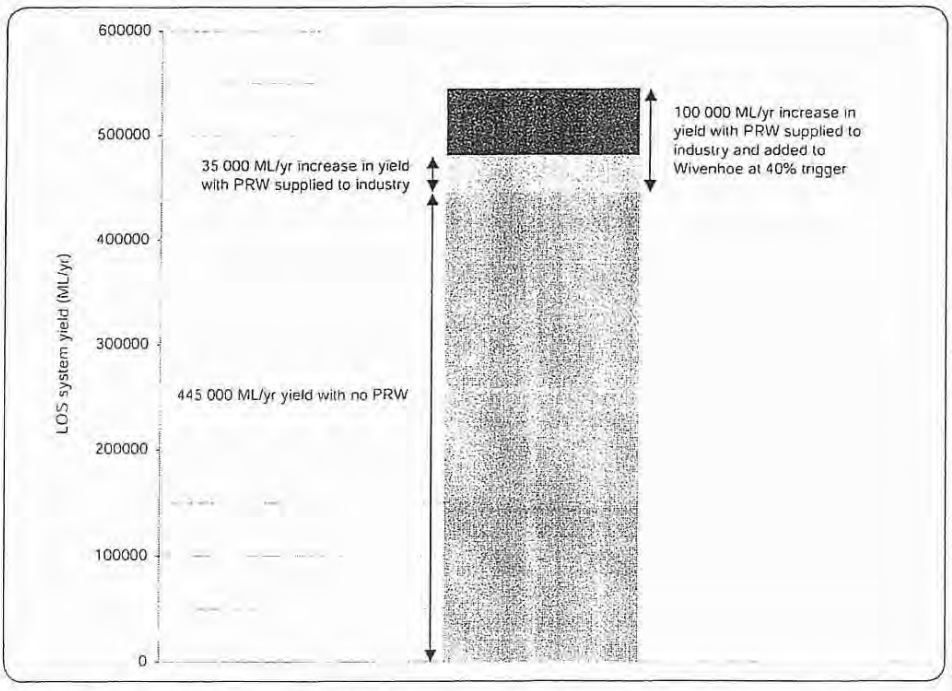


Figure 5.6a Standby value of PRW into Wivenhoe Dam

Using purified recycled water to augment Wivenhoe Dam only when key Water Grid storages fall to 40 per cent of capacity reflects an optimal operating strategy at this time. Using purified recycled water to augment the dam more frequently would have a relatively small impact on the system yield, while significantly increasing our operating costs. It would defer the need for the next major source of supply by up to about 18 months. Figure 5.6 illustrates the impact of varying the trigger level on LOS system yield.

However, when dam levels drop below the 40 per cent trigger point, it is vital that purified recycled water is introduced to Wivenhoe Dam to ensure that LOS is maintained. Figure 5.6b shows that reducing the trigger point would have a relatively significant impact on the LOS system yield.

The impact of varying the trigger depends on the volume of purified recycled water that is supplied directly to power stations, industry and new residential developments, as illustrated in Figure 5.6. The Strategy is based on purified recycled water directly supplying about 35 000 megalitres per year for urban uses including power stations. Higher levels of substitution would increase the LOS system yield and defer augmentation of bulk water supplies.

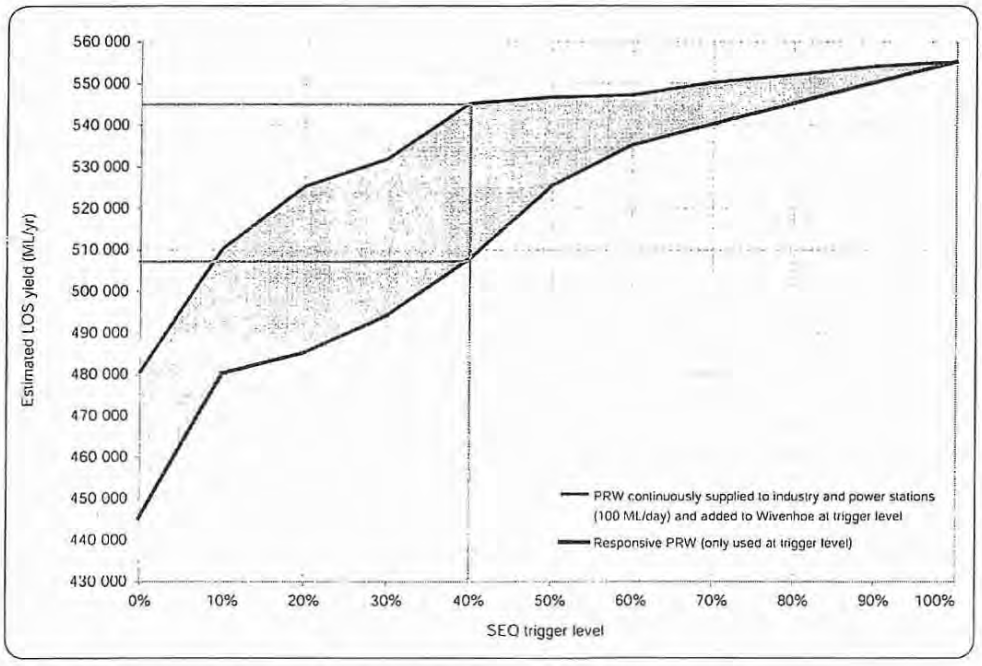


Figure 5.6b Impact of varying the trigger for augmenting Wivenhoe Dam

5.3.2 Potential impacts of climate change

A scenario analysis has been undertaken assuming a 10 per cent reduction in the LOS system yield of surface storages across SEQ due to climate change.

When this climate change scenario is applied, the LOS system yield, including committed infrastructure and the benefits of establishing and operating the SEQ Water Grid, is estimated to reduce from 545 000 megalitres per year to 503 000 megalitres per year. This is shown in Figure 5.3. The system yield in times of drought is discussed in Section 5.3.3.

Case studies have been undertaken for the catchment areas in the western parts of SEQ, as explained in Section 5.3.3. These case studies indicated that changes to annual rainfall could result in annual stream flow for the Brisbane River downstream of Mt Crosby Weir reducing by up to 28 per cent in a dry scenario or increasing by up to 14 per cent in a wet scenario. A preliminary analysis indicates that the upper limit of predicted reduced annual inflows of 28 per cent would result in approximately a 17 per cent reduction in the yield of the system, operating in isolation.

Ongoing work is being undertaken to refine climate impact assessments across the whole of SEQ (refer to Section 3.2). As climate change is unlikely to have a significant impact on supplies in the near future until this work is completed portfolios for new infrastructure will not include climate change impacts

(refer to Section 6.4). However, construction of new infrastructure will be brought forward if evidence of a reduction in yield emerges or if a severe drought triggers the need to construct additional climate resilient or climate independent supplies as part of a drought response plan.

5.3.3 Climate independent and climate resilient supplies

Climate independent and climate resilient water supplies include:

- desalinated water
- recycled water
- the component of inflows to dams that can be relied on under extended and severe drought conditions
- extractions from groundwater aquifers that can be relied on under extended and severe drought conditions.

Producing drinking water from a desalination plant does not depend on the weather. By comparison, producing purified recycled water could be affected by the weather if water restrictions were introduced and access to wastewater was limited. However, at the targeted reduction in demand of 15 per cent in future droughts, Medium Level Restrictions would be highly unlikely to significantly reduce the yield of the Western Corridor Recycled Water Scheme.

Calculating the climate resilient supplies available from dams and aquifers depends on the selection of an appropriate inflow sequence to represent an extended or severe drought. This is discussed in detail in Section 3.1.6. The climate resilient water supplies in the region have been calculated based on the adopted drought inflow sequence. The yields are presented in Table 5.2.

Table 5.2 Climate independent and climate resilient supplies from existing and committed sources

Water supply source	Climate independent and climate resilient yield (Megalitres per year) in severe drought	Indicative contribution to LOS yield (Megalitres per year) in normal times
SEQ surface and groundwater		
• Northern SEQ		89 500
• Central SEQ		268 000
• Southern SEQ		106 500
Subtotal	*220 000*	*464 000*
SEQ (Gold Coast) Desalination Facility	46 000	46 000[1]
Western Corridor Recycled Water Scheme	84 680[2]	35 000[1]
Total	**350 680**	**545 000**

[1] Supply to high priority (Category A) uses. The desalination facility and Western Corridor Recycled Water Scheme also increase the LOS system yield by providing the security to take more water from dams. This benefit has been included in the yield from surface water.

[2] Assumes that sufficient treated effluent will be available to operate at capacity. Treated effluent flows will increase over time due to population growth. Alternatively, flows could be increased by transferring treated effluent from Loganholme to Gibson Island.

Following the completion of the committed projects, climate resilient and climate independent supplies are forecast to increase to about 331 700 megalitres per year in 2012. These supplies will comprise about 63 per cent of LOS system yield at that time. Climate resilient supplies will increase to 350 700 when the Western Corridor Recycled Water Scheme reaches capacity. The volume of available climate resilient yields in the region is critical to the calculation of the drought storage reserve and the T1 and T2 triggers (as described in Section 3.1.6).

The QWC is investigating options to enable the Western Corridor Recycled Water Scheme to operate at capacity should a drought occur in the short to medium term. Options under investigation include:

- diverting additional wastewater into the catchment of the Gibson Island wastewater treatment plant
- transferring treated effluent from the Loganholme wastewater treatment plant to the Gibson Island advanced water treatment plant.

These options would reduce treated effluent discharges to the Logan River, contributing to improved waterway health.

5.4 Potential future water sources

It is important that the best supply options and pipeline routes are preserved now to prevent inappropriate development on or near the sites and to enable a timely and well-informed response to demand growth and future droughts.

The following categories of potential water supply sources have been considered in developing the Strategy:

- desalination
- dams and weirs
- stormwater harvesting to dams
- purified recycled water
- groundwater
- water trading
- supplies outside SEQ.

Rainwater, stormwater and other types of recycling are addressed in Section 4.6, as opportunities to reduce demand for SEQ Water Grid water.

5.4.1 Desalination

Water supply by desalination became part of the SEQ Water Grid in early 2009, when the SEQ (Gold Coast) Desalination Facility commenced operation.

New desalination plants present an option for additional climate independent supplies. Preserving sites where future supply sources might be required is good planning to ensure that we are ready to respond to future droughts that might occur.

How does desalination work?

There are two widely applied and commercially proven desalination technologies—thermal (evaporative) and membrane-based (reverse osmosis). Thermal desalination involves boiling water and condensing the vapour, leaving the impurities behind. Membrane-based desalination involves forcing water at very high pressure through a semi-permeable membrane. Impurities are too large to fit through the pores of the membrane.

Historically, thermal methods have dominated the desalination market. Thermal desalination requires more energy than membrane-based methods, but tends to be more robust. Thermal methods can accept variable feed quality, while reverse osmosis usually requires extensive pre-treatment.

Desalination by reverse osmosis is now the most common process, following recent advances in membrane technology. Reverse osmosis is being used in all major desalination plants in Australia, including at Tugun.

The Queensland Government has announced priority sites for potential future desalination sites in SEQ at Lytton and Marcoola. Table 5.3 lists the site details.

Reserve sites have been identified at Bribie Island and at Tugun. At Tugun, duplication of the facility could be over land currently occupied by a wastewater pumping facility and landfill waste site. Triplication into the sporting fields to the north of the site has been excluded from further investigation. Table 5.3 lists the site details.

Table 5.3 Priority and reserve desalination sites

Category	Site	Property description	Owner
Priority	Lytton	Lot 49 SP193294	State of Queensland
	Marcoola	Lot 753 CG3375	Sunshine Coast Regional Council
Reserve	Tugun (duplication of existing facility)	Lot 30 SP197355	Gold Coast City Council / State of Queensland
	Bribie Island	Lot 67 SP214143	State of Queensland

Alternative sites were investigated at Brisbane Airport and Fisherman Islands. These sites were found to be viable, but are currently not available for development and are therefore not considered to warrant preservation. The current preferred site at the mouth of the Brisbane River would be reviewed, if either of the Brisbane Airport or Fisherman Islands sites becomes available for development prior to significant investment in early works and early construction on the Lytton site.

Technological advances could improve the viability of some sites in the future. Reviews will also take into account population growth and augmentations of the SEQ Water Grid, which might affect where future supplies are required.

Due to environmental considerations the Kawana and North and South Stradbroke Island sites, which were identified in the draft Strategy, have been excluded from any further consideration.

Phase 1 and Phase 2 detailed investigations

Detailed site investigations were undertaken in two phases between 2006 and 2009.

The first phase involved several rounds of investigations by consultants, and identified six potential sites. The QWC considered potential sites along the coastal strip from the New South Wales border to Noosa, including the islands of Moreton Bay and the tidal parts of major rivers, particularly the Brisbane River. Information from previous Gold Coast and Sunshine Coast desalination siting studies was incorporated into the review. The investigations highlighted that opportunities for locating additional desalination facilities in SEQ are limited. The key constraints were the shallow protected areas of Moreton Bay and the extent of urban development and conservation areas along the Sunshine Coast and Gold Coast.

Through consultation on the draft Strategy, additional sites were identified by landholders at:

- Brisbane Airport, on Commonwealth land leased by the Brisbane Airport Corporation
- Fisherman Islands, on Port of Brisbane Corporation land.

The option of expanding the SEQ (Gold Coast) Desalination Facility at Tugun was also considered.

The second phase of investigations was conducted during 2008 and 2009 for the nine potential sites identified in initial investigations and during subsequent consultation. The second phase involved:

- identification of potential environmental and social issues
- engineering pre-feasibility studies to determine the full extent of works required
- preliminary economic assessment of capital and operating costs
- further brine dispersion modelling and mapping of ecologically significant areas in Moreton Bay
- a pre-feasibility study for the expansion of the SEQ (Gold Coast) Desalination Facility
- investigation into potential airport operation issues at the Sunshine Coast Airport.

The priority and reserve sites were selected based on regional water balance considerations and detailed site investigations. In relation to the regional water balance, the sites were selected to:

- potentially accommodate desalination facilities with a combined capacity in excess of 1000 megalitres per day, being the potential supply gap at 2056
- maintain diversity in the location of sites within SEQ.

Phase 1 and 2 reports are available on the QWC website.

Desalination site assessments

The priority and reserve sites are the best available desalination sites in SEQ. A number of issues need to be addressed in further detailed planning for each site.

Northern sub-region

Marcoola is the priority site in northern SEQ. Bribie Island is a reserve site.

The Marcoola site was selected as the priority site in northern SEQ due to lesser environmental impacts, lower costs and fewer construction and operational issues.

Marcoola

The Marcoola site is former cane land, devoid of significant vegetation or permanent structures.

The site is adjacent to the proposed second runway for the Sunshine Coast Airport. Advice indicates that operational issues due to the proximity of the two sites are manageable.

Connecting infrastructure must traverse a strip of Mt Coolum National Park to the east of the site. The impact of construction is likely to be minimised by less invasive construction techniques and thorough site rehabilitation once construction is complete. This matter will be addressed as part of Phase 3 detailed planning.

Bribie Island

Bribie Island is a reserve site. While it is one of the best sites in SEQ, a range of issues would need to be addressed as part of detailed planning.

Bribie Island National Park surrounds most of the land parcel containing the proposed site. To access the sea, pipelines would need to traverse a section of the national park that is also part of the Moreton Bay Marine Park, which is a listed Ramsar Wetland.

The pipelines to transport product water from the desalination facility to the SEQ Water Grid would traverse Pumicestone Passage. The passage is recognised on the directory of important wetlands and is zoned Conservation Park under the Moreton Bay Marine Park. Tunnelling could be required in order to avoid unacceptable impacts, increasing the cost of the project.

Power supply to the Bribie Island site would be more expensive than for Marcoola and traffic would need to be managed during construction, particularly around the bridge.

Central sub-region

In the central sub-region, Lytton is a priority site. This designation might be reviewed if and when the alternatives become available for development. If not already developed, the Lytton site could be immediately released for industrial development. Brine dispersion is a key consideration for all sites at the mouth of the Brisbane River.

Lytton

The Lytton site is currently industrial land. No significant constraints exist on the site that would inhibit the construction of a desalination plant.

Brisbane Airport

The site nominated at the Brisbane Airport could be considered as an alternative to the Lytton site. The site is relatively free from environmental constraints. Subject to airport master planning, it could become available after completion of the parallel runway, which is currently scheduled for 2018.

Fisherman Islands

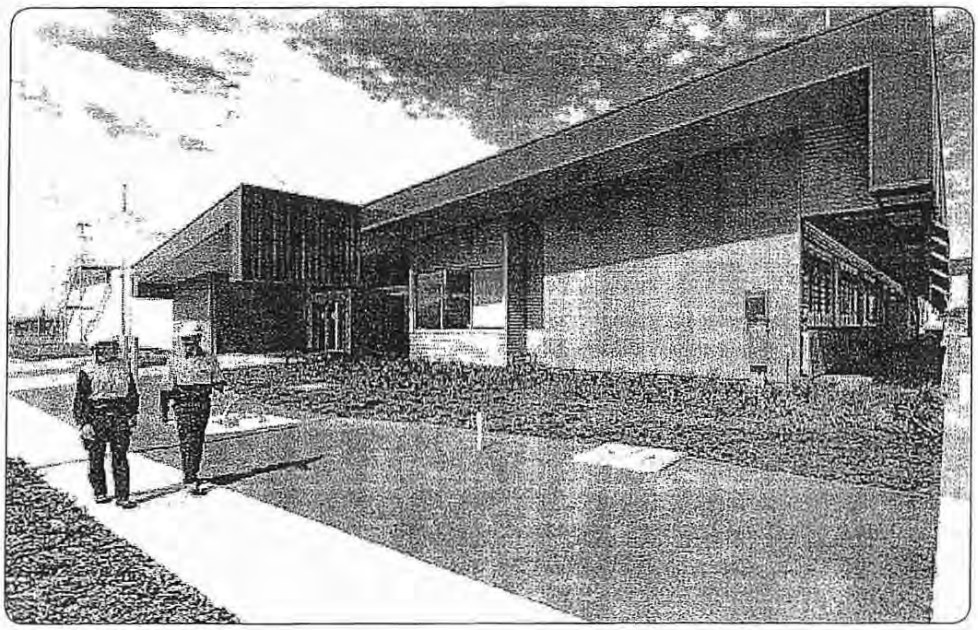
The Fisherman Islands site lies within an operational rail loop at the port. The site is not currently available. In order to develop the site, a planned expansion of the rail loop would need to be completed. Significant ground preparation works would also be required. The Brisbane Airport site is a superior option.

Southern sub-region

No priority sites have been designated in southern SEQ. The reserve site in this sub-region is for a duplication of the existing desalination facility at Tugun.

Duplication of the Tugun desalination facility would involve use of adjoining land occupied by a wastewater pump station, a decommissioned wastewater treatment plant, sporting fields and an active landfill.

Tugun is not a priority site, due to the security of supply in this sub-region with the existing desalination facility and upgrade to Hinze Dam. However, over the long term, demands on the Gold Coast are forecast to exceed existing supplies. Additional capacity at the Tugun site could be used to meet increased local demand, minimising bulk transport costs compared to alternative supplies in other regions.



Future investigations

Detailed investigations of priority sites for desalination have commenced so that they can be delivered whenever required, including as a drought response.

This preparatory phase will culminate in a business case that will recommend the preferred location, size, cost and project delivery mechanism for the facility. The business case is expected to be completed by the end of 2011, for consideration by the Queensland Government.

The business case will recommend a detailed work program for delivering the project when required. Having completed this phase, it could be possible to put the project on hold until about four years prior to when the next facility is required, as guided by the supply and demand balance. Alternative bulk water supplies will also be investigated and, if feasible, might defer the need for additional desalination facilities.

The subsequent phases and key activities are summarised in Table 5.4. This approach will minimise the time and uncertainty involved in construction while providing scope for design innovation at the time that the plant is delivered. In particular, it provides an opportunity for the most recent technologies to be used as part of the detailed design.

Table 5.4 **Planning and delivery of the next desalination facility**

	Activities	Outcome
Preparatory	• Community consultation • Preservation of sites, land use planning • Identification and preservation of connecting corridors • Detailed engineering options analysis, including for water quality and electricity supply • Detailed review of environmental and cultural factors • Confirmation of environmental approvals processes, including through a referral to the Australian Government Department of the Environment, Water, Heritage and the Arts • Identification of potential project delivery mechanism • Refined cost estimates • Business case for delivering the next desalination facility • Detailed work program, including the approvals process	Recommendation regarding preferred location, size, cost and project delivery mechanism for the next desalination facility
Holding	• Ongoing stakeholder consultation and community information • Baseline environmental monitoring • Feedwater characterisation • Ongoing technology scan • Ongoing review of key assumptions	Detailed and up-to-date basis for project procurement and delivery
Procurement	• Community consultation • Securing of funding • Confirmation of project delivery mechanism • Preparation of project scope and specifications • Acquisition of remaining corridors, if required • Tender, assessment and letting	Engagement of a company to deliver the facility
Design and approvals	• Community consultation • Preliminary design • Piloting of plants • Gaining of environmental and other project approvals • Early works	Approval to construct the facility
Construction	• Community information • Detailed design • Construction • Commissioning • Practical completion and project handover • Monitoring of environmental compliance	An operational desalination facility

The preparatory phase will include consideration of whether it is more cost-effective to construct a larger plant at one site, rather than two smaller plants at different locations. In addition, while the structure and connecting pipelines will all be built as one activity, there could be scope for the treatment trains to be installed in stages.

This phase will also include a review of environmental factors for each site, incorporating terrestrial and marine environmental studies. Input from the key stakeholders will be incorporated and cultural heritage issues addressed, as part of this review. Informed by the review, the approvals process required under the *Environmental Protection and Biodiversity Conservation Act 1999* will be confirmed. The approvals process will inform design and approval stages and the terms of reference for an environmental impact assessment.

A project is already underway to investigate the marine communities that exist in the receiving waters, through the SEQ Healthy Waterways Partnership. This project will determine the range of fauna and flora that live on and in the seabed in the vicinity of a brine discharge point. It will also investigate the resilience of these ecosystems to potential elevations in salinity. Detailed field investigations will be carried out.

The SEQ Healthy Waterways Partnership has also started a project with the CSIRO to develop an enhanced receiving water quality model. The enhanced model will be used to assess the impacts of brine discharges in greater detail. A range of other issues identified by the Partnership will also be considered as part of detailed planning.

A full assessment of the cultural heritage value of sites will be carried out for both the plant sites and other land that could be required for pipeline construction. Consultation with relevant Indigenous groups will be carried out where required.

Preparatory works will be undertaken for the Marcoola and Lytton sites only. For the Tugun site, the master plan for the local area is being updated to ensure that the potential use of the site for an expanded desalination facility is taken into account. This planning will be undertaken in partnership with the Gold Coast City Council. No further investigations of the Bribie Island site will be undertaken until the need for the site is defined.

Protecting the health of Moreton Bay

Desalination involves removing salt and other impurities from sea water. The salt is then concentrated into a separate stream of high-salinity water, commonly called brine. The most common way of managing the brine is to mix it back into the ocean where it came from. Sometimes this can present environmental risks for the receiving waters, such as Moreton Bay, which has poor flushing characteristics.

The QWC engaged the SEQ Healthy Waterways Partnership to model brine dispersion for different capacity plants and different discharge locations in Moreton Bay, and to provide advice on how species and communities could be affected by the elevated salt concentrations.

Modelling conducted by the SEQ Healthy Waterways Partnership showed that brine dispersion from a 100-megalitre-per-day capacity desalination plant located at the mouth of the Brisbane River would have 'negligible to low risks' on Moreton Bay marine life, with the impacts being further reduced by placing the discharge further out into the bay.

The SEQ Healthy Waterways Partnership recommended that a discharge site located outside the river mouth towards Mud Island could disperse brine from a plant of 73 000 megalitres per year capacity with 'negligible to low risks'.

Figure 5.7 Example output from hydrodynamic modelling—median salinity contours

5.4.2 Dams and weirs

Additional surface water supplies could be developed through:

- constructing new dams and weirs
- augmenting existing dams and weirs

or

- water harvesting during high flow events into off-stream storages.

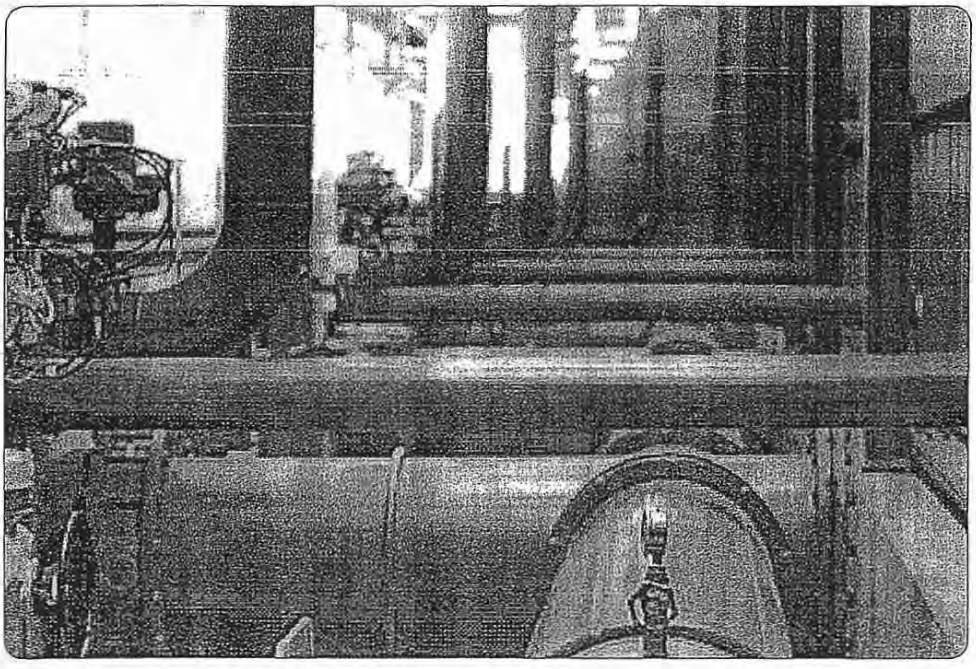
A comprehensive review has highlighted that there are no sound opportunities for developing major new dams in SEQ, beyond committed projects. This is due to the limited availability of additional water for urban use under the water resource plans and the shortage of suitable sites.

Water resource plans specify environmental flow and water allocation security objectives, as described in Section 2.1.3. Through environmental flow objectives, water resource plans for SEQ have already protected a significant portion of surface water flows for the environment.

Water resource plans contain environmental flow objectives at various locations. Table 5.5 specifies the end-of-system flow that must not be jeopardised by future water resource planning decisions in SEQ. This flow is expressed as a percentage of mean annual flow for the area in an undeveloped state. These objectives are a minimum, with actual environmental flows being higher where strategic reserves are not fully allocated for urban or rural use.

Table 5.5 Mean annual flow objectives at river mouth

Water resource plan	Gold Coast	Logan Basin	Mary Basin	Moreton
Location	Mouth of the Nerang River	Mouth of the Logan River	Mouth of the Mary River	Mouth of the Brisbane River
Mean annual flow objective as a proportion of pre-development flows	66 per cent	76 per cent	85 per cent	66 per cent



Mary Basin area

The *Water Resource (Mary Basin) Plan 2006* nominates a strategic reserve of 150 000 megalitres per year as available in the Mary Basin.

The decision of the Commonwealth Minister for the Environment, Heritage and the Arts not to allow the Traveston Crossing Dam project to proceed indicates that it might be challenging to achieve environmental approvals for other water storage projects drawing on this reserve. However, given the limited surface water supply options available to the region, a number of smaller development options will be investigated.

Investigations will be undertaken in partnership with the Department of Environment and Resource Management and in collaboration with Seqwater and the Sunshine Coast and Gympie regional councils. Stakeholder input will be sought in accordance with the proposed project selection process that is outlined in Section 3.5. Options to increase the security and volume of supply to downstream urban and rural users will be considered, including for Gympie.

The options to be investigated include:

- an upgrade to Borumba Dam (Stage 3)
- a weir or pumping pool on the Mary River in the vicinity of Coles Crossing
- one or more off-stream storages
- water harvesting from the Mary River.

Combinations of options will also be considered.

Borumba Dam was raised in 1997 (Stage 2), increasing its storage capacity to 46 000 megalitres. Without water harvesting to the dam, a further (Stage 3) raising to around 350 000 megalitres capacity is considered the upper limit of practical development, taking into account the environmental flow requirements and the probability of filling the dam.

In conjunction with a new weir on the Mary River at Coles Crossing, this raising could provide an additional 20 000 to 30 000 megalitres of water per year. The weir would make available significantly more water than the dam alone, while also providing a pumping pool for extracting water from the Mary River to supply local areas and the SEQ Water Grid.

An off-stream storage could enhance the efficiency of pumping to the dam. Water harvested from the Mary River to the storage could be pumped to the dam over a longer period, reducing the capacity and cost of connecting pumps and pipes. The construction of one or more off-stream storages without pumping to the dam will also be investigated as an option to reduce cost and energy requirements. The off-stream storages could be excavated to below river level and be gravity-fed from the river, or be constructed at a higher level with pumping from the river to the storage.

In addition, the QWC will also investigate options to operate the SEQ Water Grid to provide local benefits. For example, when supply for SEQ exceeds demand, Noosa could be supplied from the Northern Pipeline Interconnector Stage 2 rather than from Borumba Dam. This would enable the SEQ Water Grid Manager to make additional water available from Borumba Dam for local purchase and use, subject to appropriate conditions. This could defer the need for additional supplies in the Mary Basin.

Similarly, should one of the smaller options be viable, the QWC will investigate options to integrate water treatment for the SEQ Water Grid with water treatment for Gympie and other local areas.

The QWC will not investigate further options to raise Borumba Dam to make available 70 000 megalitres per year at a similar level of reliability to Traveston Crossing Dam. A 2007 consultancy report, undertaken as part of the Strategy investigations, estimated that the capital cost of such a scheme was in the order of $3 billion. The scheme would also have high ongoing pumping costs.

Other potential dam options have also been excluded from further consideration, including the construction of dams on:

- Amamoor Creek
- Obi Obi Creek at Kidaman
- Mary River near Cambroon.

The options of future storages on the Mary River (Cambroon) and Obi Obi Creek (Kidaman) were excluded by the Queensland Government from further consideration in a 1994 study due to the high cost and significant environmental and social impacts. The dam on Amamoor Creek would also have significant environmental impacts.

Logan Basin area

In the Logan Basin area, there is still potential for up to around 14 000 megalitres per year of high priority water allocation beyond the allocations for committed projects.

A number of options to make additional water available will be investigated, including:

- raising Cedar Grove Weir
- constructing a raw water pipeline to transfer water from the Bromelton Off-stream Storage to Wyaralong Dam
- constructing a weir on the Albert River, immediately downstream of the proposed Wolffdene Dam site
- constructing an off-stream storage adjacent to the Albert river in the vicinity of the existing Luscombe Weir
- constructing a small on-stream or off-stream storage, in the vicinity of the proposed Glendower Dam site on the Albert River.

Moreton area

In the Moreton Water Resource Plan area, an estimated 25 000 megalitres per year of strategic reserve is available.

The introduction of drought storage reserves has reduced the working volume of dams. This, in turn, has reduced the yield from the storage. In these cases, the reduction can be partially offset by increasing the working storage of the dam. The increase in working storage can be achieved by several methods, including raising the dam wall or modifying the operating rules that balance water storage capacity and flood mitigation capacity. Downstream flood impacts will be a key consideration in investigations into any of these options.

A detailed investigation will be conducted to determine the maximum level to which the working storage of Wivenhoe Dam could be raised without raising the dam wall. The investigation will be carried out in conjunction with Seqwater and the Brisbane and Ipswich City Councils. It will include detailed consideration of:

- the impact on frequency, severity and duration of flooding both upstream and downstream of the dam
- any effect on the structural integrity of the dam and its components or any required spillway upgrades
- environmental and social impacts, including adverse affects on any roads and crossings caused by flooding.

Hydrological investigations will be carried out to determine the increased security of supply or the additional volume of water that could be made available to the SEQ Water Grid while still remaining within the requirements of the water resource plan.

Some of the reserve could be accessed by raising the Mt Crosby Weir. Another possibility is as an additional extraction from Wivenhoe Dam. Some of the reserve might also be accessed in other smaller river systems.

Gold Coast area

In the Gold Coast Water Resource Plan area, an estimated 30 000 megalitres per year of additional high priority water allocation may be made available through the construction of additional infrastructure.

Around 7700 megalitres per year of this will become available through the raising of the wall of Hinze Dam. There is some potential to water harvest from Gold Coast creeks and the Coomera River into Hinze Dam.

5.4.3 Stormwater harvesting to dams

The QWC will investigate opportunities to use stormwater to augment inflows to dams, to improve system yield and benefit the local environment.

Sunshine Coast Water has undertaken preliminary investigations into a scheme for collecting stormwater from the Caloundra South development area to augment Ewen Maddock Dam. The scheme could double the catchment area of the dam, increasing the volume and reliability of supply. It would also reduce stormwater discharges from the development area.

The proposed scheme is likely to be the most feasible in SEQ, because:

- the dam is located only 7 kilometres from the potential development area, meaning that the transfer pipeline would be relatively short

- the dam is at a relatively low height above the potential development area, meaning that the energy required to pump stormwater up to the dam is relatively small
- the dam supplies an advanced water treatment plant with surplus capacity, meaning that upgrades are unlikely to be required
- it is a new development area, meaning that it can be designed around the proposed stormwater harvesting scheme.

A range of issues will need to be investigated before the scheme proceeds, including water quality risks, environmental flow benefits, impacts on the ecology of the dam, and economic viability. The benefits of water-sensitive urban design in removing contaminants of concern will also be considered. The QWC will further investigate the proposal, as part of the proposed sub-regional total water cycle management plan for the area. Investigations will be undertaken in partnership with Seqwater, Unitywater and the Sunshine Coast Regional Council.

Local rainwater and stormwater harvesting are addressed in Section 4.6, as opportunities to reduce demand for SEQ Water Grid water. This includes proposed research projects at Coolum and Fitzgibbon to harvest roofwater for treatment and introduction to water distribution systems.

5.4.4 Purified recycled water

Purified recycled water is wastewater that has been treated to drinking water quality using the best available technology. This high-quality water can be delivered directly to end-users, such as power stations or industries, or used to augment a dam or aquifer. If purified recycled water is added to a dam, natural processes provide an additional environmental and time buffer before treatment of the blended water at the existing water treatment plant and distribution to consumers. More information about the treatment process, including an explanatory video, is available on the QWC website.

The water is subject to water quality monitoring and testing at all stages of this process. In Queensland, purified recycled water must meet health and safety requirements contained in the *Water Supply (Safety and Reliability) Act 2008* and the Public Health Regulation 2005.

Purified recycled water has many benefits:

- Purified recycled water is highly climate resilient. Weather is unlikely to significantly affect the availability of purified recycled water. At the targeted reduction in demand of 15 per cent in future droughts, Medium Level Restrictions would be highly unlikely to significantly reduce the volume of wastewater produced and therefore would not significantly reduce the yield of purified recycled water schemes.
- The treatment process removes about 50 per cent of phosphorus that otherwise would have been released into waterways, rivers and Moreton Bay. Phosphorus from existing wastewater treatment plants is one of the key causes of algal blooms in the Brisbane River and Moreton Bay.
- Energy requirements for purified recycled water are less than for seawater desalination. The pressure required to operate reverse osmosis units is approximately proportional to the salinity of the water being treated. Seawater commonly has a salinity of over 30 times that of treated wastewater, resulting in substantially higher energy requirements. Energy consumption is further discussed in Section 6.8.

Interim Water Quality Report

In February 2009, an *Interim Water Quality Report* on purified recycled water from the Bundamba advanced water treatment plant was published. The report contains the results of more than 8000 tests undertaken during the validation testing program for the plant.

The QWC also published a review from the Expert Advisory Panel, which states that the commissioning of the Western Corridor Recycled Water Scheme is proceeding well, demonstrating that it is capable of consistently producing purified recycled water that is safe to be used to augment Wivenhoe Dam.

Western Corridor Recycled Water Scheme

The Western Corridor Recycled Water Scheme is one of the largest purified recycled water schemes in the world. It has the capacity to supply up to 84 680 megalitres per year of recycled water to industry and power stations and for replenishing Wivenhoe Dam.

Up to 32 000 megalitres per year of recycled water will be available for rural production in the Lockyer Valley and along the middle reaches of the Brisbane River when not required to supplement Wivenhoe Dam. Subject to urban demands, the amount available for supply to irrigators mgiht increase to 37 000 megalitres per year over time as feed water flows to the project increase.

The Western Corridor Recycled Water Scheme will maintain a high level of water quality in preparedness for augmenting water supply as necessary.

An expert advisory panel of world leaders in toxicology, environmental science, microbiology and advanced water treatment provide independent advice on the regulatory framework for purified recycled water and the Western Corridor Recycled Water Scheme. There are nine members on the Panel, which is chaired by Professor Paul Greenfield, AO (Vice-Chancellor, The University of Queensland). More information about the panel is available on the QWC website.

Industrial use of purified recycled water

A number of industrial customers have expressed interest in receiving purified recycled water. The process to receive this water involves negotiations between the industrial customer and the retailer, who negotiates with the SEQ Water Grid Manager for supply and delivery of the purified recycled water to the customer.

The uptake of purified recycled water by current industrial customers is limited by a number of factors:

- Many large industrial users are already using recycled water, including the BP and Caltex refineries.
- The supply of purified recycled water requires dedicated infrastructure, including pipelines to individual customers, pumps, valves and meters, which adds to its cost.
- Many high-volume industrial water users are not situated within a reasonable vicinity of the pipeline that delivers purified recycled water from the Western Corridor Recycled Water Scheme.
- As businesses have established water efficiency management plans (WEMPs), they have already reduced their water consumption.

Over time, there is potential for the supply of purified recycled water via dual reticulation to a number of proposed industrial parks located within reasonable proximity of the Western Corridor Recycled Water Scheme. Planning for supply to industrial areas will focus on locations where one or more large foundation customers can be established to provide an anchor for new recycled water schemes.

Other potential schemes

Increased community confidence in purified recycled water schemes could permit the development of additional schemes and the greater utilisation of the Western Corridor Recycled Water Scheme. The QWC considers that it is prudent to proceed with investigations of these potential schemes, with a view to preserving land for treatment facilities and pipeline corridors if viable.

Two potential purified recycled water schemes have been identified as possible future sources of supply, or as part of the response to a severe drought:

- augmentation of supply to North Pine Dam using purified recycled water produced from the Sandgate wastewater treatment plant and wastewater treatment plants in the Moreton Bay Regional Council area
- augmentation of supply to Hinze Dam using purified recycled water produced from one or more of the Coombabah, Elanora and Merrimac wastewater treatment plants at the Gold Coast.

These additional schemes have the potential to increase the available supply, in total, by about 60 000 megalitres per year by 2056.

The assessment of potential schemes took into account wastewater availability, future water demands, capital and operating costs, options for concentrate disposal, and the potential level of dilution and detention in dams.

Local governments and distributor-retailers should consider alternative uses for any treated wastewater effluent, except that required to feed the Western Corridor Recycled Water Scheme, especially where improvements to the health of receiving waterways can be achieved.

5.4.5 Groundwater

Groundwater resources in SEQ are almost fully developed. The annual volume of groundwater used for urban purposes over the next 50 years is expected to remain largely static. The use of groundwater for rural production is also considered fully developed and, in some cases, over-developed.

Groundwater sources have been developed at Bribie Island and at several aquifers in greater Brisbane. These projects were initiated in 2006 as part of the drought response and are now supplying water to the SEQ Water Grid. The sustainable yield of the Brisbane aquifers is currently being determined.

At this stage, development of any additional groundwater supplies will not be pursued. The identified opportunities within and adjacent to SEQ are generally small and not considered to be economically viable as a regional resource. These opportunities include:

- the offshore sand dune islands, including North and South Stradbroke, Moreton, Bribie and Fraser islands
- localised, onshore sand dune deposits near to the coastline and extending intermittently from Rainbow Beach in the north to the Gold Coast in the south
- an extensive system of mostly fractured volcanic rocks associated with what is known geologically as the Gympie Province, extending from just north of Nambour to Gympie
- sedimentary deposits, mostly sandstones associated with the southern part of the Maryborough Basin and known locally as the Myrtle Creek Sandstone
- limited outcrops of relatively young tertiary basalts in the Maleny, Buderim, Sunnybank, Redland Bay and Tamborine Mountain areas
- reasonably extensive tertiary sedimentary deposits outcropping in the Brisbane metropolitan area to the north and south of the city.

Several of these aquifers were investigated as part of the Millennium Drought. Drilling in the extensive sedimentary deposits associated with the Nambour Basin—extending from north of Maroochydore inland to Maleny and southwards to Caboolture—revealed that the available groundwater supplies are small and do not warrant development as an urban supply.

Of the remaining opportunities, the most significant are the Moreton Island and the Cooloola–Teewah sand masses. These aquifers have not been considered as normal supply options because of their location within national parks and the relatively small quantities that could be extracted without unacceptable environmental impacts.

Increased extraction from the aquifer on North Stradbroke Island was considered as part of the response to the Millennium Drought. The project was not progressed due to the risk of long-term impacts on the sensitive environment of the island. A detailed investigation was undertaken, with potential impacts on Blue Lake and other groundwater dependent ecosystems considered.

Separately, the *Water Resource (Moreton Basin) Plan 2007* has established groundwater management areas in Cressbrook Creek, the Lockyer Valley and the Warrill–Bremer Valley. These management areas are expected to reduce the rate of groundwater extractions to more sustainable levels with the aim of protecting water quality and ecosystem health.

The use of aquifers as storage for recycled water is under consideration as part of the Urban Water Security Research Alliance project, building on earlier work by the CSIRO. Preliminary indications are that a limited number of sites around Brisbane could be developed for stormwater harvesting and aquifer storage. A specific application of aquifer storage and recovery is under investigation on the Gold Coast to store recycled water for irrigation purposes.

5.4.6 Water trading between rural and urban allocations

Water resource plans provide a framework for water trading between water users, as explained in Section 2.1.3. In some cases, this framework can provide for the conversion of medium priority to high priority water allocations, and potentially vice-versa.

For SEQ, converting medium priority water for rural production to high priority water for urban supply is not considered to be a viable alternative for augmenting urban water supplies. In general, rural water allocations are small compared to existing urban demand. With conversion from medium priority to high priority, the volumes would be significantly smaller. Measures to increase the availability of water for rural production are explained in Chapter 6. In the right environment, there could be some small trading opportunities with willing sellers and purchasers of water allocations.

5.4.7 Supplies from outside SEQ

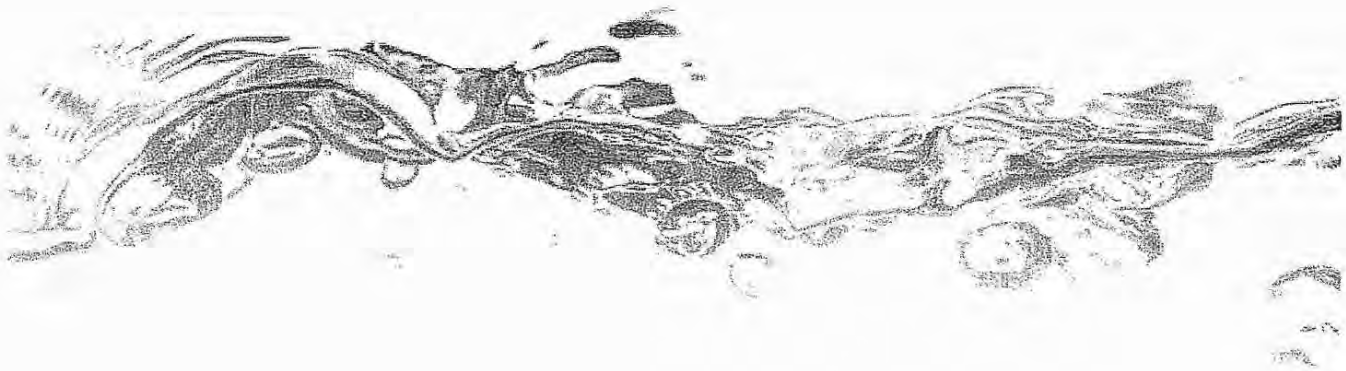
There are opportunities to import water into SEQ from outside the region.

Investigations were completed in October 2007 into a direct pipeline connection between the Burdekin Basin and SEQ. The capital cost estimates for the project were found to be prohibitive at that time. Operating such a scheme would also exceed the total energy cost of a desalination plant. The completed report is available on the Department of Environment and Resource Management website.

Consideration has also been given to supplies from north-eastern NSW, such as the Tweed, Brunswick, Clarence, Richmond and Wilson river catchments. Bulk water supply opportunities were investigated, but were found to be costly compared to committed SEQ projects and to have numerous social and environmental issues.

5.4.8 Supplies from coal seam gas developments

Water extracted as a by-product of coal seam gas developments in the Surat Basin could be a future water supply source for SEQ. Before coal seam gas water is considered for SEQ the highest and best local uses should first be investigated. The supply of coal seam gas water to SEQ for potable use must meet strict water quality regulations. In addition, the supply would be at no cost to the SEQ Water Grid, at least until further water supplies are required.



Chapter 6

The Strategy

This chapter outlines a comprehensive strategy to ensure that SEQ never runs out of water. It describes the water supply and demand management initiatives required to meet the needs of regional growth and provide security of supply during drought.

Key messages

- The Strategy aims to deliver sufficient water to support a comfortable, sustainable and prosperous lifestyle while meeting the needs of urban, industrial and rural growth and the environment.
- Water supply for SEQ is now secure. There is a less than 1 per cent probability of key SEQ Water Grid storages falling to 40 per cent of combined capacity over the next five years, triggering the reintroduction of Medium Level Restrictions.
- The Strategy is sufficiently robust to accommodate uncertainty regarding population growth, lifestyle expectations and climate.
- Demand for water will be managed by continuing to improve structural and operational water efficiency and continuing to encourage efficient water use.
- The Strategy challenges residents to maintain average consumption at or below 200 litres per person per day (Target 200).
- If this target is achieved, new supplies will not be required until around 2027. New supplies could be required from 2021, should the target not be achieved.
- Over time, climate change could reduce the yield of our dams, potentially bringing forward the time at which new supplies are required. The QWC will continue to research the impacts of climate change, in partnership with the CSIRO and local universities.
- Demand management is forecast to almost halve energy consumption for the SEQ Water Grid at 2050, compared to pre-drought trends.
- Local supplies are forecast to reduce demand on the SEQ Water Grid by about 35 000 megalitres per year in 2026 and about 60 000 megalitres per year in 2056.
- The QWC will review the Strategy before providing advice about the next major water supply. Potential supplies will be assessed through a robust and transparent process.
- Additional desalination facilities will underpin future water security. Detailed planning for facilities at Marcoola and Lytton has commenced.
- A range of other options is being investigated that could reduce and defer the need for additional desalination facilities.
- Drought response plans will be prepared for rural towns and for the SEQ Water Grid as a whole.
- 32 000 megalitres per year of recycled water has been made available for rural production.

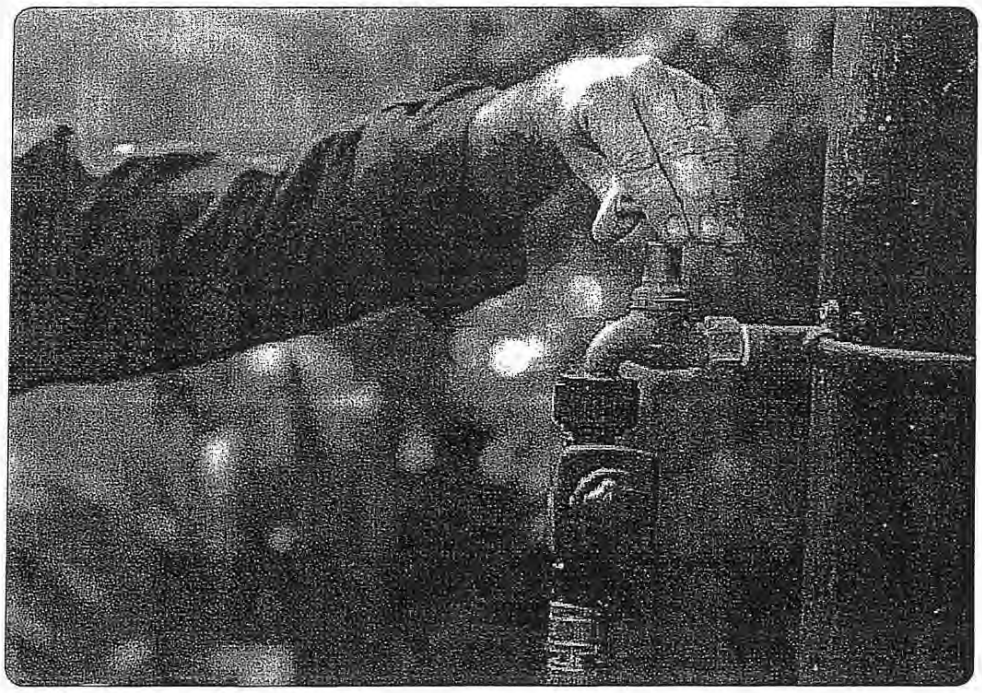
The main purpose of the Strategy is to achieve the LOS objectives. Critical to achieving this outcome is to ensure that water is used efficiently and available supplies always exceed demand.

Many elements of the Strategy are already being implemented. Critical planning elements must be finalised in order to ensure that we are ready to respond to the effects of population growth, consumption trends and climate change.

This chapter applies the planning methodology outlined in Chapter 3 to:

- quantify the potential future supply gap in normal operating mode (refer to Section 6.1)
- identify additional demand management measures (refer to Section 6.3)
- identify a preferred infrastructure program, pending the outcomes of detailed investigations of potential sources of supply (refer to Section 6.4)
- establish drought response plan requirements (refer to Section 6.9).

In addition, the chapter specifically addresses water supplies for rural communities and rural production, water quality, research and development, and energy and greenhouse gas emission implications of the Strategy.



6.1 Water balance

Water supply for SEQ is secure for the short to medium term, due to the SEQ Water Grid being constructed and key Water Grid storages being full or nearly full.

The next major supply will be triggered by demand increasing to the point that it exceeds the LOS system yield or by drought causing dam levels to fall to 30 per cent of capacity.

The next supply is likely to be triggered by demand growth, due to key Water Grid storages being full or almost full. A major new supply might be required in 2021, beyond the completion of projects currently underway. This forecast is based on:

- average total consumption of 375 litres per person per day
- high series population growth.

However, it is more likely that a major new supply will not be required until mid-2020s. For example, a new supply would not be required until around 2026 with:

- average total consumption of 375 litres per person per day
- medium series population growth.

Figure 6.1 presents a scenario for the water balance for Category A supplies to 2056, based on existing infrastructure and projects currently underway, and with demand forecasts based on medium and high series population forecasts.

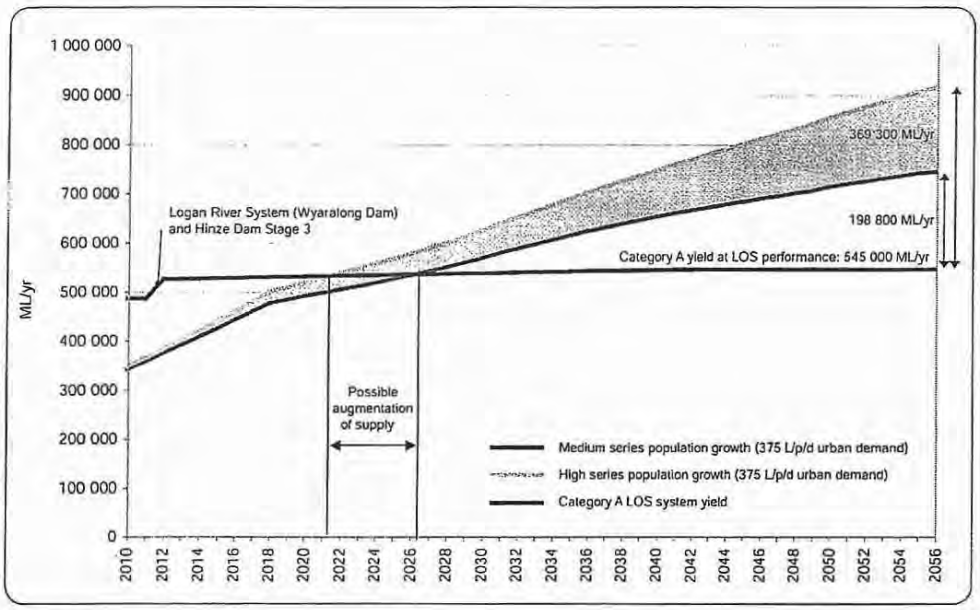


Figure 6.1 Category A water balance in normal operating mode

Figure 6.1 illustrates approximately when supply gaps could occur in the future. A supply gap occurs when demand is greater than the LOS system yield. The potential supply gap depends on the assumptions made regarding the demand for water and the effects of climate change.

As explained in Section 3.2, detailed analysis of the potential impacts of climate change on SEQ water supplies is being undertaken by the Queensland Government Climate Change Centre of Excellence and the CSIRO, through the SEQ Urban Water Security Research Alliance. Until this work is completed, a mid-range climate change scenario of 10 per cent reduction in surface water availability by 2030 has been adopted. In contrast to Perth, these changes are expected to occur over the medium to long term. However, should there be an immediate 10 per cent reduction, the earliest date for supply augmentation would move forward from about 2022 to about 2017. While this scenario is considered unlikely, it is prudent that we continue to plan to be prepared to respond as required.

Having a supply gap does not mean that water supplies will be completely depleted. A supply gap results in an increased likelihood that LOS objectives cannot be met and a greater chance of water restrictions being imposed.

Where supply equals demand, indicated where the demand and system yield lines intersect, the likelihood of entering restrictions is one in 25 years on average. When the system is in surplus, there is a reduced likelihood of entering restrictions, depending on how the SEQ Water Grid is operated.

In accordance with the LOS objectives, the Strategy plans to make sufficient Water Grid water available to meet an average regional urban demand of 375 litres per person per day. As explained in Chapter 4, this is a conservative assumption, and a prudent approach for water supply planning. It takes into account the timeframes for delivering bulk water supply infrastructure, and the level of uncertainty regarding the extent of permanent behavioural changes by the community, population growth, climate variability and the potential impacts of climate change.

6.2 Target 200

The Strategy seeks to build a long-term water savings culture in the SEQ community. It sets a voluntary regional residential consumption target of 200 litres per person per day (Target 200). This challenge is separate from restrictions and will be actively encouraged but not enforced.

The QWC considers that this target can be achieved without significantly changing the lifestyle we enjoy, including the ability to sustain healthy, water-wise gardens. By doing so, the need for additional supplies and the amount of water that is treated and distributed through the SEQ Water Grid can be reduced and deferred, saving money and electricity.

Figure 6.2 shows that reducing average regional consumption by 30 litres per person per day to 345 litres per person per day would defer the need for additional supply beyond projects currently underway from 2026 to around 2033 with medium series population growth and no allowance for climate change.

It would also reduce the supply gap at 2056 by at least 65 700 megalitres per year—equivalent to the Grid water used by about 300 000 houses.

Usage of 345 litres per person per day is equal to the saving that will be achieved if residents of SEQ maintain average regional residential consumption at or below 200 litres per person per day (Target 200). However, changes in the demand profiles can occur for many other reasons.

The sensitivity assessment assumes no adjustments to the LOS objectives relating to the frequency, severity and duration of restrictions and to the frequency of triggering a drought response plan. If the planning assumption for average regional consumption were to be reduced, it would be necessary to consider the impact on effectiveness of future restrictions.

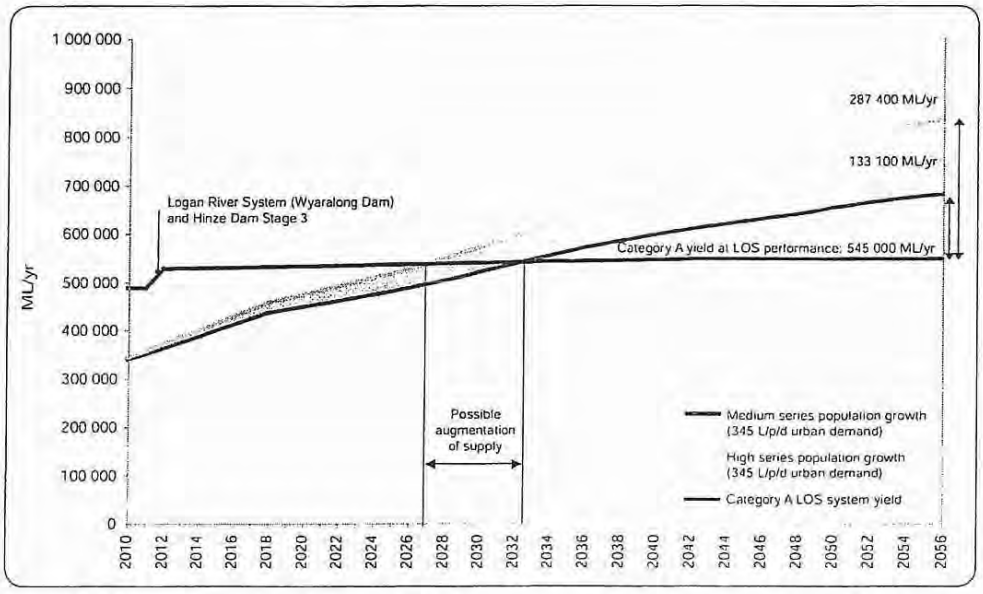


Figure 6.2 Impact of reducing average total consumption by 30 litres per person per day

At the same time, for the reasons outlined in Section 4.3, the QWC recognises that there could be a rebound in water use that might make the consumption target challenging to achieve.

In setting the target, the QWC recognises that actual residential consumption will vary considerably between households and across SEQ due to the type and age of homes, number of occupants, location in terms of climate, soil type conditions and the size and type of gardens. Small households in dry locations might use more, but households in new houses should aim to use less. Actual residential consumption will also vary between seasons and years.

The consumption target will be a key element of an ongoing low level education and communications program. This program will provide timely, well-targeted information and will seek to reinforce some of the basic behavioural changes that enabled residents of SEQ to reduce average demand to below 140 litres per person per day during the Millennium Drought, and to support structural and operational water efficiency measures. The program will include ongoing reporting on achievement of Target 200, with a focus on the long-term benefits of maintaining average regional consumption below 200 litres per person per day.

The collective benefits of these types of behavioural changes can be dramatic, as demonstrated by the success of the Target 140 residential campaign. Once the Target 140 campaign commenced, average residential consumption in central SEQ dropped to below 140 litres per person per day within six weeks and remained below 140 litres per person per day for the year from July 2007 to July 2008. This was a significant drop from the 300 litres per person per day used in 2004–05.

Support for Target 200

Across SEQ, average residential consumption was 165 litres per person per day over six months from 1 December 2009, when Permanent Water Conservation Measures commenced. In central SEQ, average consumption has remained at 148 litres per person per day. Consumption has also:

- remained low on the Gold Coast, where residents were exempted from restrictions from 8 January 2009 until the commencement of Permanent Water Conservation Measures, with average residential consumption of 206 litres per person per day
- reduced on the Sunshine Coast, which has not previously been subject to QWC water restrictions, with average residential consumption of 224 litres per person per day.

These trends reflect the results of a 1000 respondent online survey undertaken from 3 to 8 March 2010, during which combined dam levels rose from 82.3 to 95.8 per cent of capacity. In particular:

- 74 per cent of respondents were either very comfortable or comfortable with 200 litres per person per day as a permanent usage target
- 42 per cent of respondents indicated that we should preserve water and hold people to usage levels similar to those we have now (200 litres per person per day). Nearly a third (29 per cent) of respondents indicated that the target should not go far above 200 litres per person per day.

6.3 Demand management program

The Strategy aims to build on the successful demand management programs that commenced during the Millennium Drought. Existing measures that will be continued are described in Section 4.4 and summarised below. New structural, operational and behavioural elements of this program are described below. Consistent with Section 4.4, demand management measures have been categorised as:

- structural—making sure our homes and businesses have water-efficient devices, appliances and equipment installed
- operational—making sure that water-efficient equipment is used correctly to achieve efficient outcomes
- behavioural—encouraging good water use behaviours and ensuring that the community understands the benefits of conserving water.

The continuing and proposed water savings measures are generally cost-effective compared to new sources of supply and can be achieved without significant changes to lifestyle. Chapter 4 explains the basis for the savings and the impacts for residents.

Continuing water use efficiency measures

A range of water use efficiency measures that were implemented during the drought will continue long term. These measures include:

- public education and communication programs
- requirements for alternative local water sources, such as internally connected rainwater tanks, to be installed in most new buildings
- requirements for water-efficient fittings and fixtures to be installed in new and renovated commercial, industrial and residential buildings
- requirements for businesses using more than 10 megalitres per year to prepare a water efficiency management plan that demonstrates how they will move towards best practice water use efficiency
- requirements for all businesses to ensure that their urinals and cooling towers are efficient
- requirements for businesses using 1 megalitre per year or more to ensure that all internal water fittings on the premises are water-efficient
- requirements for sub-meters to be installed in new residential and commercial multi-unit developments
- provision of water use information to residential tenants, in accordance with guidelines issued by the QWC
- ability for landlords to pass on water consumption charges to tenants of individually metered and water-efficient premises.

6.3.1 Water restrictions

Water restrictions will continue to be part of the demand management program.

Permanent Water Conservation Measures were introduced across SEQ on 1 December 2009. Under these measures, time restrictions have generally been relaxed, but efficiency measures remain in place.

The QWC will continue to review the role of water restrictions as part of the overall demand management program. In doing so, the QWC will seek to ensure that it achieves an appropriate balance between water restrictions and other demand management measures, with the objective of encouraging water efficiency at the lowest possible economic, social and environmental costs.

The QWC will also develop future Medium Level Restrictions as part of the drought response plan. These restrictions will be designed to achieve the LOS objective of reducing average regional consumption of 375 litres per person per day by 15 per cent.

Permanent Water Conservation Measures

Permanent Water Conservation Measures are low-level water restrictions that were introduced across SEQ on 1 December 2009—the first time that common restrictions had applied across the region. These measures reflect feedback on the Strategy that the community supports the ongoing use of low-level restrictions, provided that the focus is on water efficiency rather than water use volume.

Permanent Water Conservation Measures have been designed specifically to capture long-term demand savings, such as through integration with other demand management and water efficiency programs.

Time restrictions on outdoor water use are generally removed, except for a requirement to water gardens and lawns outside the heat of the day. There is also a requirement to use water-efficient devices, such as trigger nozzles on hoses, high-pressure cleaners and efficient irrigation.

Heavy residential water users will continue to be identified and, where high water use cannot be justified, the user will enter a program to assist their household to reduce water use. Section 4.3 highlights the importance of this program.

Permanent Water Conservation Measures also give effect to a small number of structural and operational measures that are not currently implemented through other means, such as the Queensland Development Code.

Outdoor water use requirements for non-residential water users are generally the same as for residents, except where a business wishes to irrigate an area greater than 500 square metres. Where this is the case, the business is required to develop an irrigation water efficiency management plan.

The QWC will review the Permanent Water Conservation Measures during 2010 and 2011. Working with key stakeholders, the QWC will review and refine each measure individually to ensure that it is necessary, effective and efficient. The QWC will specifically investigate whether some requirements should be integrated into end-user contracts, moved to other regulations, or discontinued. The review will focus on non-residential restrictions. Key residential restrictions, such as the restriction on the use of water for irrigation in the middle of the day, are not expected to change.

Target 200 is not part of Permanent Water Conservation Measures. It is a voluntary measure that will be actively encouraged but not enforced.

6.3.2 Demand management measures for investigation

A range of new structural, operational and behavioural water efficiency measures are currently being investigated, as are improvements to existing programs. In combination with the existing measures, these new measures will assist the SEQ community to meet our water savings targets. These new measures are listed below.

Demand management measures under investigation

Structural water use efficiency measures

Promote water use efficiency star ratings for non-residential property

Water consumption in office buildings will be monitored and rated on a scale of one to five stars (best practice is five stars).

Ban the sale of inefficient water devices

With the exception of toilets, plumbing and white goods, producers currently do not have to meet minimum water use performance standards. This measure involves working with the Australian Government and industry to develop and implement minimum standards. Consideration could also be given to expanding the range of products covered by the existing WELS scheme.

School water use efficiency

This measure involves a trial to assess the benefits of installing web-based smart monitoring and alarm systems on water meters in a number of schools. The web-based monitoring system is designed to trigger an alarm if water consumption rises above a pre-set level. Sydney Water has successfully trialled this type of monitoring. An audit of 13 Sydney schools showed that 44 per cent of water used within the grounds was lost through leaks.

Operational water use efficiency measures

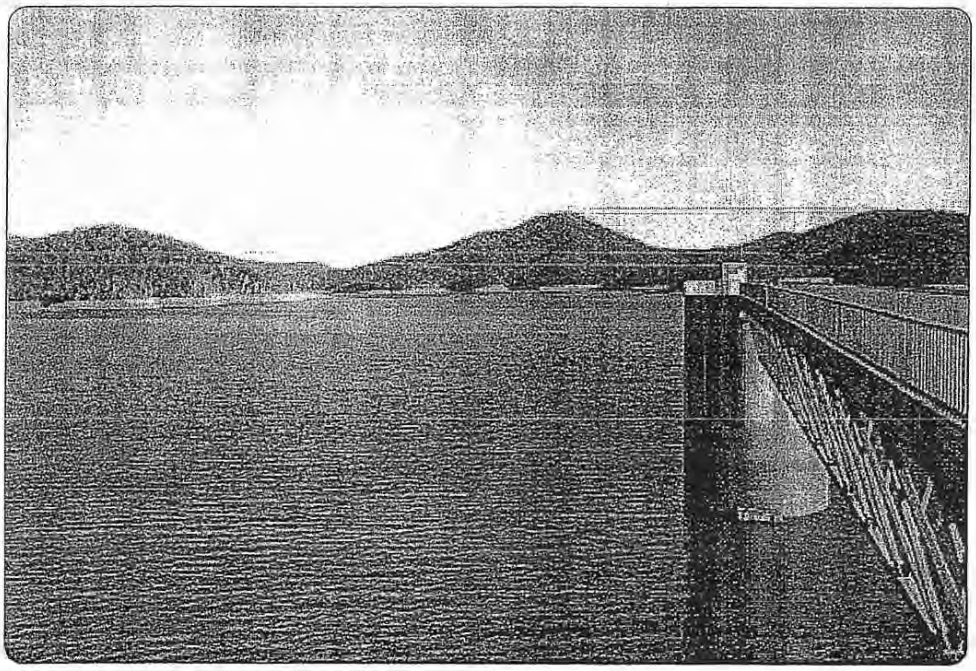
Targeted education programs for selected industries

This measure involves developing a training program for professions and trades involved in the sale and installation of water-using appliances and fixtures, and garden and landscaping products.

Behavioural water efficiency measures

Regionally consistent billing approach

This measure involves phasing in a standardised approach to billing information. Distributor-retailers are required to produce water bills in accordance with guidelines that specify a minimum content and format, with regular billing cycles. This will allow consumers to become more informed about their water consumption.



6.3.3 Updating the demand management program

A comprehensive review of the demand management program will be undertaken regularly and as part of future reviews of the Strategy. Additional demand management measures will be identified as part of continuous improvement. These measures will be informed by changes in population growth, climatic conditions, consumption trends and community expectations, as well as technological developments and the timeframe for constructing additional sources of supply.

The LOS objective for the volume of water to be supplied in normal times (375 litres per person per day for all uses) might be amended at the next review of the Strategy if average water use across the region remains significantly below the planning assumption.

In assessing any changes to the LOS objectives for supply in normal operating mode, consideration will be given to the impact on the scope for future restrictions if the T1 trigger is hit. Once residents, business and industry achieve best practice water use efficiency, consumption cannot be further reduced without significant economic or lifestyle impacts. These matters could affect the LOS objectives relating to the severity of restrictions.

Consistent with the approach adopted in the Strategy, additional demand management measures should be undertaken where they are cost-effective compared to the cost of building new supplies.

6.4 Meeting the supply gap

This section summarises potential supply options and infrastructure programs. Some of the minor dam and weirs projects could also be developed to improve availability of water for rural users, subject to their capacity to pay.

As explained above, major new supplies are unlikely to be required for at least 10 years. The Strategy seeks to further defer when these supplies are required through:

- the efficient operation of existing infrastructure (refer to Sections 3.1 and 7.2.2)
- ongoing water efficiency (refer to Sections 4.4, 6.2 and 6.3)
- the integration of local supplies into new development (refer to Section 4.6).

Section 5.4 outlines a range of investigations into potential supplies that will inform future revisions of the Strategy. The investigations will also establish a benchmark against which water efficiency and local supply options can be assessed. For example, as noted in Section 4.6, some local supplies might be able to exceed the minimum requirements in the Queensland Development Code. Options that improve water savings locally should be implemented if they meet all regulatory requirements and if the incremental cost above the minimum requirements is equal to or less than the cost of major new supplies, compared on a triple bottom line basis. The QWC is investigating methods for objectively undertaking such assessments.

6.4.1 Potential supply options

Future supply options were identified in Chapter 5 and are listed in Table 6.1.

Table 6.1 Potential sources of supply for detailed investigation

Type of source	Potential source
Desalination sites	• Marcoola (priority site) • Lytton, near the Brisbane River mouth (priority site) • Expansion of the facility at Tugun on the Gold Coast (reserve site) • Bribie Island (reserve site)
Dams and weirs	• Borumba Dam Stage 3, water harvesting from the Mary River or a combination of both • Raised operating levels in Wivenhoe Dam • Raising of the Mt Crosby Weir • Additional minor supplies in the Logan and Albert catchment, including potentially a pipeline between the Bromelton Off-stream Storage and Wyaralong Dam
Purified recycled water schemes	• Augmentation of Hinze Dam • Augmentation of North Pine Dam
Decentralised systems	• Investigations into proposed sites, including North Brisbane and the Sunshine Coast for stormwater, rainwater systems and local recycling

Based on existing technology and identified alternative water source options, desalination is currently the only practical supply to fill a regionally significant supply gap. Desalination facilities at the priority and reserve sites will underpin water security for SEQ. Current information indicates that these sites could accommodate desalination facilities with a combined capacity of over 300 000 megalitres per year. With improvements in technology, the same sites could accommodate facilities with more capacity.

There are limited bulk supply options beyond these sites. As explained in Section 5.4.2, dam and weir options could supply an additional 50 000 to 100 000 megalitres per year in normal operating mode. In addition, two purified recycled water schemes that could supply up to 100 000 megalitres per year have been identified for detailed investigation. However, the development of these schemes depends on improved community confidence in purified recycled water.

The supply gap could be reduced if local supplies achieve savings larger than required for new houses under the water savings targets. Detached houses must target savings of 70 000 litres per year, while terrace houses and townhouses must aim to achieve savings of 42 000 litres per year. These savings could be met by internally plumbed rainwater tanks, stormwater harvesting, dual-reticulation recycled water schemes, or the treatment and reuse of greywater. For new houses, the water savings target is forecast to reduce demand by about 60 000 megalitres per year by 2056. However, higher savings might be cost-effective in particular locations and sites—for example by adopting a water-sensitive urban design approach that seeks to integrate stormwater harvesting with stormwater management.

Due to the limited opportunities available, there are currently no plans for substantial increases in the volume of water extracted from groundwater.

6.4.2 Potential supply portfolios

This section presents the preferred portfolio of projects to fill the supply gap, based on current forecasts and pending detailed investigations of potential supplies, as described in Section 3.5

The final selection of each future water supply project will be made based on detailed feasibility studies coupled with the latest information on regional growth patterns and climate change impacts. Section 3.5 describes the process by which the QWC will assess options and make a recommendation to the Minister.

In the meantime, a number of potential infrastructure programs have been developed based on information currently available.

The projects in these programs have been timed to ensure that LOS system yield exceeds forecast demand at all times. This approach does not put water security at risk, but defers both capital expenditure and minimum operating costs. In turn, this defers the impact of price increases. Deferring the next supply also provides time for technology to improve, with a range of potential benefits in terms of cost and efficiency.

The portfolios were based on sub-regional demand and supply analysis. The distribution costs and the capacity of interconnections in the SEQ Water Grid were key considerations for the sequence, timing and location of supply projects. For example, it is expected that the desalination facility at Tugun will only be duplicated from around 2030, following the emergence of significant further population growth on the Gold Coast.

The analysis assumed average total regional consumption across SEQ of 375 litres per person per day, with some differences between locations. Lower consumption could significantly defer the need for augmentation and the sequencing of new supplies across SEQ, including as a result of achieving Target 200.

The portfolios will be reviewed and updated in the future reviews of the Strategy. In particular, detailed investigations could find that some potential projects are not viable or could highlight advantages and disadvantages that were not taken into account at an earlier time. The framework developed for these assessments can also be adapted and applied to any portfolio being considered, including local water supplies or demand management initiatives that exceed the minimum standards.

Medium series population growth

Figure 6.3 illustrates one potential infrastructure program, based on average total consumption of 375 litres per person per day, medium series population growth and no allowance for climate change. This scenario identifies:

- the development of a desalination facility at either Marcoola or Lytton as the next major augmentation of the SEQ Water Grid, with connecting pipelines constructed to enable a duplication of the facility when required
- the expansion of this desalination facility, around 2030
- the third major augmentation being the development of the other priority desalination site
- the final augmentation being the expansion of the existing desalination facility at Tugun, which is identified as occurring beyond 2030 in order to supply new development on the Gold Coast.

In total, this scenario involves development on three of the four desalination sites. While the desalination facilities only provide an additional 155 500 megalitres per year of capacity to the system, the LOS system yield increases by approximately 185 000 megalitres per year due to an improvement in the performance of the dams. Pending detailed investigations other options, such as dams and weirs, could reduce the need for desalination.

In addition, this program includes raising the operating level of Wivenhoe Dam and raising Borumba Dam (with allowances for the impact of climate change). Both of these options require detailed investigations, with a range of technical and environmental issues to be addressed. However, they would be less energy-intensive than desalination and, at least in the case of Wivenhoe Dam, cheaper.

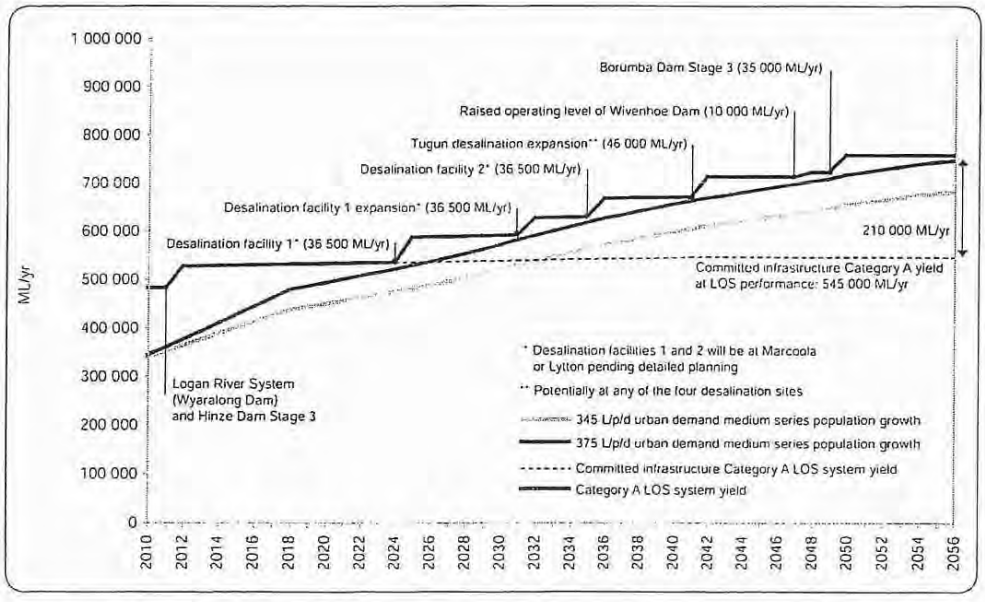


Figure 6.3 Potential portfolio with medium series population growth (subject to detailed planning and assessment)

High series population growth

A sensitivity assessment has been undertaken, indicating the impact of high series population growth and no allowance for climate change. In this scenario, up to 369 300 megalitres per year of additional supply capacity would need to be constructed by 2056.

A possible portfolio of supply options to meet this increased demand is presented in Figure 6.4.

The first augmentations are the same as for the medium series population forecast scenario.

Beyond the upgrades of Wivenhoe and Borumba dams, additional desalination facilities and the expansion of some of these facilities would be required. These facilities could be located at Marcoola, Bribie Island or Lytton. Pipeline costs and environmental considerations would determine the preferred location and sequence of these facilities.

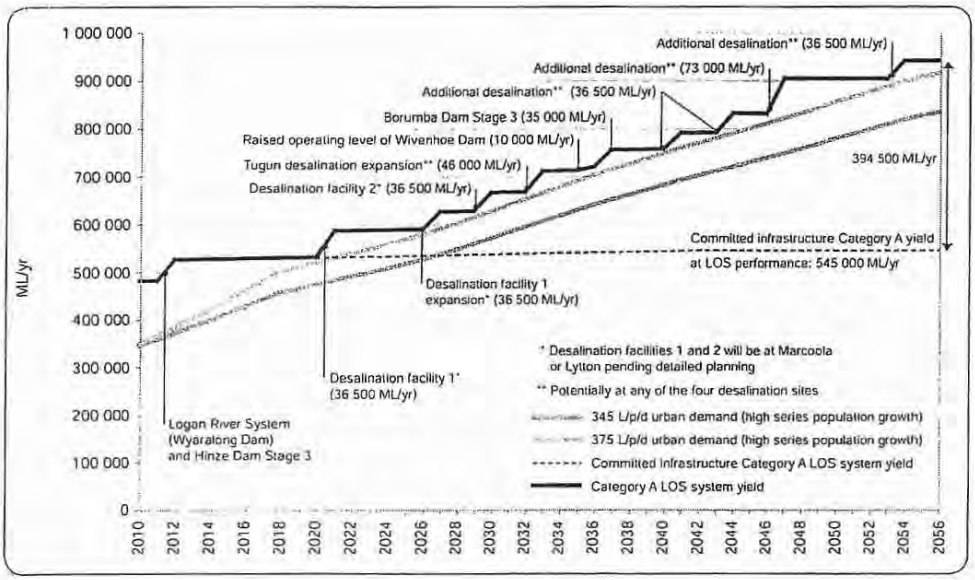
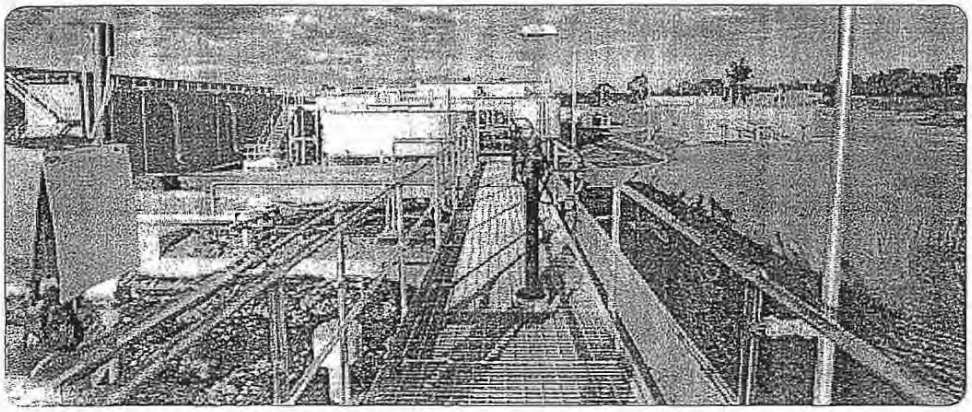


Figure 6.4 Potential portfolio with high series population growth and no allowance for climate change (subject to detailed planning and assessment)

Impact of reduced consumption

Reducing average consumption will defer and reduce the need for additional desalination facilities. Figure 6.3 shows that with medium series population growth and average total regional consumption of 345 litres per person per day, it is possible that only two additional desalination facilities would be required before 2050. The need for the first of these facilities would be deferred to 2033, as explained in Section 6.2.



The portfolio with high series population growth and average total consumption of 345 litres per person per day would be similar to that identified in Figure 6.4. This reduction in consumption, which could be achieved by average residential consumption remaining at or below 200 litres per person per day, could result in fewer desalination facilities being required to meet demand.

Potential impacts of climate change

The extent and timing of any climate change impacts is another key variable for determining when the next bulk water supply might be required. As explained in Section 3.2, the CSIRO is currently undertaking downscaling modelling (reducing the size of modelling grids used for global scale models to smaller scales that are more useful for localised assessments) for SEQ through the Urban Water Security Research Alliance. The preliminary results indicate that, while climate change might reduce yield by about 10 per cent, the impact is likely to occur over decades, rather than immediately. A scenario has been prepared to assess such a possible climate change impact and is shown in Figure 6.5. Such a scenario may bring forward the next possible augmentation date to as early as 2017. However, as discussed above, this climate change impact is unlikely to occur in the immediate future.

The supply gap will reduce if population growth or the average regional consumption is below the planning assumptions outlined above. Conversely, it will increase if climate change impacts are greater than the assumed scenario or if average regional urban water consumption increases to greater than a regional average of 375 litres per person per day, or growth exceeds high series projections.

The volume required will also vary. Without additional water supplies, by 2056 the gap between supply and demand could be between 133 100 and 410 700 megalitres per year, depending on population growth, the demand for water and the impacts of climate change.

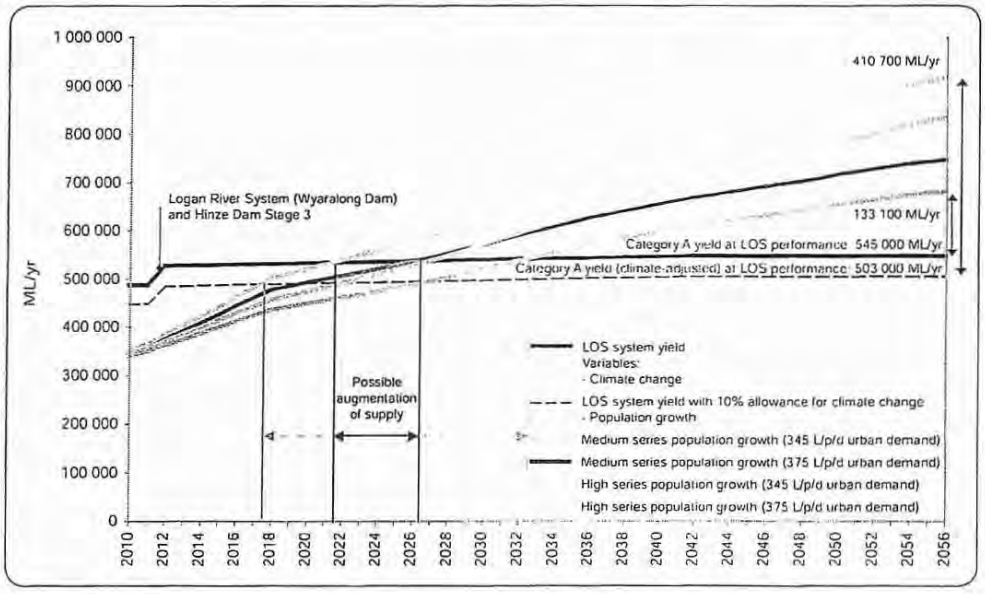


Figure 6.5 Category A water balance in normal operating mode and an allowance for climate change

The purpose of the Strategy is to bring on supplies at appropriate times to prevent this gap from developing. The QWC will monitor demand and supply forecasts on an ongoing basis. Changes to these forecasts will have a direct impact on the potential supply gap, which will be reflected in future revisions of the Strategy and the planning program for potential water supplies.

The construction of major new supplies could also be triggered as part of a drought response. However, with key SEQ Water Grid storages full or almost full, it is likely to be at least 10 years before storages fall to 30 per cent of capacity (refer to Section 6.9.1). The probability of this occurring prior to 2020 is estimated at about 1 per cent.

6.5 Rural towns and villages

The Strategy plans to provide increased security of supply to more than 200 000 residents of SEQ who live in towns that are not connected to the SEQ Water Grid. These residents rely on local surface water or groundwater supplies or on water from rainwater tanks.

6.5.1 Communities with reticulated drinking water

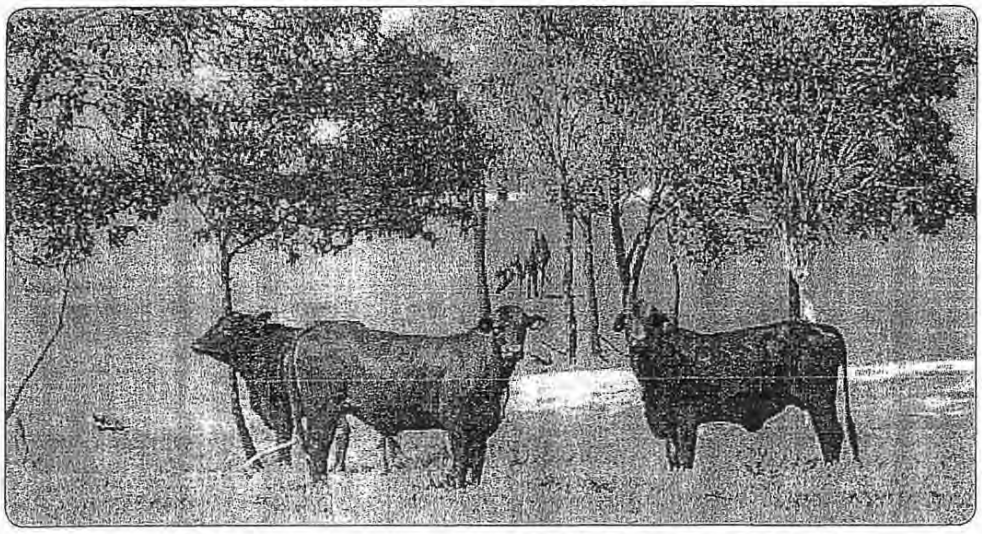
About 20 000 residents of SEQ live in communities that have reticulated drinking water supplies not directly connected to the SEQ Water Grid. These communities have a diverse range of water supply sources and varying levels of security. They also differ in terms of size and forecast population growth.

The Strategy seeks to achieve the same security of supply for these communities in the future as for those connected to the SEQ Water Grid.

A number of these communities are already benefitting from improved security of supply, following the completion of SEQ Water Grid projects.

In the Logan River system, the construction of the Bromelton Off-stream Storage and Cedar Grove Weir has allowed the SEQ Water Grid Manager to reduce the demand on Maroon Dam, increasing supply reliability to the communities of Beaudesert, Kooralbyn and, to a lesser extent, Rathdowney. These communities rely on high priority water allocations from the Logan River Water Supply Scheme and have previously experienced restrictions once every 10 years, on average. With the new supplies, hydrologic modelling indicates that it should be possible to reduce the frequency of restrictions to less than once every 15 years, on average. In the short to medium term, it could even be possible to achieve the LOS objectives.

In the Warrill Valley system, more than 8000 megalitres per year of high priority water allocation has been made available. Previously, 7000 megalitres of this allocation was held by the Swanbank Power Station, which is now supplied from the Western Corridor Recycled Water Scheme. Through the SEQ System Operating Plan, the QWC has reserved this allocation to enhance the short-term security for urban users in Aratula, Boonah, Kalbar and Mount Alford.



The QWC is reviewing the future needs of all rural towns and villages with reticulated supplies. The review will inform decisions regarding supply augmentations and drought response planning. Options to improve security of supply include:

- directly connecting to the SEQ Water Grid through the construction of new pipelines
- augmenting existing sources of supply with additional surface and groundwater supplies
- carting water.

The Sunshine Coast Regional Council began constructing a water supply pipeline to Maleny from the Landers Shute water treatment plant in mid-January 2010. The pipeline is expected to be completed about mid-2010.

A range of options are being investigated for other communities. Table 6.2 lists the key priorities. The QWC will provide advice to the Queensland Government about the preferred means of securing supply to Beaudesert and Canungra in late 2010.

Table 6.2 Options to improve security of supply to rural towns

Town	Current investigations
Beaudesert	Options under investigation are a pipeline to the planned Wyaralong water treatment plant or an upgrade to the existing water treatment plant.
Canungra	Options under investigation include a pipeline to Beaudesert or the construction of an off-stream storage and an upgrade to the existing water treatment plant.
Dayboro	A pipeline from Petrie is being investigated. Moreton Bay Regional Council has completed a planning study concluding that the construction of a pipeline would be the most cost-effective option.
Boonah	A pipeline to either Ipswich or the planned Wyaralong water treatment plant is being investigated as a possible drought response measure.

For some communities, the LOS objectives will be targeted but might not be deliverable in the short term. The priority of connection will be determined based on the likelihood of restrictions and size of the community, including business and industry.

The Lockyer Valley Regional Council communities of Preston, Upper Flagstone and Upper Lockyer (bordering on Highfields) currently have water services supplied by Toowoomba Regional Council. This operating arrangement will continue.

Amity Point, Dunwich and Point Lookout on North Stradbroke Island already have very secure supplies and are unlikely to require augmentation.

For communities that are not physically connected to the SEQ Water Grid, security of supply will generally be maintained by water carting in severe drought.

6.5.2 Communities without reticulated drinking water

About 180 000 residents dispersed across SEQ in small villages and rural residential developments rely on drinking water from rainwater tanks and private bores.

These residents will be able to supplement local supplies from the SEQ Water Grid as necessary, through existing carting services. Water carters will continue to have regulated access to stand pipes, and residents will continue to be responsible for organising and paying for carting. Such arrangements will also continue to apply to communities such as Mt Tamborine. Demand forecasts for the SEQ Water Grid include water to supplement rainwater tanks during periods of low rainfall.

Local government planning schemes specify the minimum size of rainwater tanks required for new houses in areas where reticulated drinking water is not available. These requirements currently vary across SEQ. The QWC will review the minimum requirements for the size of rainwater tanks and connected roof area across SEQ, taking into account the costs of new rainwater tanks and carting. Local governments could choose to mandate larger tanks than the minimum size.

Over time, reticulated drinking water could be supplied to some rural villages that are currently supplied from rainwater tanks and private bores. Factors that will be taken into account when considering supplying these villages with reticulated water include:

- demand from residents and industry
- population growth
- cost and cost recovery
- community views.

Local governments and the new distributor-retailers will decide whether a reticulated drinking water system will be provided to rural villages and determine pricing to provide service delivery to customers.

The QWC will develop a new policy framework to guide decisions regarding the supply of reticulated drinking water to communities that currently rely on drinking water from rainwater tanks and private bores.

6.6 Rural production

Water resource plans have assured access to water for rural production. However access to additional water for rural production and the cost of that water has proven to be a major challenge in parts of SEQ.

While some of the projects that have been constructed as part of the drought response are already delivering benefits for rural users in parts of SEQ, there is potential to do more.

The QWC and the Department of Environment and Resource Management will lead the investigation of a range of options to improve the availability of water for rural production. These options could increase the total amount of water available, or improve the reliability of its supply. They would build on existing entitlements, under which about 150 000 megalitres was used for rural production in SEQ in 2005, excluding recycled water and rural water consumption in the Mary Basin.

Any water supply initiatives in SEQ must directly address the needs of existing and potential producers. In most catchments the volume of unallocated water available under water resource planning is limited, meaning that there are no opportunities for major new rural supply dams. Recycled water could provide further opportunities, but can be expensive to transport over long distances.

Rural water advisory group

A rural water advisory group has been established to assist planning for rural water supply initiatives in SEQ. The group was established by the Queensland Farmers Federation, in partnership with the QWC and the Department of Environment and Resource Management. It will comprise representatives of rural water users, who will provide input to the investigations outlined in this section, ensuring that options address local needs.

6.6.1 Introduce tradeable allocations

Water allocated for rural uses in SEQ includes a range of high priority and medium priority entitlements from supplemented schemes and some unsupplemented water entitlements. A supplemented water supply is one that is made more reliable by releases of stored water from dams.

While available, some of these existing allocations are not being used or only partly used (i.e. 'dozers' and 'sleepers').

There are a range of reasons why allocations are not being used—for example, some farms that were previously irrigated are now used for less water-intensive activities. The reasons for these types of changes range from water not being available during the drought, to the land having been purchased as a hobby farm.

The QWC has received feedback from some irrigators that these entitlements do not match their business needs. For example, some irrigators have explained that major purchasers are increasingly requiring certainty of supply over a number of years. The irrigators have expressed concern that they cannot match these demands under their existing allocations. Some other irrigators have expressed concern that they often do not receive most of their announced allocations until after the planting season.

As water resource plans are progressively implemented in SEQ, water trading is likely to provide opportunities for expanding production through the movement of under-utilised existing water entitlements. The QWC, with the Department of Environment and Resource Management, will investigate options to facilitate trading in key areas as identified through the rural water advisory group.

6.6.2 Investigate options to increase reliability

The SEQ Water Grid provides a range of opportunities to conjunctively manage rural and urban supplies, potentially increasing both the volume and reliability of supply for rural use. Options that could directly benefit rural users include:

- providing access to surplus urban allocations on a temporary basis, in addition to existing rural allocations
- temporarily increasing the reliability of existing rural allocations or the announced allocations earlier in the water year, through under-utilised urban allocations.

Rural users can indirectly benefit if less than the full allocation is used for urban purposes. This occurs when water is held back in the dam, so as to be available during a severe drought, or is simply not needed at that time. Where the water is held back in the dam, announced allocations for rural users will be higher than would otherwise be the case.

Some of these indirect benefits are already being realised. In the Warrill Valley, as a temporary measure, the QWC has reserved 8250 megalitres of interim water allocation to enhance supply reliability for Boonah and connected towns, as explained in Section 6.5.1. As a result, Moogerah Dam will be maintained at a higher level than would otherwise be the case. In turn, announced allocations for rural users will generally be higher.

In the Logan River, the reliability of supplemented supplies to communities and rural irrigators has improved due to the construction of Cedar Grove Weir and the Bromelton Off-stream Storage and applying LOS objectives to the delivery of urban water supplies (refer to Section 6.5.1). Hydrological modelling indicates that application of LOS principles to the operation of the urban supplies will increase supplemented irrigator monthly supply reliability required under the water resource plan by up to 10 per cent. Options to further improve availability or reliability, for the period until Wyaralong Dam and the water treatment plant are constructed and while LOS system yield continues to significantly exceed demand, are being assessed.

Any such supply must occur within a transparent framework, which ensures that the costs are appropriately shared. The QWC will develop this framework in 2010 and 2011. The framework will address a range of issues, including the conditions of supply and the price to rural users. For example, the framework will specify when supply to rural users will be interrupted.

As background to the framework, the QWC will seek input from existing rural producers in partnership with the rural water advisory group and the local governments to establish whether existing entitlements meet local needs. Where they do not, the QWC, in collaboration with the Department of Environment and Resource Management, will assess possible options that address these needs within the water resource planning framework.

Options for conjunctive management of urban and rural water supply apply in specific catchments, generally where an urban water supply source is located upstream of rural irrigation areas. These circumstances apply to:

- Borumba Dam on the Mary River
- Wivenhoe Dam on the Brisbane River
- Maroon Dam and the Bromelton Off-Stream Storage on the Logan River
- Moogerah Dam in the Warrill Valley.

The QWC will also investigate these options in 2010 and 2011.

6.6.3 Increase the use of recycled water

About 245 000 megalitres of treated wastewater was discharged from wastewater treatment plants in SEQ in 2006. About 17 000 megalitres of this was recycled, including about 400 megalitres for rural production. By 2056, it is forecast that the amount of treated wastewater available for recycling will exceed 400 000 megalitres per year.

The QWC is investigating a range of opportunities to increase the use of recycled water for irrigation, as a means of increasing rural production and improving the health of waterways and Moreton Bay. Some of these investigations are discussed below.

Western Corridor Recycled Water Scheme

The Lockyer Valley is generally regarded as one of Australia's most productive horticultural regions. It contains over 40 000 hectares of the most productive horticultural soil in Queensland. However, water availability and reliability has become increasingly critical to growing operations. Declining volume and quality of both surface water and groundwater in the valley has led to a reduction of up to 75 per cent in the productivity of this key horticultural production area. Recent surveys indicate that current production operates at only 20 to 30 per cent of total potential due to the poor reliability of the water supply.

The supply of recycled water from the Western Corridor Recycled Water Scheme has the potential to significantly improve water availability, and especially water reliability. This reliability is fundamental to restoring profitability and productivity to the irrigators, and vibrancy to the area. For example, it could restore farm practices of planting three crops per season and thereby allow local irrigators to secure a stable and sustainable share of the Brisbane and Sydney markets.

It could also help to transform farm practice and crop selection to higher value products. At present, Lockyer Valley irrigators mainly grow cereal, fodder and forage crops that do not have the same value as fruit, flora and vegetable crops. Water reliability would enable more of these farms to grow higher value crops, ensuring their long-term economic sustainability and a more sustainable supply located close to the Brisbane market.

The Queensland Government first announced that 32 000 megalitres per year would be available from the Western Corridor Recycled Water Scheme for supply to irrigators in mid-2006. Supply is contingent on a number of conditions, which were made clear in the business case and have been reflected in draft term sheets and negotiations. These conditions include that:

- supply ceases when key SEQ Water Grid storage levels fall to 40 per cent of combined capacity
- pricing is at short-run marginal cost
- a sustainable management regime is implemented over the Lockyer Valley aquifers.

As outlined in Section 5.4.4, the optimal operating strategy for purified recycled water is currently to use it to augment Wivenhoe Dam only when key Water Grid storage levels fall to 40 per cent of capacity. This mode of operation means that recycled water will be available for supply to Lockyer Valley irrigators at all other times.

In addition, the amount of recycled water available for rural production from the Western Corridor Recycled Water Scheme in normal operating mode could increase over time from 32 000 to 37 000 megalitres per year. The time at which the additional Category B recycled water became available would depend on the rate of increase in feed water flows to the Western Corridor Recycled Water Scheme and demands for urban use.

The Lockyer Water Users Forum has proposed a number of recycled water schemes prior to and following this announcement. Each of these schemes has involved distribution from the Western Corridor Recycled Water Scheme direct to irrigators, and each has relied on further funding commitments by the Queensland and Australian governments to be economically viable.

The SEQ Water Grid Manager and the QWC are now investigating a number of options to enable the supply of recycled water to the Lockyer Valley at less overall cost. These options include using the existing Western Corridor Recycled Water Scheme pipeline and existing irrigation dams as balancing storages. If these investigations prove to be unsuccessful, supply of a smaller volume of recycled water to irrigators near the existing pipeline will be considered. The SEQ Water Grid Manager and the QWC will continue to consult with irrigators.

Other investigations

The QWC is investigating options for regionally significant recycled water schemes across SEQ, as part of sub-regional total water cycle planning (refer to Section 2.4.5).

The first sub-regional total water cycle management plan has involved detailed assessment of the potential for reusing treated wastewater from the Beaudesert and Flagstone areas for irrigation purposes along the Logan River. The advantages of this option include an increase in water for rural irrigation and a significant reduction in the discharge of nutrients into the Logan River.

The QWC will also investigate other local reuse opportunities, in areas such as Redland Bay and Somerset. Some of these opportunities are being investigated as an alternative to, or to supplement, a planned upgrade to a wastewater treatment plant in the area. Studies are required to determine the viability of using the treated wastewater, potential uptake, and costs of any new or upgraded infrastructure.

At the local scale, schemes could be identified as part of local government planning processes or by a distributor-retailer. Any recycled water scheme would be subject to physical supply constraints, pricing that reflects at least the short-run marginal cost of supply and compliance with relevant water resource plan and water quality requirements.

6.6.4 Investigate potential surface storages

Under water resource planning, there are few remaining opportunities in SEQ for surface storages for urban or rural purposes.

The QWC will undertake detailed investigations of remaining options in the Logan and Mary basins, as explained in Section 5.4.2. These investigations could identify small storages that might be used for rural purposes, subject to cost and within the requirements of water resource plans.

Rural water availability in the Warrill Valley area could be further increased if and when a pipeline is constructed to Boonah from the SEQ Water Grid.

6.6.5 Increase efficiency

Improved rural water use efficiency will continue to be driven by:

- programs to improve farm efficiency, such as the SEQ Irrigation Futures program
- water markets and trading
- appropriate pricing to better reflect National Water Initiative pricing principles
- more efficient rural water supply schemes.

Queensland Government initiatives for rural water supply

Rural Futures Strategy

The Rural Futures Strategy has been released as part of the Regional Plan. The Rural Futures Strategy supports the sustainable economic and social development of rural areas in SEQ. It builds on existing strategies, policies and programs, providing a whole-of-government approach to address planning and economic issues in rural SEQ.

SEQ Irrigation Futures

SEQ Irrigation Futures is a partnership program between the Queensland Government, five major irrigation industry groups and SEQ Catchments to help irrigators use water more efficiently. An efficiency gain of 12 per cent was achieved across all irrigation sectors in the region by the end of 2009, equivalent to approximately 21 000 megalitres per year. The program addresses irrigation management and impacts from irrigation. It includes system efficiency assessments, field trials and workshops and, where appropriate, financial incentives to assist irrigators to cut consumption.

Rural Water Use Efficiency Initiative

The Rural Water Use Efficiency Initiative is a partnership between the Queensland Government and seven industry groups. It helps irrigators to improve on-farm management of natural resources and reduce off-farm impacts, particularly through efficient irrigation and management of nutrients. The initiative includes extension activities, on-farm trials, demonstrations and system assessments, and financial incentives to upgrade irrigation and effluent management systems. The Queensland Government has committed $6.5 million over four years.

Knowledge Management System for Irrigation

An internet-based system that assists irrigators to manage a range of water issues on their properties was launched in August 2008. Known as the Knowledge Management System for Irrigation, it is an initiative of SEQ Irrigation Futures and it gives irrigators and industry personnel access to decision making tools, water use calculators and natural resource information. This enables irrigators to improve aspects of their water management, such as irrigation scheduling and pump efficiency.

Water metering project

In 2005, the Queensland Government initiated a statewide policy to establish a consistent approach for metering unsupplemented water taken for irrigation and other commercial purposes. Metering is a cornerstone of the National Water Initiative. It ensures the fair use of resources, enhances entitlement security and reliability, and improves water planning and management outcomes.

6.7 Supplies to outside SEQ

In the same way that SEQ's water supplies could be affected by the ability to source water from outside SEQ, consideration has also been given to supplying water from SEQ to neighbouring communities.

With the completion of key SEQ Water Grid assets, a level of water security has been reached that enables consideration of further opportunities to supply water outside SEQ.

A substantial amount of work is required to prepare a policy framework that would govern supplies from the SEQ Water Grid to urban areas outside the SEQ region, including economic and operational principles, standard contractual provisions and even possible inter-governmental agreements.

Any new supply should be on a full commercial basis. The price will vary depending on whether the supply is interruptible and whether it brings forward the timing of the next major supply.

Any supply of water to irrigators and to urban areas outside of SEQ will not be permitted to impact on the achievement of the LOS objectives for urban customers within SEQ.

6.7.1 Toowoomba

The Queensland Government has made a commitment to supply up to 10 000 megalitres per year from Wivenhoe Dam to the Toowoomba Regional Council area. This supply has been factored into demand forecasts and the water balance.

Supply could increase to 18 000 megalitres per year over time, depending on demand from the Toowoomba Regional Council area.

6.7.2 Cooloola region

The QWC will investigate options to operate the SEQ Water Grid to improve the volume and reliability of supply to towns in the Mary Basin (refer to Section 5.4.2).

In the short to medium term, when supply for SEQ exceeds demand, Noosa could be supplied from the Northern Pipeline Inter-connector Stage 2 rather than from Borumba Dam. This would enable the SEQ Water Grid Manager to make additional water available from Borumba Dam for local purchase and use, potentially deferring the need for additional supplies in the Mary Basin.

In the longer term, new supplies could be developed in the Mary Basin for local use and to supply the SEQ Water Grid.

6.7.3 Tweed

With the current high level of security of supply from the SEQ Water Grid, the Queensland Government will consider supply to the Tweed Shire Council area and other adjoining areas, where supply has no impact on the achievement of the LOS objectives for SEQ and on a full commercial basis, without subsidy or a price path.

6.8 Energy

The SEQ Water Grid will become increasingly energy-intensive over time, due to the operation of manufactured water sources and interconnecting pipelines. This section outlines the energy savings that will be achieved through demand management and the efficient operation of the SEQ Water Grid.

6.8.1 Total water cycle energy use

Energy use for water supply and wastewater collection and treatment represented about 0.1 per cent of energy use in the total urban system in SEQ in 2006–07.

Actual energy consumption for water supply varies across the region. About 2430 megajoules of energy was consumed for every megalitre of water supplied in Brisbane in 2006–07. By comparison, the energy intensity of supplying water to the Gold Coast from Hinze Dam is relatively low (about 750 megajoules per megalitre of water supplied), due to the lower treatment requirements and the height of the dam.

Tertiary treatment of wastewater before discharge to Moreton Bay is a significant user of energy in the SEQ water cycle. In Brisbane, wastewater treatment plants use another 2070 gigajoules for every megalitre of water supplied. On the Gold Coast, wastewater treatment plants use 3600 gigajoules per megalitre of water supplied.

The end uses of water are responsible for substantially more energy consumption and greenhouse gas emissions than its supply. Most of this energy is used to heat water. Across Australia, water heating is responsible for about 25 per cent of residential energy demand and 27 per cent of greenhouse gas emissions in households, excluding transport.

By comparison, residential hot water systems are estimated to use about 0.5 per cent of energy use in the total urban system in 2006–07. On the Gold Coast, it is 1.3 per cent—more than nine times the energy used for water supply and wastewater collection and treatment.

This section focuses on the energy used in the operation of the SEQ Water Grid. However, it is acknowledged that water efficiency can also contribute to major reductions in energy consumption for residential and non-residential end uses and for collecting, treating and discharging wastewater.

6.8.2 Avoided energy use due to demand management

A demand management program across all customer groups is an integral part of the Strategy, as outlined in Section 6.2.

Maintaining average regional urban consumption at or below 375 litres per person per day will result in a total energy saving of around 315 000 megawatt hours per year in 2020 compared to pre-drought trends, increasing to around 720 000 megawatt hours per year by 2048 (refer to Table 6.3). Additional savings will be achieved if actual consumption is less than the planning assumption of 375 litres per person per day. These estimates highlight the importance of the demand management program in reducing the need for additional energy-intensive water supplies. The estimates are based on the updated portfolio, including the greater use of desalination and increased energy intensity.

These estimates are also based on most of the additional demand being supplied from desalination and using the energy intensities described in Figure 6.6. It represents a saving of about 40 per cent in energy consumption for the supply of bulk water and is equivalent to the total energy consumption of about 86 000 homes.

These estimated energy savings reflect current technology and do not take into account the effects of state and federal government policies such as the Mandatory Renewable Energy Target, Renewable Energy Target and any future emissions trading scheme.

The savings listed in Table 6.3 relate to SEQ Water Grid assets. Energy consumption for distributing treated water and collecting and distributing wastewater is also likely to be reduced. The analysis also does not include energy savings to residents and businesses inside the home or business associated with the demand management program. Conversely, the estimate does not include additional energy requirements associated with local supply solutions such as rainwater tanks and greywater systems.

Table 6.3 Forecast energy savings from demand management (medium series population growth, no allowance for climate change and including rural communities within the SEQ Water Grid)

	2020		2048	
	Forecast demand for Grid water (Megalitres per year)	Forecast Grid energy consumption (Megawatt hours per year)[1]	Forecast demand for Grid water (Megalitres per year)	Forecast Grid energy consumption (Megawatt hours per year)[1]
Pre-drought trends	608 000	769 000	867 000	1 896 000
With the demand management program	491 000	454 000	701 000	1 176 000
Savings due to water efficiency	117 000 (19 per cent)	315 000 (41 per cent)	166 000 (19 per cent)	720 000 (38 per cent)

Note: Data has been rounded, including the savings estimates.

1 Assumes that the SEQ Water Grid is operated to maximise energy efficiency.

6.8.3 Energy to deliver water

Until recently, SEQ's water has been supplied through dams and other low energy intensity infrastructure. Diversifying the sources of supply to achieve the LOS objectives comes with an increased energy cost. Managing this increase is a key consideration for water supply planning.

As illustrated in Figure 6.6, water from desalination is expected to be significantly more energy-intensive to produce than treated dam water. The energy requirements are based on the infrastructure operating at capacity. While the energy requirement for transporting water is similar for all new sources, the increased movement of water around the SEQ Water Grid will increase the overall energy intensity of the region's water supply.

Water supplied from rainwater tanks can vary enormously in its energy intensity. Water that is delivered by gravity, with no additional treatment, does not require any other energy inputs. However, water that is treated to drinking water quality and delivered by pump can exceed the energy intensity of water produced from local dams or even the Western Corridor Recycled Water Scheme.

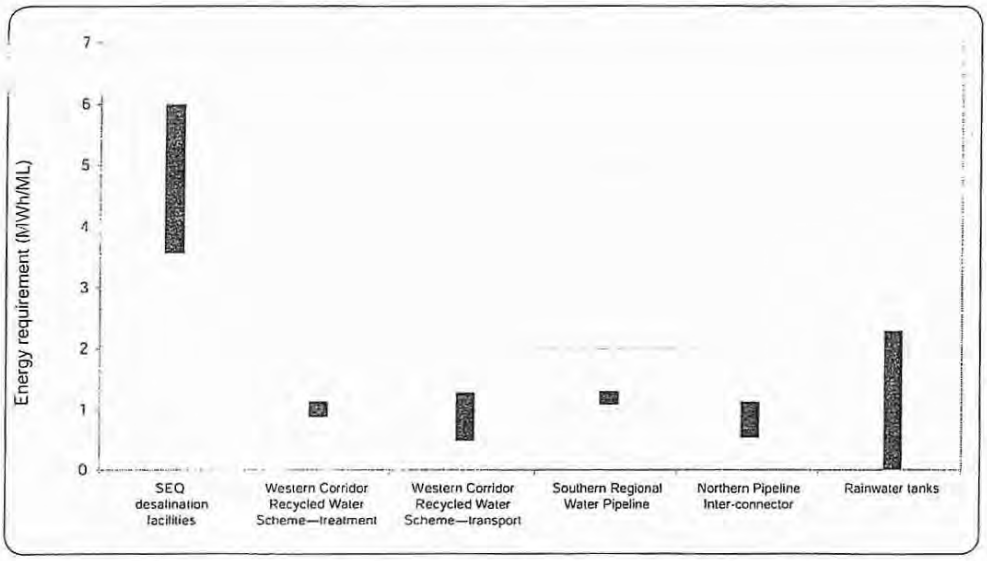


Figure 6.6 Estimated energy intensity of selected components of the SEQ Water Grid

Figure 6.7 shows the forecast energy required to produce water if the SEQ Water Grid were operating at capacity in 2020.

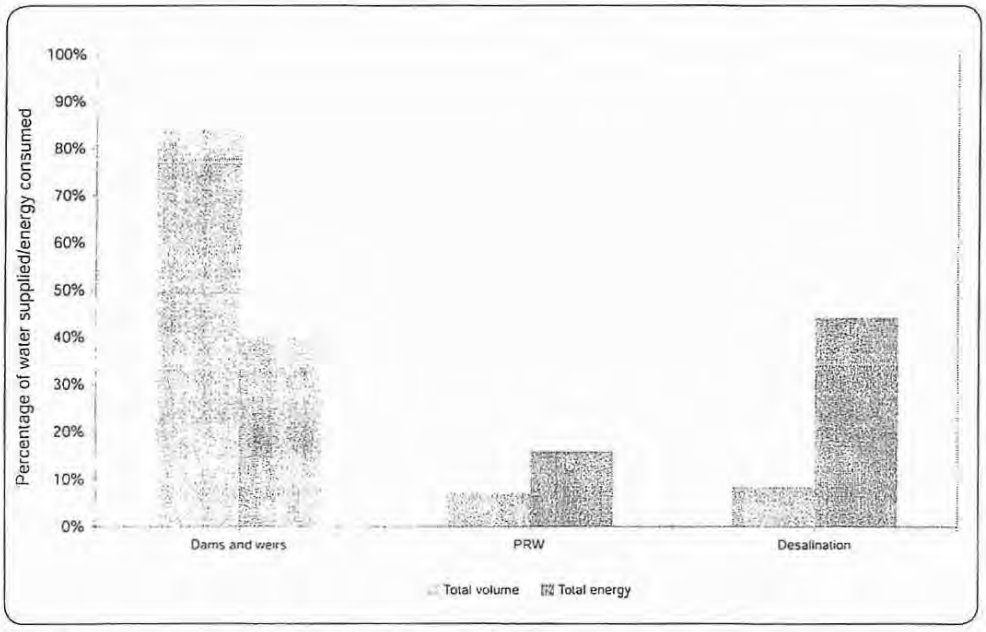


Figure 6.7 Projected water production capacity and associated energy consumed in 2020

In practice, desalination and purified recycled water schemes will not be required to operate at maximum capacity at all times. Figure 6.8a illustrates the estimated energy required to operate the SEQ Water Grid if population grows in line with the medium series projections. Figure 6.8b shows the energy usage if population growth tracks on the high series projections. At any time, actual energy used will be within the ranges ... ed. Without the demand management program, significantly more water would be required, and the overall energy requirement would increase accordingly.

The average energy intensity of water supplied from the SEQ Water Grid is estimated to be about 0.5 megawatt hours per megalitre per year in 2010. As the proportion of desalination supplies increases over time, the average energy intensity of water will increase to about 0.9 megawatt hours per megalitre per year in 2020 and 1.6 megawatt hours per megalitre per year in 2050.

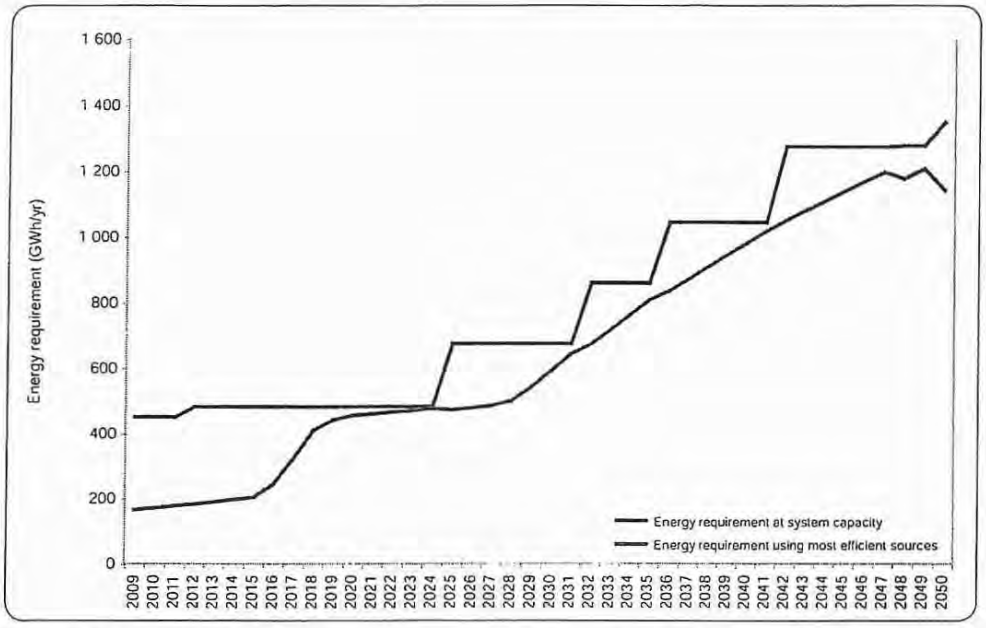


Figure 6.8a Estimated energy consumption for bulk water supply (proposed portfolio, medium series population growth, no allowance for climate change)

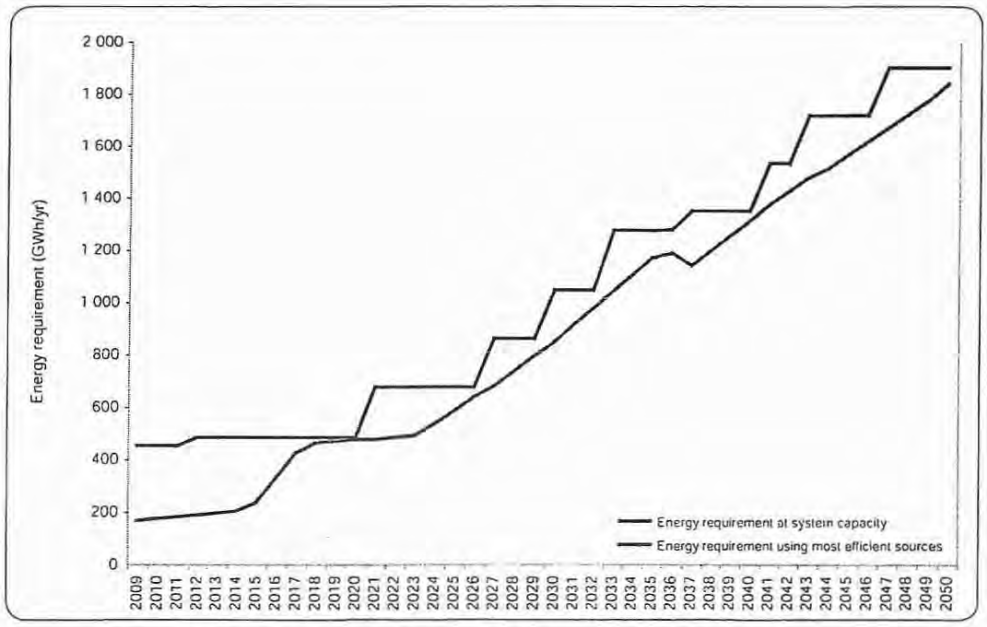


Figure 6.8b Estimated energy consumption for bulk water supply (proposed portfolio, high series population growth, no allowance for climate change)

If average total consumption is maintained at 345 litres per person per day, the projected average energy intensity and greenhouse gas emissions from the grid would reduce.

The QWC will assess all aspects of energy consumption associated with projected new water sources and factor these into water supply planning.

6.8.4 Greenhouse gas emissions of water supplies

Greenhouse gas emissions are calculated from energy use by applying greenhouse gas emissions factors, calculated by considering all the emissions associated with energy production and transmission. Emissions are standardised to carbon dioxide equivalents published by the Australian Government Department of Climate Change and Energy Efficiency. The emissions generated for each kilowatt hour of electricity supplied in Queensland are equivalent to approximately 0.89 kilograms of carbon dioxide.

[illegible]cure is purchasing renewable energy certificates to offset the operational energy requirements of the SEQ (Gold Coast) Desalination Facility.

Conversely, fugitive emission such as nitrous oxide and methane from wastewater treatment processes or methane emissions from water storages could be significant in some systems.

6.8.5 Water and energy reporting

Industries across the country are increasingly required to become more energy- and water-efficient. The co-dependence of energy and water in many industries presents opportunities to improve water and energy efficiency simultaneously, with users receiving a net benefit of lower electricity and water bills.

Industries are currently targeted under mandatory federal and state initiatives to identify and report on energy efficiency opportunities. At the same time, large water using industries in SEQ are required to implement water efficiency management plans.

The overlap between mandatory reporting for energy and water could result in potential for synergies, conflicts and duplication between an individual business's water and energy management plans. The QWC proposes to work in collaboration with water service providers and the Queensland and Australian governments to improve the efficiency of reporting for industry and move towards streamlined water and energy reporting.

6.9 Drought response planning

The purpose of drought response planning is to ensure continuity of supply consistent with the LOS objectives and regardless of climatic conditions, as explained in Section 3.1.2. The proposed process for developing and implementing the regional drought response plan is described in Chapter 7.

Under the LOS objectives, a regional drought response plan is expected to be triggered no more than once every 25 years, on average. Three out of four of these droughts will ease within the preparatory phase, before the construction of new supply sources commences.

Drought response plans will also be maintained for communities that have reticulated drinking water supplies not directly connected to the SEQ Water Grid.

6.9.1 Probability of triggering implementation of a drought response plan

SEQ now has a much more secure water supply than it did prior to the Millennium Drought, due to the efficient use of water and the completion of climate resilient supplies and interconnections. Due to this improved level of security, it is likely that the next augmentation will be triggered by population growth, rather than another severe drought.

The QWC models short-term security based on the combined levels of the twelve key SEQ Water Grid storages, including dams in the Sunshine and Gold Coasts. The combined level of these storages provides the trigger to initiate water strategy measures, such as implementing water restrictions.

Figure 6.9 shows probable dam levels of the next five years, based on different drawdown curves that have defined probabilities that the dams will be drawn down at a greater rate. For example, the 99 per cent curve shows dam levels that have a 99 per cent probability of exceedence at any point along the curve (that is, there is only a 1 per cent chance that these low levels will occur). The drawdown curves use data for inflows, rainfall and weather patterns extending back for 117 years as inputs to stochastic modelling.

The model illustrates that there is a less than 1 per cent probability of dams falling to 40 per cent of combined capacity over the next five years, which would trigger the implementation of the regional drought response plan.

The model also illustrates that there is an even lower probability of key SEQ Water Grid storages falling to 30 per cent of capacity before the end of 2014, triggering the construction of new climate resilient supplies.

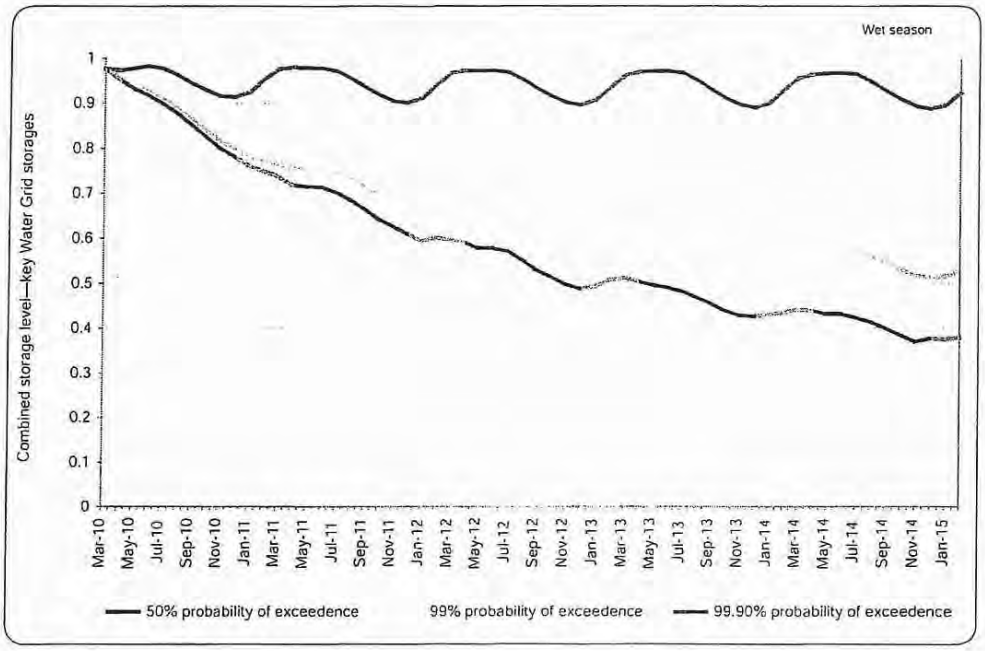


Figure 6.9 Forecast SEQ Water Grid storage levels

The modelling is based on average regional urban consumption across SEQ of 375 litres per person per day, and includes an allowance for medium series population growth. Lower levels of consumption will result in higher dam levels than are reflected in the model. The model is based on operation of the SEQ Water Grid in accordance with the existing SEQ System Operating Plan (for instance, one of the requirements of the existing SEQ System Operating Plan is to reduce production from the SEQ (Gold Coast) Desalination Facility to one-third of capacity when dam levels are high). It also takes into account supply from Wivenhoe Dam to Toowoomba and new sources, including Wyaralong Dam from 2012.

6.9.2 Drought supply requirement

The drought response plan will include a combination of applying Medium Level Restrictions, introducing purified recycled water to Wivenhoe Dam and constructing climate resilient supplies. The drought response plan should consider the ability to construct sufficient new climate resilient infrastructure within a nominal 30 months. This timing would be reviewed based on the preparatory planning outlined above.

The drought supply requirement is the gap between restricted demand and the climate resilient supply capability of existing supplies at any time over the planning horizon. This is the amount that would need to be supplied by the drought infrastructure, which must be able to be commissioned within the 30-month period to achieve the LOS objectives. This timeframe will be refined based on the amount of preparatory work undertaken and the level of preparedness.

As explained in Section 5.3.3, climate resilient and independent supplies are forecast to increase to about 331 700 megalitres per year following the completion of the committed projects. At this time, climate resilient supplies will comprise about 63 per cent of the LOS system yield, compared with 40 per cent in 2006.

As a result, much less infrastructure would need to be constructed in response to another severe drought than was required in response to the Millennium Drought. The drought response plan of the time would need to address these requirements

There might be a practical limit to the amount of infrastructure that can be constructed as part of a drought response. For example, if the drought supply requirement were to become greater than 180 000 megalitres per year at any point in time, it might not be possible, if a drought occurred, to procure and commission sufficient drought infrastructure in time to avoid extreme level restrictions—meaning that the LOS objectives would be at risk of not being achieved. These risks can be reduced through construction of additional climate resilient supplies as part of infrastructure development to maintain supplies during normal conditions. These factors should be considered in future long-term planning decisions as the Strategy is reviewed.

The drought response plan will also set specific triggers to start building infrastructure, based on detailed technical investigations. These triggers are likely to include preparatory work in advance of the 40 per cent trigger to commence drought response activities to enable completion of the projects within the assumed timeframe.

6.9.3 Local drought response planning

Drought response plans will be maintained for communities that are not physically connected to the SEQ Water Grid, including Kenilworth, Kilcoy, Linville, Jimna, Coominya and Canungra. These plans usually involve a combination of water efficiency measures and carting of water, as were implemented in Maleny and Canungra in late 2009.

The costs of implementing local drought response plans will be shared across all customers of the SEQ Water Grid.

Over time, the Strategy seeks to achieve the same security of supply for these communities as for those connected to the SEQ Water Grid, as explained in Section 6.5.

6.10 Strategy outcomes

An outcome of the Strategy is a list of actions that, if implemented, would deliver the Water Supply Guarantee. Table 6.4 provides an overview of the key elements of the Strategy and the likely outcomes.

Table 6.4 Key elements of the Strategy

Strategy	Outcomes
Implement LOS objectives	• Infrastructure is planned and operated to meet a regional urban water demand of 375 litres per person per day so that: – Medium Level Restrictions are expected to be required no more than once every 25 years, on average – Medium Level Restrictions are not expected to exceed six months' duration more than once every 50 years, on average – Medium Level Restrictions will require a reduction in demand of 15 per cent. • The system yield is increased by about 14 per cent, due to optimised use of all water sources and taking advantage of variable conditions across the region.
Efficient water use	• Water is used at least 24 per cent more efficiently compared to pre-drought trends, while the active, outdoor lifestyle that residents of SEQ enjoy is maintained. • Planning is based on a conservative assumption of average urban water consumption of 375 litres per person per day. • The community is encouraged to maintain average residential consumption at or below 200 litres per person per day (Target 200). • Business and industry is regulated to move towards best practice water use efficiency. • Urban water system losses are reduced from 14 per cent in 2005 to a target of 8 per cent. • Permanent Water Conservation Measures are introduced. • Power stations in the SEQ region use purified recycled water when taking water from the SEQ Water Grid. • The demand management program encourages efficient water use through an appropriate balance of structural, operational and behavioural measures.

Local supplies	• All new homes in SEQ meet mandatory water savings targets. Rainwater tanks and stormwater harvesting are options to meet the target. • Most new industrial and commercial buildings install alternative water supplies, potentially including a rainwater tank. • Higher savings are pursued where cost-effective, provided that community health and safety are maintained. • Water to top up pools is primarily sourced from a rainwater tank or downpipe rainwater diverter. • Increased recycling and increased capture of rainwater and stormwater contribute to the improved water quality of waterways and Moreton Bay.
Water balance	• Additional supplies could be required in 2021, depending on average consumption, population growth and the impact of climate change on the supply from dams and weirs. • Maintaining average residential consumption at 200 litres per person per day could defer the need for additional supplies by at least five years, to between 2027 and 2033. • The QWC will now undertake detailed planning to ensure that additional supplies can be delivered efficiently and when required. The planning investigations will inform a final decision regarding the preferred location, capacity and timing of future water supplies. • Further investigations will also be undertaken for a range of other potential sources of supply. • Priority desalination sites have been confirmed at Lytton and Marcoola. Reserve sites are at Tugun and Bribie Island. • Investigations to enable a decision on the preferred desalination sites, including a project plan for delivery as a drought response if required are continuing. It is anticipated that the preferred site will be identified in the 2011–12 financial year.
Drought response planning	• A drought response plan is prepared for future droughts. • Drought response plans are prepared for communities with stand-alone sources of supply.
Operating the SEQ Water Grid	• The SEQ System Operating Plan will direct water security, considering cost and a range of other factors including energy use. • Measures will be introduced to ensure that the SEQ Water Grid is managed in accordance with the *Australian Drinking Water Guidelines* and the *Australian Guidelines for Water Recycling*.
Groundwater	• Water from groundwater aquifers will continue to make a small contribution in the delivery of urban supplies. The sustainable take from these aquifers is expected to remain relatively static. • Over time, the overall take from regulated groundwater aquifers in the Warrill Creek and Lockyer Creek catchments is planned to be reduced to sustainable levels.
Rural communities	• Consistent LOS objectives are targeted across communities with reticulated drinking water. • Drought response plans will be prepared for communities that are not directly connected to the SEQ Water Grid. • About 180 000 residents of SEQ rely solely on water from rainwater tanks and groundwater aquifers. These residents will be able to access water from the SEQ Water Grid when required. • A policy position will be developed for providing reticulated drinking water to communities that rely on water from individual rainwater tanks and groundwater aquifers.
Rural production	• Additional supplies could potentially be made available from the SEQ Water Grid for rural production when not required to meet urban needs. • Up to 32 000 megalitres per year of purified recycled water has been made available to irrigators when not needed for urban supplies, subject to conditions. • Options to make supply of recycled water to the Lockyer Valley economically viable will continue to be investigated in detail. • Other recycled water schemes will be investigated, to increase production and reduce wastewater discharges to waterways and Moreton Bay. • Rural water use efficiency will continue to improve, driven by water markets and trading and other factors. • A rural water advisory group has been established to investigate actions for improving the security of water supply for rural production through SEQ Water Grid operation.

Integration with the Regional Plan	• Sub-regional total water cycle plans will be prepared for key development areas and where regionally significant water supply infrastructure is located. The purpose of these plans is to integrate land use planning with planning for waterway health and for water supply for urban and rural purposes. • A water-sensitive urban design approach will be adopted, whereby planning for water supply and sewerage is integrated with planning for stormwater management.
[illegible]mental [illegible]omes	• Environmental flows are maintained under water resource plans. • Using water efficiently will reduce the amount of energy used by the SEQ Water Grid. The savings are equivalent to the total energy consumption of around 67 000 homes in 2048, compared to pre-drought consumption trends. • Further energy will be saved in the distribution and wastewater system, and within buildings.
Flood mitigation	• New or raised dams will provide additional flood mitigation benefits.
Research and development	• Research and development programs will influence and support future water decision making by exploring new technologies and opportunities.
Implementation and review	• The QWC will monitor and report on the implementation of the Regional Water Security Program. • The Strategy will be reviewed at least every five years, in parallel with the Regional Plan, or as changes to key assumptions require. • The QWC will provide an annual report on key issues, progress on actions and a review of assumptions.

Chapter 7

Implementation and review

This chapter summarises the actions that will be undertaken in the short to medium term to implement the Strategy. It also explains the proposed timeframe for future reviews.

Key messages

- The Regional Water Security Program sets out the future planning actions to ensure ongoing water security for SEQ.
- The Strategy will form the basis of advice to the Minister for Natural Resources, Mines and Energy and Minister for Trade about the Regional Water Security Program.
- The QWC is responsible for monitoring, reviewing and reporting on the implementation of the Regional Water Security Program.
- A number of different agencies are responsible for implementing elements of the SEQ water planning framework.
- The Strategy will be reviewed at least once every five years, aligned with the SEQ Regional Plan.
- The QWC will report on implementation annually. The annual report will include an assessment on whether an earlier review may be appropriate.

7.1 Water planning framework

The Strategy is part of a suite of regional water policies that contribute to achieving the outcomes of the SEQ Regional Plan, as described in Figure 2.1. The Strategy will be implemented in conjunction with those policies and strategies.

To deliver the Water Supply Guarantee, a range of detailed plans must also be prepared, as described in Table 7.1. The scope of these plans varies from regional policies to detailed operational plans.

Before building future water infrastructure, detailed feasibility assessments are required to prove project viability and sustainability. All state and Commonwealth government statutory approvals must also be obtained.

The QWC will continue to refine the hydrologic modelling on which the Strategy is based, in partnership with the Department of Environment and Resource Management (DERM) and the Urban Water Security Research Alliance. In particular, the QWC will review and update the modelling as climate change science improves.

Table 7.1 SEQ water planning framework

	Elements	Responsibility
Regional scale	• Strategy	• QWC
	• Regional Water Security Program	• Minister to make program • QWC to provide advice and coordinate implementation
	• SEQ System Operating Plan	• QWC
	• Drought response plan	• QWC
	• SEQ Water Grid Quality Management Plan	• SEQ Water Grid Manager
	• Healthy Waterways Strategy	• Healthy Waterways Partnership
Sub-regional scale	• Water resource planning	• DERM
	• Sub-regional total water cycle planning	• QWC in partnership with key stakeholders
	• Detailed investigation of potential upgrades to the SEQ Water Grid, including potential sources of supply	• QWC in partnership with key stakeholders
	• Waterways and catchment planning	• DERM, Healthy Waterways Partnership, Seqwater and local governments
	• Distribution and wastewater planning	• Local governments and distributor-retailers

	Elements	Responsibility
Local government scale	• Planning schemes, including master plans	• Local government
	• Local total water cycle planning	• Local government
	• Distribution network planning	• Local governments and distributor-retailers
	• Wastewater network planning	• Local governments and distributor-retailers
	• Drinking water quality management plans and recycled water management plans	• SEQ Water Grid Manager and water service providers
On-site development scale	• Development assessment	• Local governments , with the involvement of other stakeholders, as appropriate
	• Water efficiency management plans	• Businesses

7.1.1 Regional Water Security Program

On 5 March 2010, a revised Regional Water Security Program was made. The Program was informed by the revised draft Strategy. It specifies LOS objectives and key projects to achieve water security for the region.

The QWC is responsible for ensuring that the key actions and responsibilities of Queensland Government departments and water service providers are carried out or complied with in delivering the Program.

Based on the final Strategy, the Minister may request that the QWC provide updated advice about revised regional water security options. Within four months of receiving the QWC advice, the Minister will make and publish a revised Program.

The QWC will monitor progress against the Program to ensure that water security continues to be achieved for the region.

7.1.2 Review and updating of the Strategy

In general, it is expected that the Strategy will be reviewed on a five-year cycle, aligned with the review of the Regional Plan. The next review of the Strategy may be undertaken earlier, depending on the rate and extent of rebound in demand following the introduction of Permanent Water Conservation Measures across SEQ.

Implementation and monitoring of the Strategy will be reported and published yearly through a report to the Minister, which is required under the SEQ Water Market Rules. Performance will be measured and reported against the activities, works and initiatives (listed in Table 7.3) that must be undertaken to achieve the goals of the Strategy and the underlying assumptions for determining the required LOS yield.

To ensure successful implementation of the Strategy, the monitoring program will include:

- implementing infrastructure against milestones and performance criteria
- continually analysing and assessing the water balance assumptions against population growth, economic development, climate impacts and regional water efficiency
- regularly reviewing and evaluating the SEQ Water Grid performance, seeking improved efficiencies and service delivery
- integrating outcomes from detailed investigations of demand management measures and potential sources of supply
- incorporating findings from the research and development program
- reviewing outcomes delivered through Strategy implementation.

Based on this assessment, the annual report may recommend that the next review of the Strategy be brought forward. This approach will guide further Strategy development and assist in ensuring that the Water Supply Guarantee can be achieved.

7.1.3 Stakeholder and community engagement

The QWC is committed to open, accountable and inclusive community engagement processes. The QWC will provide stakeholder organisations, individuals and interest groups with opportunities to influence water planning and management. Stakeholders and community groups will be consulted as part of detailed investigations of potential demand management measures and potential sources of supply.

A regional stakeholder group will be formed to provide input and advice on the implementation of the strategy and its review.

Figure 7.1 identifies the principle stakeholder organisations and interest groups.

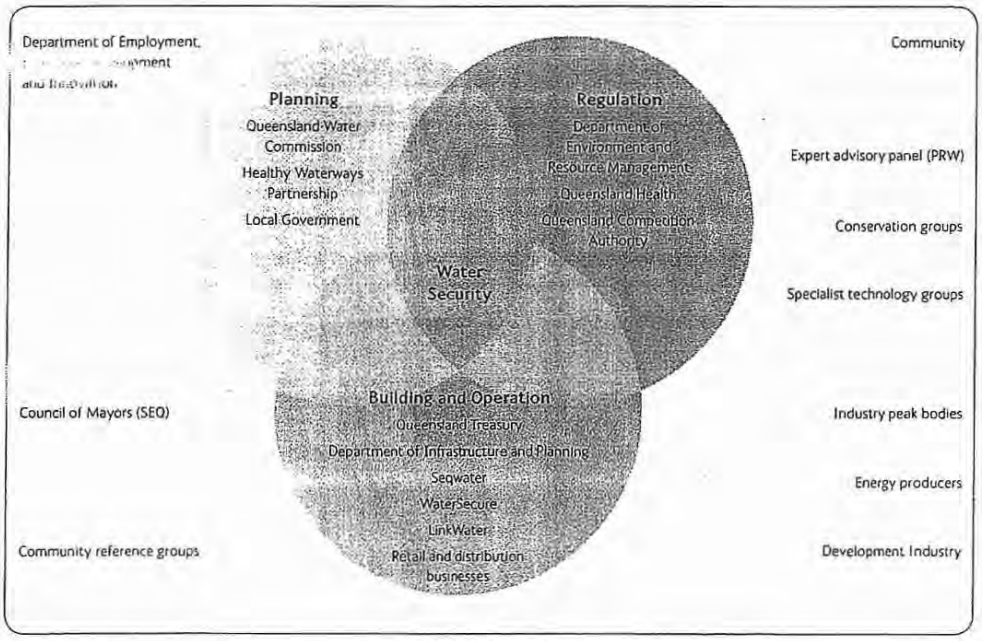


Figure 7.1 Strategy consultative framework

7.2 Efficient operation of the SEQ Water Grid

Water security is the first and foremost purpose of the SEQ Water Grid. A new framework has been established to ensure that this security is delivered as efficiently as possible, taking into account quality and reliability of service. Key features of the framework are:

- the SEQ System Operating Plan
- a detailed operating strategy
- an integrated water quality management framework.

7.2.1 SEQ System Operating Plan

The SEQ System Operating Plan outlines the rules for operating the SEQ Water Grid to help achieve the LOS objectives for the region, as specified in the Regional Water Security Program.

The SEQ System Operating Plan:

- facilitates water sharing across the region by specifying the share of available water that SEQ Water Grid customers may access
- establishes risk criteria for the short- and medium-term management of available water
- provides rules to promote the efficient and cost-effective operation of the SEQ Water Grid
- details minimum requirements, including for the production and supply of manufactured water
- ensures that operating costs are reduced, where possible, without compromising regional water security.

The risk criteria are a key feature of the SEQ System Operating Plan (refer to Table 7.2). The LOS objectives specify the basis for operating the SEQ Water Grid over the long term. The criteria provide the basis for balancing water security and operating costs over the short to medium term.

The risk criteria establish the acceptable levels of risk of triggering restrictions and construction of drought response infrastructure. Through these criteria, the SEQ System Operating Plan effectively mandates that the SEQ Water Grid be operated at capacity as key SEQ Water Grid storages approach 40 per cent of capacity. Under the current rules, it is it is estimated that full operation will be required below about 60 per cent of combined capacity, depending on the time of year and level of demand.

The risk criteria do not guarantee that the defined trigger levels will not be reached. However, they do ensure that potential operational changes to avoid them are taken as and when required.

Table 7.2 SEQ System Operating Plan risk criteria at March 2010

Volume of water stored by all key Water Grid storages	Probability of reaching stored volume		
	within 1 year	within 3 years	within 5 years
40 per cent	Less than 0.2 per cent	Not specified	Less than 5 per cent
30 per cent	Not specified	Less than 0.5 per cent	Less than 1 per cent

When the probability of reaching the trigger levels is less than the risk criteria, the SEQ Water Grid should be operated so as to minimise costs. Options include:

- reducing production from climate resilient supplies, such as desalination
- placing high-cost water treatment plants in standby mode
- reducing transfers through major interconnections
- selling water to irrigators on an interruptible basis (refer to Section 6.6).

The current risk criteria are conservative. They may be revised as new information becomes available on the efficient operation of the SEQ Water Grid and factors such as climate change.

7.2.2 Operating strategy

The SEQ System Operating Plan requires the SEQ Water Grid Manager to prepare an operating strategy outlining how the SEQ Water Grid will be operated.

The operating strategy must demonstrate how the LOS objectives and risk criteria are planned to be achieved as efficiently and effectively as possible. For example, it must address the amount of water that is expected to be taken from key supplies and the amount that is expected to be transferred through major interconnecting pipelines.

The SEQ Water Grid Manager will issue monthly Grid instructions based on the approved operating strategy. The operating strategy will focus on operation over a 12-month period. It will be submitted to the QWC for approval at 6-month intervals.

The operating strategy is based on overarching principles for various water supply assets. These principles include:

- ensuring compliance with resource operations plans and system operating rules
- maximising the use of more efficient supply options
- minimising the use of small, inefficient treatment plants, where an alternative exists
- maintaining minimum production levels at the desalination facility, ensuring that it is available when required
- maintaining minimum water flows through major inter-connectors, minimising the cost of operation and ensuring that they are available at short notice
- maintaining water quality from the Western Corridor Recycled Water Scheme in preparedness to augment Wivenhoe Dam as required.

The operation of the SEQ Water Grid is based on a robust risk management framework. This framework protects water security, quality and reliability by integrating operations across water supply entities. The SEQ Water Grid Manager has given specific consideration to:

- emergency management, ensuring business and service delivery continuity in the event of natural disasters or system failures
- security management, due to water supply being an essential community service
- risk management practices consistent across the seven entities in the supply chain.

7.2.3 Drinking water quality management

The SEQ Water Grid creates the opportunity to improve water quality management across the region by managing multiple treatment plants and potentially the blending of treated water. This is a significant change from the traditional approach where there is a dependency on individual water treatment plants.

Consistent with this approach, the quality of water delivered from the SEQ Water Grid will be assured through an integrated set of management plans for individual assets and across the Grid as a whole.

The SEQ Water Grid Manager manages the overarching water quality strategy through the Water Grid quality management plan. The aim of the quality management plan is to mitigate water quality risks and achieve water quality standards across the SEQ Water Grid as a whole.

Within this framework, each water service provider is required to prepare a drinking water quality management plan in accordance with the requirements in the *Water Supply (Safety and Reliability) Act 2008*. The regulations are being introduced in two stages. Providers are required to:

- carry out an initial mandatory monitoring and reporting program from 2 January 2009, until they have an approved drinking water quality management plan in place
- develop and implement the approved drinking water quality management plan.

In a drinking water quality management plan, the provider is required to:

- assess the risks in the system
- document the process for managing these risks
- outline operational requirements for managing the system, including how mandatory criteria will be monitored, how operational and verification monitoring will be conducted, and what reporting arrangements are in place to ensure safe water.

A recycled water management plan and drinking water quality management plan must be approved before purified recycled water is released into Wivenhoe Dam.

Rainwater tanks

Queensland Health does not recommend the use of water from rainwater tanks for drinking and food preparation if a potable reticulated water supply is available.

Many people in Queensland rely on water from rainwater tanks for their drinking water. Although the risk of contracting illness from these supplies is low when roof catchments and tanks are well maintained, the quality of water from rainwater tanks is not as consistently high as that provided by well-managed reticulated supplies that obtain their water from a high-quality source. The risks from using rainwater for potable purposes, including drinking and food preparation, can be managed through a risk management framework such as the one described in the 2004 enHealth Council document, *Guidance on use of rainwater tanks*.

Improvement program

Improvement programs will also be coordinated across the SEQ Water Grid. Upgrades may be undertaken as part of the renewal of existing infrastructure, or in response to increasing water quality standards or community expectations.

The OWC will coordinate regionally significant water quality improvements, through the Statement of Needs process described in Sections 3.5.2 and 7.3.

In partnership with the SEQ Water Grid Manager, the QWC will also coordinate periodic reviews of water quality standards and infrastructure. In 2010 and 2011, the QWC will review the costs and benefits of moving to a common residual disinfection standard across SEQ. The review will focus on disinfection by-products, residual maintenance, costs and operability and will inform planning for future water treatment plants and major upgrades to existing treatment plants.

Catchment management

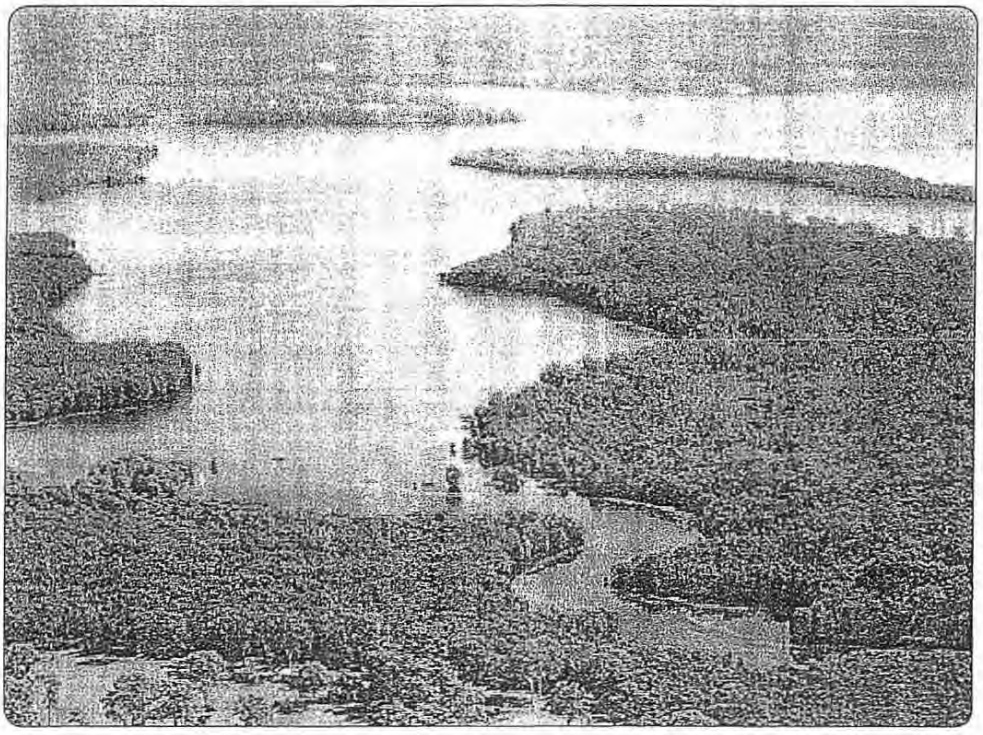
Catchment management is a core element of drinking water quality management. Existing uses need to be managed, and new development planned and assessed, to ensure that risks to water quality are controlled to an acceptable level. These controls need to be applied for all land from which water flows to drinking water supplies.

Local government planning schemes and related policies must identify these catchment areas and include appropriate development controls. Planning studies in these areas must consider how to avoid future types or scales of development that would pose an unacceptable risk to water quality. Where development is permitted, strict controls may be required. Infrastructure should also be located and designed taking into account water quality risks.

Administrative arrangements are being established to refer relevant development applications in dam catchments to Seqwater for consideration. Seqwater has prepared guidelines on how to address development in dam catchments.

In the longer term, Seqwater must have appropriate involvement in land use planning in dam catchment areas. Drinking water quality management plans will involve both planning and development assessment.

The QWC is reviewing current policy for managing the effect of land use and development in water storage catchments on drinking water quality. The purpose of the review is to ensure that arrangements can manage risks to drinking water quality. As an initial step, Seqwater has an assessment role for selected developments surrounding drinking water storages. The review will address the areas and activities that may need improved assessment and management arrangements to protect drinking water quality. Local governments are currently required, under the SEQ Regional Plan, to control the water quality impacts of all development in drinking water catchments.



7.3 Statement of Needs

The Statement of Needs will be based on the Strategy, and will summarise key activities that must proceed over the next ten years to ensure that the LOS objectives can be achieved (refer to Section 3.5.2). Based on the Strategy, the key elements of the first Statement of Needs will be as follows:

- Remaining committed projects in the Regional Water Security Program should be delivered. Timing and staging options should be considered, where applicable.
- Beyond these projects, additional bulk water supplies may be required as early as 2017. However, if SEQ is able to maintain regional average total water use at or below 345 litres per person per day, then new bulk water supplies may not be required until at least 2022.
- Operational improvements and capital upgrades to comply with water quality requirements under the *Water Supply (Safety and Reliability) Act 2008* should continue.
- A drought response plan should be prepared for the region and for towns with stand-alone sources of supply.
- Capital upgrades should be made over time to achieve the same level of service for stand-alone communities as for the remainder of the SEQ Water Grid.

7.4 Research and development

Applied research and development will improve the sustainable and integrated management of water in SEQ. This research will make significant contributions to reducing costs and environmental impacts, as well as improving planning and investment decisions.

7.4.1 Urban Water Security Research Alliance

The Urban Water Security Research Alliance (UWSRA) is the largest urban water research program in Australia. It was formed in 2007 as a partnership between the Queensland Government, the CSIRO, The University of Queensland and Griffith University. The partners have committed $50 million over five years.

The objective of the program is to collaboratively develop the knowledge and tools to inform and support the implementation of the Strategy. The program will address areas such as climate change, changes in technology and the introduction of purified recycled water. Research is being undertaken on three themes, with each theme involving a number of specific projects.

The themes are described in Table 7.3. Further information is available from the UWSRA website at <www.urbanwateralliance.org.au>.

Table 7.3 Projects comprising the Urban Water Security Research Alliance

Reducing demand	
Stormwater harvesting and reuse	Researching the innovative capture and storage of stormwater for additional water supply in SEQ. The impact of harvesting stormwater on creek and ecosystem health is also being investigated.
Decentralised systems	Researching the performance and reliability of rainwater tanks and decentralised water supply systems in residential and commercial developments, including energy use and water quality standards.
Demand management and communication research	Researching community attitudes and behaviour in relation to demand management.
Residential water end-use	A detailed survey into household water end-uses that will quantify the impact of urban water demand management strategies.

Water quality	
Hospital wastewater	Researching the contribution of pharmaceutical and other compounds to domestic wastewater from hospitals.
Pathogens and trace contaminants in dams	Researching sources of target pathogens and organic chemicals and the treatment capacities of dams to remove them under different climatic and seasonal conditions in SEQ.
Bio-assays and risk communication	Development of scientific, technical and communication bases for the implementation of bio-analytical tools in water quality monitoring programs.
Health risk assessment of local source waters	Researching the survival, and removal, of pathogens in rainwater tanks and stormwater.
Enhanced treatment	Evaluating alternative treatment processes that may be able to achieve similar water qualities and risk profiles as the micro-filtration and reverse osmosis process used for purified recycled water.
Disinfection by-product formation in alternative source waters	Researching disinfection by-product formation from blending treated drinking water of different qualities from different sources within the SEQ Water Grid.
Electrochemical treatment of reverse osmosis concentrate	Supporting research into the efficiency of electrochemical treatment of reverse osmosis concentrate to remove total organic carbon, chemical oxygen demand and dissolved organic nitrogen.
Managing efficiently	
Climate and water	Through the use of modelling, this project is examining how the climate has changed, what the key drivers are, and the regional implications for water resources.
Total water cycle analysis	Evaluating the impact of rainwater tanks, recycling, stormwater harvesting and sub-regional scale water cycle plans on the water balance at the regional scale.
Water quality monitoring technology and information collection	Developing systems for online, real-time monitoring of water quality in sewage systems. A proof-of-concept system has been developed to monitor inflows to wastewater treatment plants, providing the capacity to detect sudden changes.
Evaporation losses from water storages	Assessing the reduction in evaporation that can be achieved through the use of mono-layers and the potential impacts of these mono-layers on water quality and ecology.
Purified recycled water in the Lockyer Valley	Evaluating the impacts on soil quality of delivering recycled water to the Lockyer Valley for irrigation.

7.4.2 Water Cycle Sciences Project

The multidisciplinary Water Cycle Sciences Project is another key element of water research in SEQ. Managed by DERM, the project has a focus on identifying the barriers and solutions to achieving a sustainable long-term water cycle.

7.4.3 Queensland Climate Change Centre of Excellence

In March 2007, the Queensland Government established the Queensland Climate Change Centre of Excellence as a specialist unit within DERM. The Centre provides policy advice and scientific information on climate change and its impact on the community, economy and environment. The Centre has formed links with national and international researchers to ensure that Queensland benefits from global research on climate change, as well as having strong links with national policy initiatives. At the same time, that knowledge will be applied at a regional level so that the local climate change impacts can be assessed and managed.

7.5 Key actions

Table 7.4 summarises the activities, works and initiatives that the QWC considers should be undertaken over the next 10 years to achieve the goals of the Strategy.

The activities are additional to:

- existing measures, such as the demand management program
- committed projects, such as those listed in the Emergency Regulation
- legislative and regulatory requirements, such as the preparation of drinking water quality management plans
- requirements under the SEQ System Operating Plan and market rules, including the development of a SEQ Water Grid operating strategy.

Table 7.4 **Recommended planning activities and initiatives**

Number	Section reference	Activity, work or initiative	Timeframe	Responsible agency
Total water cycle planning				
1	2.3	Finalise the Mt Lindesay and Beaudesert sub-regional total water cycle management plan.	Short-term	QWC in partnership with key stakeholders
2	2.3	Prepare sub-regional total water cycle management plans for key development areas, including in the Moreton Bay and Sunshine Coast Regional Council areas.	Medium-term	QWC in partnership with key stakeholders
3	2.3	Prepare and publish a guideline for sub-regional and local total water cycle planning.	Medium-term	QWC in partnership with DERM and local governments
Strategy review and implementation				
4	3.5 and 7.1.1	Provide updated regional water security options to the Minister based on the key elements of the Strategy.	By the end of 2010	QWC
5	3.5 and 7.1.1	Report on the status of the implementation of the Regional Water Security Program.	Annually	QWC
6	3.5 and 7.1.2	Publicly report on the implementation of the Strategy and currency of key assumptions.	Annually	QWC
7	3.5	Develop a triple bottom line assessment framework for potential demand management measures and potential water supplies.	Short-term	QWC
8	7.1.3	Establish an expert stakeholder forum to discuss issues associated with the implementation of the Strategy—as a priority.	Short-term	QWC
9	3.5	Review the Strategy as required, and prior to a decision regarding the next major supply.	At least once every five years, aligned with the Regional Plan	QWC
Drought response planning				
10	6.5.1	Finalise drought response plans for towns with stand-alone sources of supply.	Short-term	QWC
11	6.9	Prepare a drought response plan for the SEQ Water Grid in accordance with legislative requirements.	Medium-term	QWC
Demand and supply modelling				
12	3.2 and 5.3.2	Undertake further hydrologic modelling to better address the potential impact of climate change on inflows of major dams.	Medium-term	UWSRA, QWC and DERM
13	7.1.2	Publish an annual water report, summarising key consumption and demand trends in SEQ.	Annually	QWC
[illegible]	7.1.2	Monitor and analyse consumption and demand trends, and review and refine future demand forecasts as appropriate.	Ongoing basis	QWC

Number	Section reference	Activity, work or initiative	Timeframe	Responsible agency
Demand management program				
15	6.2	Deliver information and education campaigns related to efficient water use and Target 200, including through the development and delivery of targeted education programs for schools and selected industries.	Ongoing	QWC, DERM and Seqwater
16	6.3.1	Review the efficiency and effectiveness of the existing Permanent Water Conservation Measures. Investigate whether individual measures can be integrated into end-user contracts, moved to other regulations, or discontinued.	2010 and 2011	QWC, distributor-retailers and other stakeholders
17	6.3.3	Review the overall demand management program to ensure that it continues to achieve an appropriate balance between water restrictions and other demand management measures, with the objective of encouraging water efficiency at the lowest possible economic, social and environmental costs.	Ongoing	QWC
18	4.4 and 6.3	Develop an online reporting facility and templates for businesses with water efficiency management plans.	Short-term	QWC
19	6.3.2	Work with the Commonwealth and other jurisdictions to develop a national approach to water efficiency for large water users, potentially including a star-rating system.	Long-term	QWC and DERM
20	6.3.2	Work with the Commonwealth Government to promote the Water Efficiency Labelling Scheme and ban the sale of appliances that do not meet these requirements.	Ongoing	QWC and DERM
21	6.3.2	Assess viability and trial the use of web-based water monitoring systems to detect leaks within schools.	Long-term	QWC and Department of Education and Training
22	6.3.2	Implement standardised water billing requirements across SEQ.	Commencing July 2010	Distributor-retailers
23	6.3.3	Undertake a comprehensive review of the potential demand management measures.	As part of future reviews of the Strategy	QWC
24	4.5	Review medium- to long-term non-residential demand forecasts based on updated development and water use trends.	Medium-term	QWC and distributor-retailers
25	4.3	Undertake a detailed review of system leakage targets for bulk and distribution infrastructure using the Infrastructure Leakage Index approach.	Long-term	QWC, LinkWater and distributor-retailers
26	4.3	Review peaking factors recommended in the Planning Guidelines for Water Supply and Sewerage based on the planning assumption for average total consumption, with allowance for local demand and supplies.	Medium-term	QWC and DERM

Number	Section reference	Activity, work or initiative	Timeframe	Responsible agency
Local supplies				
27	4.6	Research options to enhance the efficiency of the water saving target acceptable solutions, including by increasing the average yield, cost-effectiveness or energy efficiency.	Ongoing basis	QWC, Department of Infrastructure and Planning and the UWSRA
28	4.6	Quantify and assess the performance and reliability of rainwater tanks in residential and commercial developments, including the costs and benefits of larger tanks.	Medium-term	QWC and UWSRA
29	4.6	Research the survival and removal of pathogens in rainwater tanks and stormwater.	Long-term	QWC, UWSRA and Queensland Health
30	4.6 and 5.4.3	Investigate opportunities to use stormwater to safely and efficiently provide alternative water supplies. Potential impacts on environmental flows and the benefits of water-sensitive urban design in removing contaminants of concern will also be investigated.	Medium-term	QWC and the UWSRA
31	4.6	Facilitate the development of major stormwater harvesting demonstration projects that achieve the water saving target through supply to toilet cisterns and washing machines.	Medium-term	QWC with local governments and developers
32	4.6	Deliver an education program for local governments and developers regarding options to achieve the water saving target.	Medium-term	QWC
33	4.4	Research into community attitudes and behaviour in relation to demand management.	Medium-term	UWSRA and QWC
Committed projects				
34	5.1	Complete remaining Emergency Regulation projects.	As specified in the Emergency Regulation	Responsible entities
35	5.2	Construct the first stage of the Wyaralong water treatment plant and Cedar Grove Connector.	Medium- to long-term (to be based on QWC's recommendation)	Department of Infrastructure and Planning
36	5.2	Construction the second stage of the Wyaralong water treatment plant and Karawatha Inter-connector.	Medium- to long-term (based on QWC's recommendation)	Department of Infrastructure and Planning
Potential desalination facilities				
37	5.4.1	Preserve priority sites at Marcoola and Lytton and reserve sites at Bribie Island and at Tugun.	Short-term	QWC
38	5.4.1	Establish community reference groups and consultation programs for investigations of priority sites. Conduct community consultation on the Phase 3 investigation work at and surrounding the priority sites.	Short-term	QWC
39	5.4.1	Prepare a land use master plan for land surrounding the existing SEQ (Gold Coast) Desalination Facility as a priority to enable coordination of planning activities for a range of different uses in the area.	Short-term	Gold Coast City Council and the QWC
40	5.4.1	Identify and preserve pipeline corridors required to connect priority sites to the SEQ Water Grid and to augment the Water Grid as required.	Medium-term	LinkWater

Number	Section reference	Activity, work or initiative	Timeframe	Responsible agency
41	5.4.1	Undertake detailed engineering investigations at priority sites to investigate such issues as ground conditions and flooding risk to provide input into the design and approvals processes.	Medium-term	QWC
42	5.4.1	Undertake detailed investigations into the composition and condition of flora and fauna communities in Moreton Bay in order to establish a baseline condition of potentially affected marine ecosystems.	Medium-term	QWC and SEQ Healthy Waterways Partnership
43	5.4.1	Commence appropriate water quality monitoring for priority sites to establish baseline seawater conditions.	Medium-term	QWC and SEQ Healthy Waterways Partnership
44	5.4.1	Through the SEQ Healthy Waterways Partnership, develop an advanced three-dimensional receiving water quality model to investigate potential effects of brine dispersion.	Medium-term	QWC and SEQ Healthy Waterways Partnership
45	5.4.1	Commence ecological investigations at priority sites and adjoining areas to confirm the presence of any native habitats and any significant environmental values not yet identified.	Medium-term	QWC
46	5.4.1	Compile a review of environmental factors, which could constitute a project referral document for referral of a proposed new desalination plant to the Commonwealth environmental regulator.	Medium-term	QWC, LinkWater and Watersecure
47	5.4.1	Based on the investigations outlined above, develop a business case for the development of additional desalination capacity as a future bulk water supply source.	Medium-term	QWC
Potential dams and weirs				
48	5.4.2	Undertake a detailed investigation of the option to further raise Borumba Dam and the potential of water harvesting from the Upper Mary River to the dam.	Short-term	QWC, DERM and local government
49	5.4.2	Undertake a detailed investigation of options to increase supply from the Logan Basin, including by development of a small storage on the Glendower Dam site or by a pipeline to transfer water from the Bromelton Off-stream Storage to Wyaralong Dam.	Medium-term	QWC
50	5.4.2	Review the operation of the Brisbane River system to optimise the water supply yield and balance flood storage and water supply storage volume requirements.	Medium-term	QWC and Seqwater
51	5.4.2	Review the potential to water harvest from Gold Coast creeks and the Coomera River into Hinze Dam.	Long-term	QWC
Stormwater harvesting to dams				
52	5.4.3	Investigate opportunities to use stormwater to augment dams, including a scheme to augment Ewen Maddock Dam.	Medium-term	QWC, local government, Unitywater and Seqwater

Number	Section reference	Activity, work or initiative	Timeframe	Responsible agency
Purified recycled water				
53	5.4.4	Enhance community access to information regarding purified recycled water, including in relation to water quality, environmental benefits and the role of the Western Corridor Recycled Water Scheme as a standby facility with the capacity to supplement Wivenhoe Dam at appropriate times.	Ongoing	WaterSecure
54	5.4.4	Publish water quality reports for the Western Corridor Recycled Water Scheme.	At least annually	WaterSecure
55	5.4.4	Develop a strategy to maximise cost-effective supply of purified recycled water to existing and future industrial users.	Short-term	SEQ Water Grid Manager and QWC
56	5.4.4	Investigate options to increase treated effluent flows to the Gibson Island advanced water treatment plant, as a drought response measure or normal operating practice.	Medium-term	QWC with distributor-retailers
57	5.4.4	Investigate projected wastewater volumes available for supply, and potential viable sources of demand, as well as ecosystem consequences of wastewater discharge and recycling options.	Medium-term	QWC with distributor-retailers
58	5.4.4	Investigate potential purified recycled water schemes to augment Hinze Dam and North Pine Dam.	Long-term	QWC
59	5.4.4	Commence baseline hydrodynamic and water quality monitoring on Hinze and North Pine dams, informed by detailed investigations.	Long-term	Seqwater
Rural towns				
60	6.5.1	Recommend options to improve water security for Beaudesert and Canungra.	Short-term	QWC
61	6.5.1	Investigate water security options for other towns with a stand-alone source of supply, including Dayboro and Boonah.	Medium-term	QWC
62	6.5.2	Review minimum requirements regarding rainwater tank capacity and connected roof area where reticulated drinking water supplies are not available.	Medium-term	QWC
63	6.5.2	Investigate the volumes of water required to augment supply from rainwater tanks during drought, where reticulated drinking water supplies are not available.	Medium-term	QWC and distributor-retailers
64	6.5.2	Develop a policy position regarding the provision of reticulated water supplies to communities that currently rely on drinking water from rainwater tanks and groundwater bores.	Long-term	QWC, distributor-retailers and local governments
Rural production				
65	6.6	Establish a rural water advisory group to oversee planning for rural water supply initiatives in SEQ.	Short-term	QWC
66	6.6.2 and 6.6.3	Develop a framework, including pricing policies, to make additional water available for rural production, when not required for urban supply.	Short-term	QWC, DERM, SEQ Water Grid Manager and Seqwater

Number	Section reference	Activity, work or initiative	Timeframe	Responsible agency
67	6.6.2	Undertake a survey of existing rural producers in partnership with the rural water advisory group and local governments to establish whether existing entitlements meet local needs.	2010	QWC, DERM and local governments
68	6.6.2	In the Warrill Valley, investigate an option to enhance the reliability of supply to rural irrigators through an amendment to the interim resource operations licence.	Short-term	QWC and Seqwater
69	6.6.2	Investigate opportunities to make additional SEQ Water Grid water available for rural production, when not required for urban supply.	Medium-term	QWC and SEQ Water Grid Manager
70	6.6.3	Investigate alternative schemes to make the supply of recycled water from the Western Corridor Recycled Water Scheme to the Lockyer Valley economically viable, including options involving use of existing infrastructure and, if necessary, a reduction in the irrigation area.	Short-term	SEQ Water Grid Manager, QWC and DERM
71	6.6.3	Investigate opportunities to supply recycled water for rural irrigation, including as part of sub-regional total water cycle planning.	Medium-term	QWC, distributor-retailers and local governments
Supply to outside SEQ				
72	6.7	Develop a framework for the supply of water to areas outside SEQ, on a full commercial basis and without impacting on the ability to deliver LOS reliability to SEQ. The framework should include economic and operational principles, standard contractual provisions and possible inter-governmental agreements.	Short-term	QWC
System operation				
73	7.2.1	Review the SEQ System Operating Plan as required.	As required	QWC
74	7.1.2	Report annually to the Minister on the operation of the SEQ Water Grid, as part of the annual market rules review.	No later than 30 November each year or by such other time as the Minister may determine	QWC
75	7.2.3	Review the costs and benefits of moving to a common residual disinfection standard across SEQ.	Short-term	QWC with water service providers
76	7.2.3	Implement appropriate development controls in the catchment area of Cedar Grove Weir, while preserving appropriate development rights.	Medium-term	QWC and Scenic Rim Regional Council
77	7.2.3	Develop a policy approach on catchment management controls for management of water quality risks in dam catchments.	Medium-term	QWC, DERM and Seqwater
78	7.2.3	Participate in future planning scheme reviews and in the development assessment process as a concurrence agency.	Ongoing	Seqwater

Number	Section reference	Activity, work or initiative	Timeframe	Responsible agency
Other research				
79	7.4	Quantify residential water end-uses and develop options for target interventions to improve water use efficiency.	Medium-term	UWSRA and QWC
[illegible]	[illegible]	Research opportunities to further improve the quality of purified recycled water through source control, wastewater treatment technologies and management within natural water bodies.	Medium-term	UWSRA and WaterSecure
81	7.4	Research sources of target pathogens and organic chemicals and the treatment capacities of dams to remove them under different climatic and seasonal conditions in SEQ.	Medium-term	UWSRA and Seqwater
82	7.4	Evaluate alternative treatment processes that may be able to achieve similar water qualities and risk profiles as the micro-filtration and reverse osmosis process used for purified recycled water.	Medium-term	UWSRA
83	7.4	Research disinfection by-product formation from blending treated drinking water of different qualities from different sources within the SEQ Water Grid.	Medium-term	UWSRA, QWC and Seqwater
84	7.4	Research and evaluate options to reduce evaporation from dams.	Medium-term	UWSRA and DERM

Key terms

Term	Definition
Allocation	A right to take water that is an asset separate from land title and can be traded. Water allocations are generally granted via processes contained within resource operations plans.
Brisbane River system	Wivenhoe and Somerset dams, Lake Manchester, Gold Creek Dam and the Mt Crosby Weir.
Bulk water price path	Ten-year price path projected for bulk water prices based on assumed interest rates and consumption patterns.
Category A water	Category A water is supplied from the SEQ Water Grid at the reliability specified in the LOS objectives. Category A water is used for high priority uses including for urban and some industrial purposes. It includes purified recycled water that is supplied to power stations and those industrial customers that require LOS reliability.
Category B water	Category B water is supplied from the SEQ Water Grid at a lower reliability than that specified in the LOS objectives. Category B water includes purified recycled water that is available from the Western Corridor Recycled Water Scheme for rural irrigation. These supplies will be used to augment Wivenhoe Dam if SEQ Water Grid storage levels decline to 40 per cent of capacity.
Climate independent supply	Climate independent water supplies are not affected by rainfall or inflow patterns. Water from desalination and artesian water are examples of climate independent supplies.
Climate resilient supply	Climate resilient supplies are not likely to be significantly affected by climate variability. Such supplies include: - climate independent supplies, such as desalination - purified recycled water - adopted net inflows to dams and extractions from groundwater aquifers under extended and severe drought conditions. For the Strategy, the climate resilient supply from dams and weirs across SEQ is based on 30 months of inflows equivalent to a drought with a severity of between one in 1000 and one in 10 000 year occurrence, adjusted for evaporation and river transport losses.
Demand management	Any program that reduces water consumption and the demand for water from the region's bulk water sources. Demand management programs may include water use efficiency measures, reductions in water losses, water trading to make better use of existing supplies, and substitution of existing supplies with alternative supplies such as rainwater tanks, recycled water and stormwater.
DERM	Department of Environment and Resource Management.
Destination price point	Under the water price path, councils will reach the final price point at different times, reflecting the fact that councils have different bulk water costs at present. Once the final price point is reached, bulk water increases should only be based on inflation. The years in which the relevant councils reach the final destination price point are: - Lockyer: 2011-12 - Somerset: 2014-15 - Scenic Rim: 2015-16 - Logan: 2015-16 - Gold Coast: 2016-17 - Brisbane, Ipswich, Moreton Bay, Sunshine Coast and Redlands: 2017-18.
DIP	Department of Infrastructure and Planning.
Drought response mode	The mode of operation when the combined regional storage levels drop below the T1 trigger and enter the regional Drought Storage Reserve. This mode has two phases – the preparation phase and the construction phase.
Drought response plan	A pre-determined suite of restrictions, demand management programs and new sources of supply that will be implemented once combined dam levels reach a specified trigger.
Drought storage reserve	Volume of water located below the working storage. The SEQ Water Grid drought storage reserve is sized to provide, in conjunction with climate resilient sources, a minimum of 36 months supply of water at a restricted demand.
Effective evaporation	Losses due to surface evaporation and seepage minus infiltration.
Emergency Regulation	*Water Regulation 2002* (Part 8)

Term	Definition
Entitlement	A term used to describe some water authorities granted under the *Water Act 2000*. A water entitlement is a water allocation, interim water allocation or a water licence.
Environmental flows	Flow requirements specified in Water Resource Plans necessary to maintain and support aquatic biota and ecosystem processes.
Federation Drought	The drought experienced in SEQ from 1898 to 1903. Prior to the Millennium Drought, it was the most severe drought in recorded history in SEQ.
Greywater	Wastewater from the bath, spa bath, shower, wash basins and laundry, which can be diverted for use on lawns and gardens. It does not include water from the kitchen, swimming pool or toilet, as this water would pose health and environmental risks.
Grid Water	Any water supplied into or extracted from the SEQ Water Grid.
Groundwater	Groundwater, as defined in the Water Regulation 2002, is water from an underground source.
Key Water Grid storages	Baroon Pocket, Ewen Maddock, Cooloolabin, Wappa, Somerset, Wivenhoe, North Pine, Leslie Harrison, Hinze and Little Nerang dams and Lakes McDonald and Kurwongbah. Key Water Grid storages are used to calculate current dam levels and critical drought response triggers.
Levelised cost	The cost of a measure expressed in terms of dollars per megalitre. Levelised cost is generally calculated by dividing the net present value of the cost of the measure by the net present value of the water saved or supplied.
Level of Service (LOS) objectives	LOS objectives provide a basis for establishing a secure water supply. The objectives define inter alia the desirable maximum frequency, duration and severity of water restrictions, and the average amount of water per capita that must be supplied in normal times. For the purposes of the Strategy, LOS objectives are the same as 'desired Level of Service objectives' as defined in the *Water Act 2000*.
L/p/d	Litres per person per day.
LOS system yield	The LOS system yield is the volume of water that can be supplied from the SEQ Water Grid, on average every year and still achieve the LOS objectives.
Logan River system	Wyaralong Dam, Cedar Grove Weir, Bromelton Off-stream Storage and Maroon Dam.
ML	A megalitre or 1 000 000 litres.
ML/yr	Megalitres per year.
Measures	Used to describe initiatives or projects which are expected to achieve a defined outcome.
Millennium Drought	The drought that occurred in SEQ (and other parts of Australia) from 2001 until 2009. The Millennium Drought was declared over in SEQ on 20 May 2009 when Wivenhoe, Somerset and North Pine dams reached 60 per cent of their combined capacities.
Minimum operating level	The minimum operating volume for any storage is included in the appropriate resource operations plan and might be referred to as the dead storage level. Water below the minimum operating level cannot be accessed with existing infrastructure.
Minimum security volume	The minimum security volume is set at 5 per cent by the LOS objective that regional water storages must not be permitted to reach 5 per cent of combined storage capacity.
Normal operating mode	This is the mode of operation when the combined regional water storage level is within the working storage. Most commonly, the region will operate in this mode.
Priority	Groups of water allocations and interim water allocations are assigned a priority, largely based on the performance of the groups and the rules in place to provide for the sharing of available water between the priority groups. High priority A group of water allocations and interim water allocations that perform more reliably than lesser priority groups. High priority water allocations are mainly used for urban purposes and for power generation, although they are also sometimes utilised for irrigation. Medium priority A group of water allocations or interim water allocations that have less security than high priority. Once the available water in a scheme has been set aside for the high priority group, the remainder is divided amongst those in the medium priority group. Access to medium priority water is often prohibited before access to higher priority water begins to reduce. Medium priority allocations are generally used in the rural production sector.
Purified recycled water (PRW)	Purified recycled water is wastewater that has been treated to a very high standard using world's best technology through an advanced water treatment process. The Public Health Regulation 2005 and the *Water quality guidelines for recycled water schemes* specify the water quality standards that must be met for recycled water and drinking water.

Term	Definition
Queensland Water Commission (QWC)	A statutory authority established to advise the Queensland Government on matters relating to water supply and demand management, and to facilitate and implement the regional water security program.
Regional water security options	Advice from the QWC regarding options to achieve water security in SEQ. Among other things, the options must address: • LOS objectives • demand management for water • the extent to which implementation of the desired LOS objectives would involve modifying existing water supply works or building new water supply works • the likely costs and pricing implications and the preferred ways of sharing the cost.
Regional water security program	A program to achieve water security for the region made and published by the Minister for Natural Resources, Mines and Energy and Minister for Trade within four months of receiving regional water security options from the QWC. A revised regional water security program was made in March 2010.
Reliability of supply	An indication of the proportion of time that a supply system is able to meet the full assumed demand. Reliability may be expressed as the proportion of time over a historical period that the full demand is met or conversely not met.
Resource operating plan (ROP)	A plan that details the water sharing rules, infrastructure operating rules and other water management rules that will be applied in the day-to-day management of water supplies within a catchment or water supply scheme.
Restricted demand	The volume of water required to meet the region's needs if the combined regional storage drops below the T1 trigger. The LOS objective for Medium Level Restrictions is to reduce demand by 15 per cent below the demand when Permanent Water Conservation Measures are in force. See also Water Restrictions.
Regional Plan	*South East Queensland Regional Plan 2009-2031.*
SEQ	South East Queensland, as defined in the SEQ Regional Plan.
SEQ Water Grid	The connected group of bulk supply and transport assets in South East Queensland that when operated conjunctively can deliver the LOS objectives.
SEQ Water Grid Manager	A Government owned, not for profit, entity established to purchase bulk supply, treatment and transport services, sell water and water services to Water Grid customers, and oversee the physical operation of the SEQ Water Grid.
Sewer mining	The extraction of raw sewage effluent from the wastewater collection system for treatment and use as recycled water. Waste from the treatment plant is generally returned to the sewer. The final quality of the water produced can be fit to purpose.
South Maroochy system	Cooloolabin, Poona and Wappa dams.
Standards of service	The characteristics of product delivered by water retailers to their customers. The *Water Act 2000* describes the requirements for establishing standards of service. Examples of standards of service relate to water quality, delivery pressure and continuity of supply.
Stochastic modelling	A stochastic model is a tool for estimating probability distribution of potential outcomes by allowing for random variation in one or more inputs over time. The random variation is usually based on fluctuations observed in historical data for a selected period using standard time-series techniques.
System losses	The difference between the amount of water extracted from water supplies and that delivered to water users. The difference may be due to approved activities such as fire fighting or unapproved such as theft or due to leakage losses.
SEQ System Operating Plan	A plan made under section 360V of the *Water Act 2000* to give effect to the regional water security program. The SEQ System Operating Plan describes rules for operating water supply infrastructure in order to achieve the LOS objectives, as specified in the regional water security program.
Urban activity	A residential, industrial, retail, commercial, sporting, recreation, tourism or community activity within the urban footprint.
Urban footprint	One of the regional land use categories in the Regional Plan. The urban footprint identifies land to provide for the region's urban development needs to 2031.
Waterhub	The SEQ water accounting framework managed by the Queensland Water Commission.
Water harvesting	The taking of unsupplemented water during high flow events. Water harvesting generally involves extraction of water when set flow thresholds are exceeded and pumping and storing the water off-stream for later use.

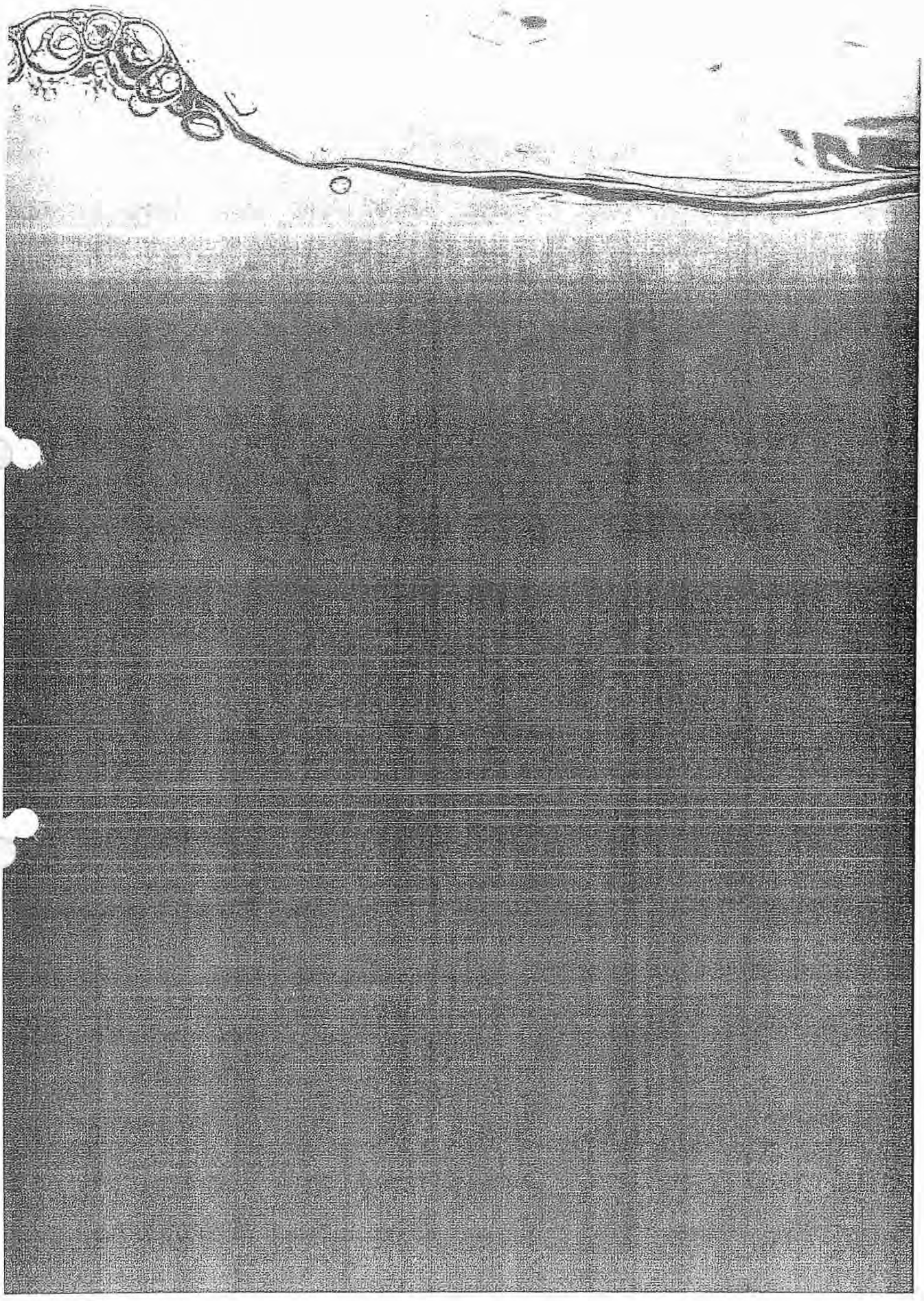
Term	Definition
Water resource plan (WRP)	Subordinate legislation under the *Water Act 2000* that provides the framework for defining the balance between water for consumptive use and environmental requirements. These plans also provide the basis for establishing tradable water allocations including the specification of: • water allocation security objectives (WASOs) • environmental flow objectives (EFOs).
Water restrictions	Permanent Water Conservation Measures Permanent low level restrictions that will be introduced across SEQ. Medium Level Water Restrictions Initiatives that form part of the drought response plan to reduce demand for SEQ Grid Water by 15 per cent.
Western Corridor Recycled Water Scheme (WCRWS)	Waste water treatment and recycling project that manufactures drought resilient water supplies for emergency use (when the combined volume of SEQ storages falls below 40 per cent of capacity. The project includes: • more than 200 kilometres of large-diameter underground pipeline, reaching from Luggage Point on Brisbane's east to Caboonbah north-west of Ipswich • three advanced water treatment plants at Bundamba, Luggage Point and Gibson Island • the capacity to supply up to 232 million litres of purified recycled water per day When not required for emergency water supply, the WCRWS supplies purified recycled water to power stations
Water year	An annual cycle associated with the natural progression of the hydrologic seasons. It is intended to commence with the start of the season of soil moisture recharge, includes the season of maximum run-off, stream flows and groundwater recharge and concludes with the season of maximum evapo-transpiration. In SEQ, it is generally described as the period 1 June to 31 May but does vary from catchment to catchment.
Working storage	The portion of a dam or weir above the drought storage reserve that is drawn upon in normal operating mode.
Yield	The average annual volume that can be drawn from a supply source or a supply option to meet a specified demand at a specified probability of occurrence. Historical no failure yield (HNFY) The maximum amount that, if it had been extracted in each year for which flow data exists, the storage would not have reached minimum operating level. That is, extraction of the HNFY every year would not cause the dam to be drawn down below the dead storage level during the worst drought on record. This approach does not accommodate a drought worse than the worst drought on record. LOS yield The yield of a dam, weir or other water storage to achieve the LOS objectives. LOS system yield The yield that can be supplied from a system, such as the SEQ Water Grid, on average every year and still achieve the LOS objectives.

Reference List

The following documents have informed the development of the Strategy. The Strategy also drew on a range of technical reports that have been published on the QWC website.

Title	Website
Regional planning framework	
South East Queensland Regional Plan 2009-2031	http://www.dip.qld.gov.au/regional-planning/regional-plan-2009-2031.html
South East Queensland: Infrastructure Plan and Program 2007-2026	http://www.dip.qld.gov.au/regional-planning/south-east-queensland-infrastructure-plan-and-program.html
Our Water – Urban Water Supply Arrangements in South East Queensland May 2007	http://www.qwc.qld.gov.au/Urban+Water+Supply+Arrangements+Report
Planning, Information and Forecasting Unit (PIFU), Population and Housing Fact Sheet for SEQ Region	http://www.oesr.qld.gov.au/queensland-by-theme/demography/population-characteristics/profiles/pop-housing-fact-sheets-reg-planning/pop-housing-fact-sheets-south-east-qld-200908.pdf
Queensland Government Population Projections to 2051: Queensland and Statistical Divisions 2008 Edition	http://www.oesr.qld.gov.au/queensland-by-theme/demography/population/tables/pop-proj/proj-pop-sd-qld/index.shtml
Improving water use efficiency in Queensland urban communities Nov 2000	http://www.derm.qld.gov.au/publications/water_management.html
Related legislation	
Water Act 2000	http://www.legislation.qld.gov.au/LEGISLTN/CURRENT/W/WaterA00.pdf
Water Supply (Safety and Reliability) Act 2008	http://www.legislation.qld.gov.au/LEGISLTN/CURRENT/S/SouthEQWA07.pdf
Water Regulation 2002	http://www.legislation.qld.gov.au/LEGISLTN/CURRENT/W/WaterR02.pdf
South East Queensland Water (Restructuring) Act 2007	http://www.legislation.qld.gov.au/LEGISLTN/CURRENT/S/SouthEQWA07.pdf
Sustainable Planning Act 2009	http://www.legislation.qld.gov.au/LEGISLTN/CURRENT/S/SustPlanA09.pdf
Queensland Development Code 2003	http://www.dip.qld.gov.au/building/queensland-development-code.html
Water resource plans	
Gold Coast	http://www.legislation.qld.gov.au/LEGISLTN/CURRENT/W/WatResGCP06.pdf
Logan Basin	http://www.legislation.qld.gov.au/LEGISLTN/CURRENT/W/WatResLBP07.pdf
Mary Basin	http://www.legislation.qld.gov.au/LEGISLTN/CURRENT/W/WaterReMaryP06.pdf
Moreton	http://www.legislation.qld.gov.au/LEGISLTN/CURRENT/W/WatResMorP07.pdf
Resource operations licences and interim resource operations licences	
Logan River water supply scheme (rol)	http://www.derm.qld.gov.au/water/management/rols.html
Lower Mary River water supply scheme	http://www.derm.qld.gov.au/water/management/irols.html
Upper Mary River water supply scheme	http://www.derm.qld.gov.au/water/management/irols.html
Nerang water supply scheme	http://www.derm.qld.gov.au/water/management/rols.html
Warrill Valley water supply scheme	http://www.derm.qld.gov.au/water/management/irols.html
Climate	
South East Queensland Drought to 2007	http://www.longpaddock.qld.gov.au/AboutUs/Publications/HiddenArea/seq_drought_2007.pdf
Intergovernmental Panel on Climate Change Fourth Assessment Report Climate Change 2007: Synthesis Report	http://www.ipcc.ch/publications_and_data/ar4/syr/en/contents.html

Title	Website
Energy demand and water supply	
Energy use in the provision and consumption of urban water in Australia and New Zealand	http://www.clw.csiro.au/publications/waterforahealthycountry/2008/wfhc-urban-water-energy.pdf
Drinking water quality guidelines	
Australian Drinking Water Guidelines	http://www.nhmrc.gov.au/publications/synopses/eh19syn.htm
Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 1)	http://www.ephc.gov.au/taxonomy/term/39
Guidance on use of rainwater tanks 2004	http://www.health.gov.au/internet/main/publishing.nsf/Content/health-pubhlth-publicat-document-metadata-env_rainwater.htm
National Performance Report -: Urban water utilities	https://www.wsaa.asn.au/Publications/Pages/PerformanceReports.aspx



Protocol for the Communication of Flooding Information for the Brisbane River Catchment - including Floodwater Releases from Wivenhoe and Somerset Dams

OBJECTIVE

The purpose of this protocol is to outline the arrangements for the Brisbane, Ipswich and Somerset Councils, relevant Queensland Government agencies and the Bureau of Meteorology, which will ensure the provision of consistent and robust information to the community, concerning potential flooding impacts for the Brisbane River catchment, including release of floodwater from Wivenhoe and Somerset Dams.

The intent is to ensure that consistent, harmonised information, based on an agreed single technical report, is communicated to the public in a way that contributes to resilient communities.

BACKGROUND

Queensland's disaster management arrangements, based on disaster management groups at local, district and state level, ensure the collaborative and effective coordination of information for all hazards.

Existing local, district and state disaster management and hazard-specific plans outline arrangements and structures for disaster management, or the hazard, and amongst other things, identify the need for coordination of public communications.

This protocol adds to such plans by outlining specific arrangements necessary when advice to the community needs to be based on technical assessments from hazard-specific primary agencies and other complementary stakeholders across federal, state and local governments.

Factors such as storm surges, tides, creek flooding, flooding from the lower Brisbane River, including Lockyer Creek and the Bremer River, will influence inundation levels in Brisbane.

Wivenhoe Dam controls approximately half of the Brisbane River catchment above Brisbane City. The operational strategy for water release from Wivenhoe and Somerset Dams is governed by the *Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam*, henceforth referred to as the Flood Mitigation Manual.

This protocol also covers the possibility that, during an above-average wet season, the water supply level of the dams may be marginally reduced, on a temporary basis, by small water releases. The water supply level would be returned to normal prior to the conclusion of the wet season, to avoid affecting water supply security. These changes, if they proceed, will ultimately be incorporated into the Flood Mitigation Manual.

GENERAL DECISION MAKING - GUIDING PRINCIPLES

- Protection of public safety is paramount throughout both this Protocol and the Flood Mitigation Manual;

- Impact on the community upstream or downstream is a legitimate consideration of any risk assessment;
- Regular and consistent communications within government and to the public, in relation to flooding impacts, are essential;
- Decision-making chains regarding the communications strategy and disaster management should remain flexible and highly responsive;
- The Flood Mitigation Manual is used to determine how Wivenhoe and Somerset Dams will be operated during flood events.
- This Protocol does not infringe the right of any party to issue information in line with their responsibilities.

PROCESS OF COMMUNICATION

There are three stages in the process of communication:

- Monitoring and Assessment
- Briefing and Activation
- Public Communications

Monitoring and Assessment

Communications with the public on flooding information, including floodwater releases, are based on a continuous process of monitoring and technical assessment. The process is dynamic and evolves according to the event, but will normally contain the following steps:

- Routine monitoring of weather events and dam levels by relevant agencies via established systems and procedures;

- The Bureau of Meteorology (BoM) provides weather forecasts and warnings (e.g. Tropical Cyclone, Severe Weather, Severe Thunderstorm, Flood). In the event of heavy rain and runoff in the Wivenhoe and/or Somerset Dam catchments, BoM and the Queensland Bulk Water Supply Authority (Seqwater) discuss modelled inflows to Wivenhoe and/or Somerset Dam, and downstream flood levels.

- Councils monitor, to the extent that they are able, creek levels, local runoff and flash flooding, consult with BoM and Seqwater on other potential events upstream that may contribute to and aggravate the situation.

- Seqwater discusses and models implications of the inflows on the necessary floodwater release from Wivenhoe Dam and/or Somerset Dam. The floodwater release strategy is a balance between releasing the water quickly enough so that the flood storage capacity is available if another major rain event occurs, versus minimising downstream flooding impacts (human safety and property damage) from the releases.

- Seqwater calculates the floodwater releases according to dam levels and predicted weather events in accordance with the Flood Mitigation Manual. A fundamental principle is that all floodwater should be released from the dams within seven days of the flood event peaking in Wivenhoe or Somerset Dam. This ensures the dams can cope with closely spaced major rain events.

- Seqwater shares predicted floodwater releases with BoM and with the Councils.

- Councils with the ability to monitor flooding share information on the status of

the Brisbane River catchment and its river systems with each other, BoM, Seqwater.

- BoM undertakes modelling of the Brisbane River catchment and its river systems using Seqwater advice of actual and projected Wivenhoe Dam and/or Somerset Dam releases when these are occurring, or are expected to occur.

- BoM participates in technical discussions with Seqwater, Brisbane City Council, Ipswich City Council and Somerset Regional Council as necessary, to share modelling results. The discussions aim to establish a technical agreement on the flood situation, on which public communications should be based.

- Councils with the necessary resources and expertise undertake modelling, form predictions, identify flood inundation areas and assess impacts for their communities, and regularly share this information with all relevant parties. Councils without the necessary resources and expertise will rely on information from other agencies to complete the impact assessment for their communities.

During this continuous process, it may become apparent to either BoM, local governments or Seqwater that the situation is likely to result in public safety issues.

These public safety issues may arise from a decision to release floodwater, a significant change in the severity and scope of the event, or a pre-agreed trigger-point being reached.

Any of the agencies may initiate the public communications process and engage with the disaster management arrangements as appropriate.

The trigger points for commencing public communication of flooding information are defined according to an agency's responsibilities.

The initiating agency will instigate a technical staff teleconference. Decisions from the teleconference will be distributed to senior management and media representatives of each agency.

In these circumstances all agencies agree that technical advice will form the basis of public communications messages.

- In every case of floodwater release from Wivenhoe or Somerset Dam, Seqwater coordinates the completion of the Technical Situation Report - TSR (Appendix C) and provides the Report to the SEQ Water Grid Manager (according to their Emergency Response Plan), and to relevant local governments.

- In other circumstances where a formal technical statement would enhance clarity, the local or state agency initiating the public communication of flooding information will pull together relevant information from other agencies in the form of a TSR. If initiated, the TSR should be circulated to all parties.

Briefing and Activation

If public safety is considered to be at risk, consideration will be given to the activation of the disaster management arrangements, if not already activated.

1. Councils will consider activating their Local Disaster Management Groups (LDMGs);

2. LDMGs will inform the relevant District Disaster Coordinators (DDCs);

3. The Queensland Police Service (QPS) will consider initiating disaster management actions as provided for under the *Disaster Management Act 2003*;

4. In the case of floodwater release:

   (a) the SEQ Water Grid Manager will alert the Director-General (DG) of the Department of Community Safety (DCS), DG Department of Environment and Resource Management (DERM), and the local governments

   (b) DG DCS will inform the DG of the Department of Premier and Cabinet (DPC) - the Chair of the State Disaster Management Group (SDMG) and will activate the State Disaster Coordination Centre (SDCC). DG DCS will also inform the Minister for Police, Corrective Services and Emergency Services

   (c) DG DERM will inform the Minister for Natural Resources, Mines and Energy

   (d) DG DPC will inform the Premier;

5. In the case of an extreme event, the Crisis Communications Network, chaired by DPC, may be activated at the direction of the SDMG Chair to coordinate public messaging from BoM, Seqwater, SEQ Water Grid Manager, QPS, relevant Councils and DCS as per this protocol;

6. In the case of a non-disaster, public communications will be in accordance with existing arrangements, supported, where appropriate, by this protocol.

Public Communications Issues

Each agency has its own responsibilities to issue information commensurate with their role without prior approvals. The obligation under this protocol is to share that information with other agencies and operate in a fully consultative process to ensure consistent public information.

The BoM, Local Governments and relevant State Government agencies agree to maintain continual discussions, to ensure that conflicting information is not released to the public at any time. Genuine efforts should be made to ensure consistency by basing public communications on technical reports. Inter-agency consultation should not cause delays in the issuance of public warnings. All agencies agree to exchange public communications at time of release. No power of veto to any organisation is implied under this protocol.

Harmonised public communications messages will be released from the following agencies:

- **Bureau of Meteorology** - concentrating on Flood Warnings which are widely disseminated to the BoM website, agencies and the media. BoM also participates in media (radio, television, newspaper) interviews to provide factual information regarding observed and forecast weather conditions, rainfalls and water levels;

- **Local Governments / Local Disaster Management Groups** - concentrating on the effects of weather related events and safety for their local communities and residents, and the impacts on councils' assets. Local governments have primacy of public communications within their community. Community service

announcements from local governments will be shared with the relevant agencies, prior to public release if time allows;

- **SEQ Water Grid Manager -** if floodwater releases from Wivenhoe and Somerset dams are involved, the SEQ Water Grid Manager concentrates on the communication aspects of release timings and duration of effects as the State's lead communication agency on floodwater release. Seqwater operational staff are to ensure that technical information is communicated to the SEQ Water Grid Emergency Response Team (if activated), the SEQ Water Grid Communications Unit and relevant local governments.

If necessary these will be augmented by:

- **Queensland Police Service** - concentrating on specific community safety messaging during operations;

- **Department of Community Safety** - concentrating on general safety matters regarding flooding;

- **Department of Premier and Cabinet (extreme events only)** - concentrating on consistent messages to media and agencies concerned.

Event-specific information will be released to the public as frequently as required by the severity and scope of the event. Timings of media releases will be dependent on the event, guided by the frequency of technical reports and may range from once a day to once an hour.

In the case of floodwater release from Wivenhoe and/or Somerset Dam, SEQ Water Grid Communications Unit will centrally track all communications and ensure they are shared. The unit will liaise with the following or their representatives over pubic safety messages:

- BoM;
- Seqwater;
- Councils' Media Directors;
- QPS Media Director; and
- DCS Media Director.

Questions from the Public

All questions from the public should be directed to the relevant local government in the first instance. Questions expressly relating to the event should be directed to the hazard-specific primary agency. Any questions relating to the release of floodwater should be directed to the SEQ Water Grid Communications Unit. Any queries about disaster management should be addressed by the relevant local and district disaster management groups.

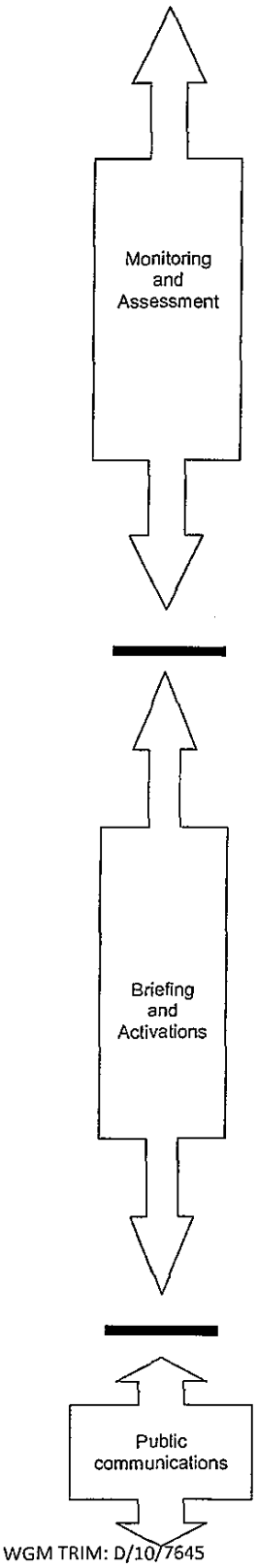
Protocol Maintenance

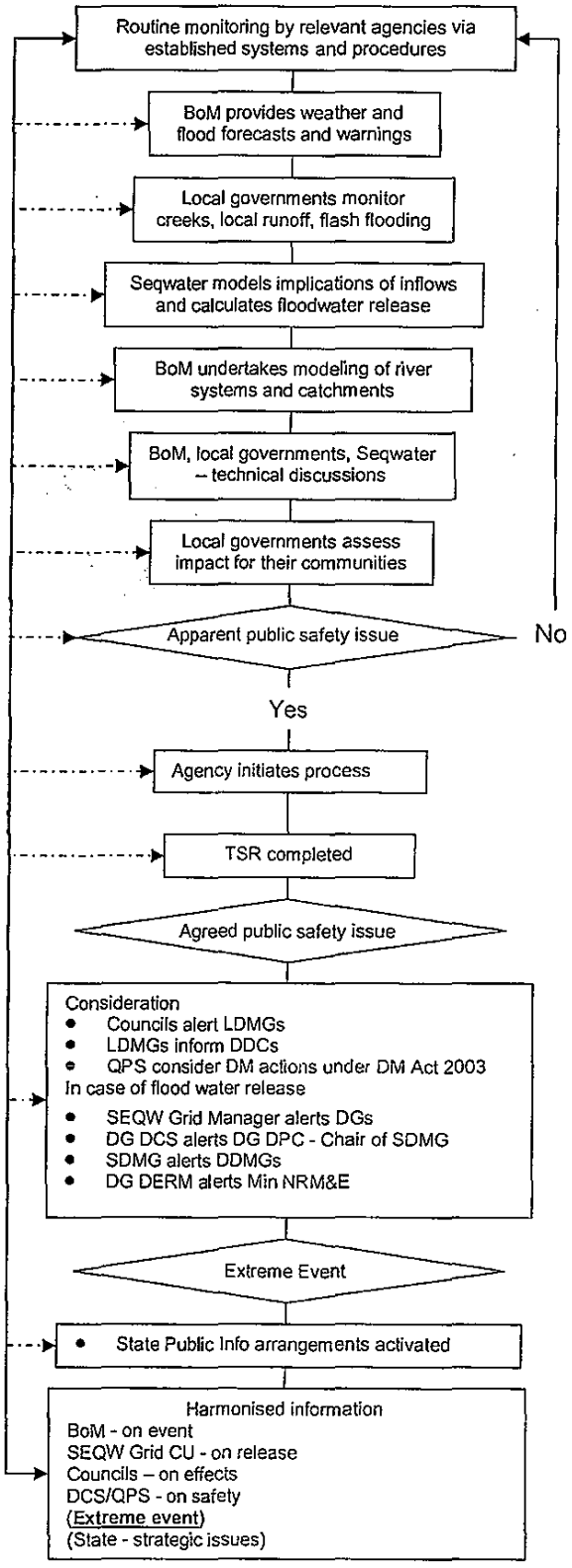
This protocol will be reviewed annually by agencies involved and exercised, during non-operational season, under DDMG arrangements.

The protocol should provide for a review after each event of what worked and could be improved for management of future events, to be led by DCS.

Appendix A

Communications process for the release of floodwater from Wivenhoe and Somerset Dams





WGM TRIM: D/10/7645

Appendix B

ROLES AND RESPONSIBILITIES

- The Bureau of Meteorology (BoM) is the agency responsible for issuing flood warnings for the Brisbane River and its major tributaries. These, when required, include rainfall forecasts for the Brisbane catchment and predicted river heights for Brisbane City, Ipswich, Jindalee and Moggill according to established procedures.

  River height predictions are agreed in consultation with Seqwater, Brisbane City Council (BCC), Ipswich City Council (ICC) and Somerset Regional Council (SRC), as required.

- Queensland Bulk Water Supply Authority (Seqwater) operates Wivenhoe and Somerset Dams in accordance with the Flood Mitigation Manual. It provides dam outflow information to BoM, to allow the development of Flood Warnings and to local authorities, to assist them in quantifying likely impacts within their areas.

  It informs BoM and other agencies on the status of dams, and actual and projected releases from Wivenhoe and Somerset dams. It consults BoM regarding inflows to Wivenhoe and Somerset dams and expected flood heights along the Brisbane River downstream of Wivenhoe Dam.

  Seqwater initiates proposed reviews or updates to the Flood Mitigation Manual, undertaking consultation with Councils and other stakeholders. Seqwater coordinates the production of the TSRs relating to floodwater releases from the Wivenhoe and Somerset dams.

- Brisbane City Council (BCC), Ipswich City Council (ICC) and Somerset Regional Council (SRC) distribute consistent, detailed local flood level information, both to their respective operational units, their senior management and their broader communities. This should include the interpretation of BoM flood warnings and river height forecasts into expected areas and depths of inundation. Councils are responsible for activating their respective Local Disaster Management Groups (LDMGs), which then undertake the disaster management responsibility for response in the community.

- Department of Environment and Resource Management (DERM) consults with the stakeholders prior to the approval of any updates to the Flood Mitigation Manual. DERM also approves any necessary variations to the strategies in the manual if required during the course of a flood event.

- Queensland Police Service (QPS) assumes a legislative role, as per the disaster management system, to provide disaster management at a district level during an event, including provision of necessary community advice for public safety.

- Emergency Management Queensland (EMQ) provides support and general community safety advice on flooding issues, during non-operational times.

- SEQ Water Grid Manager in the case of floodwater release alerts the Director-General (DG) of the Department of Community Safety (DCS), DG Department of Environment and Resource Management (DERM), and the local governments.

- SEQ Water Grid Communications Unit tracks the general harmonisation, but not specific detail of public messaging relating to floodwater releases, with BoM, SEQ Water Grid, Councils and DCS, as required. It does this by ensuring that each agency understands the extent of the release and that there is a general consensus as to the level of potential impacts.

Appendix C

TECHNICAL SITUATION REPORT

TSR Number		Date of TSR release		Time of TSR release	

This report is as at the time of assessment, and may quickly become out of date, depending on the current events. It relies on timely information provided by Seqwater, BoM and Councils. A reply will be required by a specified time and if not received by that time no information will be included. If any information is not provided, the section will remain blank. There will be no follow up requests.

Each authority will provide an email and telephone contact for all communications. If an event escalates, there may be less time to respond or it may not be possible to respond to requests.

In floodwater releases Seqwater will email advices on releases to the organisations email address provided. Once a flood event is initiated, at any time a Council or agency can contact Seqwater to discuss if they have a serious concern regarding the information on releases provided. This would normally be by phone and followed by email. However, the ability to respond to any queries depends on the event. The frequency of advices will depend on the severity of the event and the needs of each agency.

Seqwater will also request at that time, a situation assessment from each agency as per details outlined in this document. Each agency will then email in return the requested information if possible or advice that it has not changed. If it is not received within the specified timeframe, it is assumed it is not being provided.

Seqwater status of inflows and dam operations

(to include information on the current and/or predicted levels of Somerset and Wivenhoe Dams and the probable or planned release strategy with assessment as governed under the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam)

This is Seqwater's status report on the dam levels, probable inflows and planned releases.

.....

This has been supplied to
BCC on .....
ICC on .....
SRC on .....

Issues raised by Councils were .....

Actions taken were .....

Seqwater Technical Officer name	
Seqwater Technical Officer position title	
Seqwater Technical Officer contact details	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM is to provide either a copy of, or links to, their current information and other updates or comments if needed. This will be their current set of warnings and may be updated or changed at any time.

BoM Technical Officer name	
BoM Technical Officer position title	
BoM Technical Officer contact details	

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

This is an assessment as provided by BCC. A request for this information will be sent to the email address provided by BCC.

BCC Technical Officer name	
BCC Technical Officer position title	
BCC Technical Officer contact details	

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

This is an assessment as provided by ICC. A request for this information will be sent to the email address provided by ICC.

ICC Technical Officer name	
ICC Technical Officer position title	
ICC Technical Officer contact details	

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

This is an assessment as provided by SRC. A request for this information will be sent to the email address provided by SRC.

SRC Technical Officer name	
SRC Technical Officer position title	
SRC Technical Officer contact details	

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	
Contact Officer position title	

Next TSR due	**Date**		**Time**		**or Event**		

WGM TRIM: D/10/7645

Barry Dennien

From: Barry Dennien
Sent: Wednesday, 1 December 2010 11:56 AM
To: Jim Pruss (jpruss@seqwater.com.au); Rob Drury (rdrury@seqwater.com.au)
Subject: Dam levels - Investigation
Attachments: image001.gif

Jim Rob

Hope all is well.

Just following up on our discussions with regards dam levels and flood impacts. Anything I can do to help?

We are due to get back to the Minister by the end of November.

Regards

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
Phone: (07) 3033 0785 | **Fax:** (07) 3405 0373 | **Mobile:** 0419725708
Email: barry.dennien@seqwgm.com.au
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Barry Dennien

From: Michael Lyons
Sent: Wednesday, 1 December 2010 2:20 PM
To: SEQWGM Media; Barry Dennien
Cc: Mike Foster
Subject: Fwd: Weather update media release
Attachments: cidimage001.png@01C92F65.8EFAC010; ATT00001.htm

FYI-let's put a one para release together advising that no go on Wivenhoe as per Mike's advice. Will bridle speculation.

Aleisha will you and Jadepur this together. I've already told Geoff about the gates not opening but not about s release.

Cheers

Mike

nt from my iPhone

Begin forwarded message:

> **From:** Mike Foster <mfoster@seqwater.com.au>
> **Date:** 1 December 2010 2:09:03 PM AEDT
> **To:** Michael Lyons <Michael.Lyons@seqwgm.com.au>, John Adcock <John.Adcock@seqwgm.com.au>
> **Cc:** Rob Drury <rdrury@seqwater.com.au>, Paul Bird <pbird@seqwater.com.au>
> **Subject: Weather update**
>
> Gents,
>
> Just left a message with Greg from BCC on rainfall etc
>
> Essentially ...bugger all rainfall over Wiv/Som overnight (between 8-11mm). Another 10mm or so forecast tonight and not much more over the rest of the week.
>
> Unless the forecast changes dramatically, there is no expectation Seqwater will have to operate the Wivenhoe gates etc.
>
> As previously discussed Seqwater will advise ahead of time if gate operations become likely.
>
> I love your work!

Barry Dennien

From: Michael Lyons
Sent: Thursday, 2 December 2010 10:26 AM
To: Barry Dennien
Subject: FW: Emailing: Wivenhoe Fact sheet_ORIGINAL
Attachments: Wivenhoe Fact sheet_ORIGINAL.docx

Barry,

Attached is the Wivenhoe fact sheet for approval through DERM etc. It is approved by Seqwater and would be good to get ramped up and printed over the next few days in readiness for any action in the coming weeks. Also we've had very fruitful have been in discussions with the various local governments about putting a version of this in with their next information letters to rate payers. They are keen.

Regards

Mike

Michael Lyons
Director
SEQ Water Grid Communications Unit
SEQ Water Grid Manager
Phone: (07) 3247 3014 | Fax: (07) 3405 0373
Email: michael.lyons@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002

-----Original Message-----
From: Andrew Musgrave
Sent: Thursday, 2 December 2010 10:08 AM
To: Michael Lyons
Subject: Emailing: Wivenhoe Fact sheet_ORIGINAL

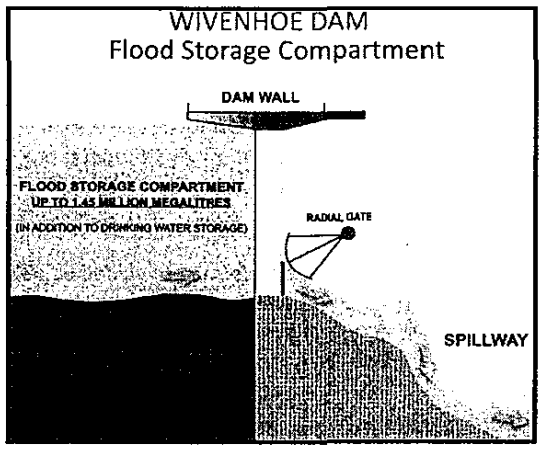
Attached is the copy I sent to john a couple of days ago - this is the latest version you and I have been working on Mike.

Regards

AjM

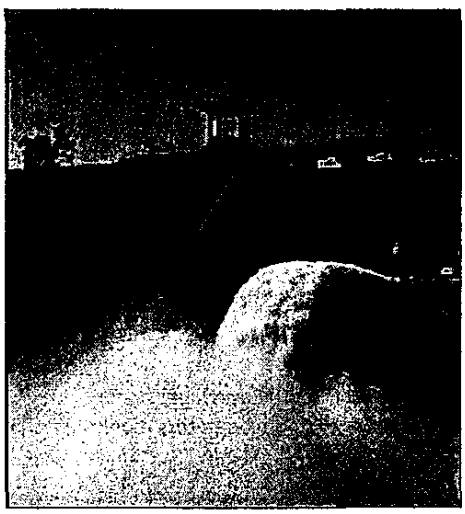
SEQ Water Grid

. . . A MILLION REASONS TO BE PROUD



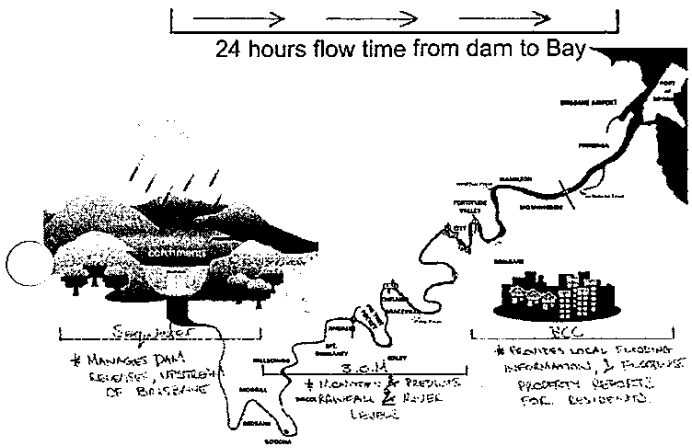
- Wivenhoe Dam was built in response to the 1974 floods, and is an award winning feat of hydrological and structural engineering.
- Somerset Dam was completed in 1959. In the event of heavy rains, Somerset releases water downstream to Wivenhoe when it reaches full capacity.
- On top of storing as much as 1.15 million megalitres of precious drinking water, Wivenhoe can also store an additional 2.5 times the volume of Sydney Harbour. The space for this extra water is called the dam's flood storage compartment. Its job is to hold back the flood waters which gather in the Brisbane Valley and which can threaten Brisbane after heavy weather events.
- The flood storage compartment temporarily stores flood waters and releases them at a controlled rate so as to minimise downstream impacts. In other words, there will be much lower flood levels along the Brisbane River in the Ipswich and Brisbane urban areas than would have otherwise occurred without the dam.
- Wivenhoe Dam is able to withstand a flood with a 1 in 100,000 risk of occurring in any one particular year, an extremely rare event.
- In an event similar to January 1974, there would still be a large amount of local flooding in and around Ipswich and Brisbane due to the heavy local rainfall but water levels along the Brisbane River would be reduced due to the mitigating impact of Somerset and Wivenhoe dams.
- If it wasn't for Wivenhoe and Somerset dams, as many as a million people, their properties and infrastructure could be at even greater risk of serious flood, this makes these dams a crucial component of South East Queensland's flood mitigation plan and something Queenslanders can be proud of.

Spectacular pictures - but why does Wivenhoe have to release stored flood water?



- South East Queensland has a weather pattern that often sees prolonged or multiple rain events in close succession.
- As soon as Wivenhoe's flood storage compartment begins to fill, it has to be carefully emptied. This has to be done in order to make room in case another heavy rainfall event arrives quickly. Before any release from the compartment, the following flood factors are considered: catchment runoff below the dam wall, urban runoff and huge tides.
- Brisbane can still flood from other sources such as direct rainfall in the catchment below the dam wall, and because Wivenhoe only controls 50% of the Brisbane Catchment.
- A fundamental principle is that all floodwater should be released within seven days. This means the greater the volume received in the flood storage compartment, the greater the discharge required.

How are the releases managed?



Before Wivenhoe begins a controlled emptying of its flood storage compartment, a dedicated 24hour Flood Operations Centre is activated for the specific purpose of managing the possible effects downstream.

The actions of the Flood Operations Centre are guided by a *Flood Mitigation Manual*. The Queensland State Government, local councils and all emergency services are advised before the water flows so that communities can be warned and take all necessary precautions.

The amount of water being released depends on the level currently inside the flood storage compartment, as well as the amount of incoming flows and flows in downstream tributaries.

Wivenhoe's managers therefore have to decide on how much to let go in order to keep Wivenhoe ready for more rain and safe.

The following priorities are considered when determining how much water has to be let go, and how fast:

- ensuring the structural safety of the dam
- providing maximum protection from flooding for urbanised areas
- minimising disruption to rural industries along the Brisbane River and Stanley River valleys
- retaining the storage at Full Supply Level at the conclusion of a flood event
- minimising impacts to riparian flora and fauna during the water release phase of a flood event.

What could happen in an extreme flood event?

An extreme flood event would come as a result of exceptionally heavy rainfall within a short period of time.

During an extreme rainfall event, Wivenhoe Dam will control the release of flood waters into the Brisbane River.

However, a large portion of South East Queensland could already be experiencing severe flooding from this rainfall event prior to any release from the dam, as a result of localised flooding caused by urban run-off into creeks and streams, and the fact that Wivenhoe only controls 50% of the Brisbane catchment.

During a major flooding event the Bureau of Meteorology, SEQ Water Grid, Seqwater (Wivenhoe and Somerset Dam operators) and local councils work together to formulate advice and instructions for the public and relevant Emergency Services on how to manage impending localised flooding.

The Bureau of Meteorology, Seqwater and local councils continually monitor rainfalls throughout all South East Queensland catchments during a flood event. The Bureau of Meteorology provides rainfall forecasts for Seqwater's dam operators monitoring the surrounding catchments.

Using this information, a comprehensive network of river height sensors and real time rainfall data across the Wivenhoe catchment, Seqwater is then able to formulate a schedule of controlled dam releases to ensure the safety and integrity of the dam wall is maintained, and maximum protection from flooding in urban areas is achieved.

Dam releases are undertaken in accordance with the Manual of Operational Procedures from the *Flood Mitigation Manual*, which is approved by Queensland's Dam Safety Regulator in accordance with the *Water Supply Act 2008*.

Based on the Bureau's forecasts and predictions, as well as Seqwater's dam releases, South East Queensland local councils then begin alerting residents to road and bridge closures, as well as advising on the severity and flows of the impending flood event.

How to prepare for flooding?

In the event of flooding, the Bureau of Meteorology, working together with the SEQ Water Grid, bulk water authorities and local councils to ensure minimal impact downstream after any dam releases. For information on local flooding, contact your local council for flood information packs and advice.

Barry Dennien

From: Michael Lyons
Sent: Thursday, 2 December 2010 12:06 PM
To: John Adcock; Barry Dennien
Subject: FW: Releases FYI
Attachments: image003.jpg; image001.jpg

From: Paul Bird [mailto:pbird@seqwater.com.au]
Sent: Thursday, 2 December 2010 12:04 PM
To: Michael Lyons
Cc: Mike Foster
Subject: FW: Releases FYI

Michael,

FYI

We have started a release from Somerset that will operate during work hours today and tomorrow. Wivenhoe has increased hydro releases to accommodate (not really visible as below water) and will run until next week to keep everything around 100%.

Opened a cone valve about 10% at North Pine just to keep level down.

Although not necessary as the protocols are for flood releases, Rob Drury spoke to Brisbane CC, Ipswich CC and Somerset RC just to keep them up to date. They were fine and knew they would be advised if there were any releases. He made sure they knew we wouldn't always advise for such minor operational releases but given the media attention in papers last few days thought it best. They appreciated it as they had been asked by their Councils.

Cheers,

Paul

Paul Bird
Senior Communications Advisor
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

P 07 3035 5519 M 0409 111 870 E pbird@seqwater.com.au
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

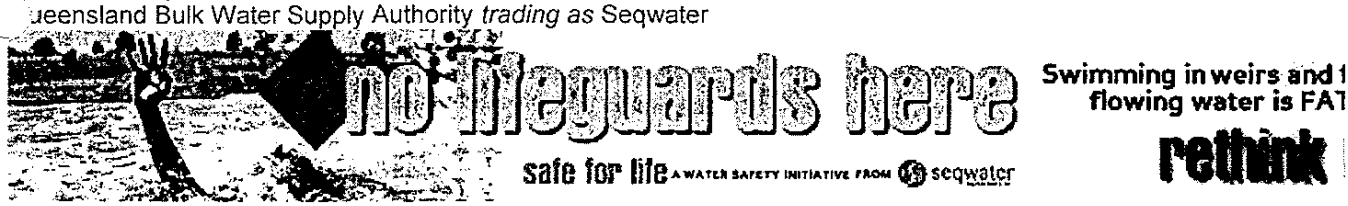
Gina O'Driscoll

From: Rob Drury [rdrury@seqwater.com.au]
Sent: Thursday, 2 December 2010 3:11 PM
To: Barry Dennien; Jim Pruss
Cc: Peter Borrows
Subject: RE: Dam levels - Investigation
Attachments: WIVENHOE DAM - Storage Lowering Investigation.docx

Barry,
Attached is our DRAFT reply on possibility and impact of lowering dam levels on floods for your review and any comments.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

Ph (07) 54278131 | Fax (07) 54261097 | M 0419378740 | E rdrury@seqwater.com.au
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Barry Dennien [mailto:Barry.Dennien@seqwgm.com.au]
Sent: Wednesday, 1 December 2010 11:56 AM
To: Jim Pruss; Rob Drury
Subject: Dam levels - Investigation

Jim Rob

Hope all is well.

Just following up on our discussions with regards dam levels and flood impacts. Anything I can do to help?

We are due to get back to the Minister by the end of November.

Regards

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager

Phone: (07) 3033 0785 | **Fax:** (07) 3405 0373 | **Mobile:** 0419725708
Email: barry.dennien@seqwgm.com.au
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Summary of comments

The attached paper summarises an analysis that changing the initial storage level of dams has on downstream flood impacts.

Wivenhoe/Somerset System

The analysis shows that for some minor floods similar to October 2010, reducing the starting volume of Wivenhoe Dam by 5% or 10% has minimal impacts on impacts downstream. The main benefit being that inundation times for downstream bridges will be reduced but only by around15%. However peak water levels are not affected. There are minimal potential benefits to downstream bridge until dam levels are reduced down to about 50% of capacity.

These results are not unexpected as Wivenhoe has such a large flood storage. Adding say 100,000ML to the flood storage (equates to reducing the storage volume by 10%) does not appreciably increase this available flood storage.

It should also be noted that in many cases, Wivenhoe flood releases will be made following the peaks of inflows into the Brisbane River from the Lockyer and Bremer Catchments. Certainly during many events, Lockyer Creek could already have inundated most or all of the road crossings downstream of Wivenhoe Dam. In these instances, a small amount of additional flood storage in the dam provides minimal benefit.

Another option considered was pre-releasing Wivenhoe water in anticipation of a flood event. This is not considered a viable option for the following reasons:

- Regardless of forecast, there is never any certainty on the amount of rain that will fall within a dam catchment. For example, on 29 November 2010, the quantitative forecast from BOM for the Wivenhoe Catchment was 25 to 50 millimetres. Actual rainfall received was in the order of 10 millimetres. On a saturated catchment this could equate to a runoff discrepancy of hundreds of thousands of megalitres. A pre-release of anticipated flood water based on forecast could result in major embarrassment.
- Any significant pre-release of water would result in bridge inundation below Wivenhoe Dam.
- Any pre-release of water from Wivenhoe Dam will take at least 24 hours to reach the lower end of the Brisbane River system. Rains occurring in the catchments below the dam over this period could potentially worsen downstream flood impacts.

The Bureau of Meteorology has been contacted and they have confirmed the above forecast reliability assessment. They advised that, whilst weather prediction models are steadily improving, the forecast of rainfall amounts over catchment time/space scales is recognised as one of the most challenging/difficult tasks. Detailed rainfall forecasting is not deterministic - the uncertainties involved are often expressed in probablistic forecasts and whilst there is often the ability to forecast the potential for a significant rain event to occur in the southeast Qld-northern NSW region, it is difficult (if not impossible) to predict the actual location of the heaviest rain, even with only a few hours notice.

The Queensland Director of Dam Safety (Mr Peter Allen) was contacted and he confirmed the assessment that minor reductions in the stored volume of Wivenhoe Dam would have

minimal impacts on floods downstream and concurred with the risks involved in any pre release of significant volumes of water from dams prior to an event.

North Pine and Leslie Harrison Dams

Lowering the normal FSL for North Pine and Leslie Harrison Dams will have minimal impact on major floods and may not decrease releases depending on the size of even minor events. However lowering the level of North Pine Dam after a flood release to between 95% and 100% may reduce the frequency of operations in some rain events although the main benefit is in operational efficiency as it provides more time for response and may reduce making releases in a minor storm event.

Similarly reducing Leslie Harrison level to around 95% after or before an event could assist in reducing call out of staff and manning the storage for minor releases and even the timing of releases.

Normally both dams are returned to just under 100% after an event based on base inflows still occurring and possible further rain. Allowing the dams to reduce to around 95% improves the operational leeway. However this could best be provided by an operational arrangement where the WGM simply agrees Seqwater has the operational latitude to reduce both storages to between 95% and 100% after an event or when there is some inflow and Seqwater can decide the exact level based on ongoing inflows and possible predicted rainfall, but not going below 95%.

DAM FULL SUPPLY LEVEL (FSL) INVESTIGATIONS
SEQWATER GATED STORAGES

INTRODUCTION

The following short paper examines the issues associated with temporary lowering the full supply levels of Seqwater's gated dams to improve short term flood mitigation benefits. The paper considers Wivenhoe Dam, Somerset Dam, North Pine Dam and Leslie Harrison Dam.

WIVENHOE DAM AND SOMERSET DAM

Wivenhoe Dam and Somerset dam control only 50% of the Brisbane River catchment (Bremer River and Lockyer Creek catchments are not controlled), therefore the Flood Mitigation benefits provided by the dam will depend on the rainfall distribution experienced during a flood event. This makes it difficult to quantify exactly the benefits of lowering the storage in anticipation of possible flood rains.

There are primarily two types of flood events that may occur in the Brisbane River Catchment. There are the smaller events that impact primarily on the rural bridges upstream of Moggill and the larger events that impact on urban areas in Brisbane. The threshold that separates these two events is a river flow of around 3500 cubic metres per second at Moggill. To understand the possible benefits of lowering the storage to reduce flooding impacts, it makes sense to discuss these two types of events separately.

Events Impacting on Bridges (Moggill Flow < 3500m^3/s) – Limited Urban Impacts

In recent history, flood events of this nature occurred in April 1989, February 1999 and October 2010. The flow characteristics of events of this type are shown in the following table.

Event	Wivenhoe Dam					
	Starting Level		Volume Of Inflow	Volume Of Outflow	Peak Outflow	Peak Water Level
	m AHD	%	ML	ML	m3/s	m AHD
Early April 1989	67.06	>100	690,000	690,000	1,620	69.78
Late April 1989	67.00	100	870,000	820,000	1,490	71.45
February 1999	63.92	<100	1,220,000	900,600	1,800	70.45
October 2010	67.03	>100	640,000	640,000	1,300	69.65

The October 2010 event was examined to determine the benefits of lowering the storage level. This event commenced with the dam at FSL. The event was examined with the dam at 95% capacity, 90% capacity, 80% capacity, 50% capacity and empty at the commencement of the event. The results are shown in the following table. When reading the table it is important to understand that the bridges are impacted not just by outflows from Wivenhoe, but also by flows from the uncontrolled areas of the river catchment. Accordingly, the location of a bridge within the system will dictate the size of catchment area that will impact on the bridge. All inundation times shown in the table are approximations only, made for the purposes of this investigation.

Dam Percentage Full at Event Commencement	Approximate Duration of Wivenhoe Radial Gate Releases/ Twin Bridges Inundation (hours)	Approximate Duration of Savages Crossing and Colleges Crossing Inundation (hours)	Approximate Duration of Burtons Bridge and Kholo Bridge Inundation (hours)	Peak Flow at Moggill (m^3/s)
100%	230	247	183	1848
95%	187	214	183	1848
90%	185	214	183	1841
80%	172	214	183	1786
50%	130	214	153	1722
0%	0	189	38	940

The table shows that the reduction in FSL won't have a large impact on Bridge inundation times. A reduction in the order or 36 hours or 15% of the total inundation time may be possible for the low level bridges only. The reductions are generally caused by the delay in release commencement associated with the lower starting FSL. However, the bridges can often already inundated at this time anyway due to flood inflows into the Brisbane River from the 50% of the catchment not controlled by Wivenhoe Dam. Lowering the FSL of the dam has no impact on such inundations as shown in the table.

For events smaller than those considered above, it should be noted that the Manual of Flood Mitigation allows a trigger level buffer of 27500 megalitres above FSL and this has the effect of protecting Twin Bridges and the lower level bridges from inundation as a result of minor events. Twin Bridges is essentially a low level causeway that is inundated following any radial gate release. This inundation could possibly be prevented by raising the bridge deck level. Regardless, the areas accessed using this bridge can also be accessed using the Fernvale Bridge. It is acknowledged however that the closing of Twin Bridges causes inconvenience to local residents, as it adds approximately another five kilometres to the journeys to and from their residences. Approximately 40 residences and several businesses (primarily turf farms) are impacted.

Events Impacting on Urban Areas (Moggill Flow > 3500m^3/s) – All rural bridges inundated

Events of this nature have not been experienced since the construction of Wivenhoe Dam was completed in 1984, with the last event of this nature being experienced in 1974. The inflow volume into Wivenhoe Dam associated with the 1974 event has been estimated to be in the order of 1.5 million megalitres. However during the 1974 event, an additional 1.5 million megalitres of flood flow impacting of the urban areas of Brisbane originated from catchment areas that are not controlled by Wivenhoe Dam.

For events of this nature, it is unlikely that peak water levels in Brisbane would be significantly impacted by minor reductions in the level of Wivenhoe Dam. Certainly reductions in dam volume in the order of at least 250000 megalitres would be needed to provide any significant reduction in water level peaks experienced in urban areas. Additionally, reductions in the FSL of this order would not necessarily guarantee reductions in urban flood levels, as the effectiveness of Wivenhoe Dam in reducing urban flood levels is

directly dependant on the distribution of rainfall in the Brisbane River catchment during a flood event (Wivenhoe Dam controls only 50% of the total Brisbane River catchment) and the spacing between individual flood events.

NORTH PINE DAM

North Pine Dam has no flood mitigation potential. Unlike Wivenhoe Dam, once the dam has reached FSL, all water flows into the dam must be released to protect the structural safety of the dam.

Any radial gate operation at North Pine Dam to release flood water, results in inundation of Youngs Crossing Road, so lowering the FSL is problematic and may best be achieved by increasing the daily water diversion to the North Pine Dam Water Treatment Plant. There are river release valves that allow some water to be drained from North Pine Dam without inundating Youngs Crossing. These valves have been operated continuously since the recent gate releases to manage residual inflows into the dam. However outflows from these valves are restricted to flows in the order of several hundred megalitres per day as larger flows will adversely impact on Youngs Crossing. Certainly a small reduction in the level of North Pine Dam is potentially beneficial in preventing closures of Youngs Crossing Road associated with small storm events.

It should be noted however that Youngs Crossing Road is also impacted by uncontrolled flood flows from Lake Kurwongbah and local storm run-off. In recent times Youngs Crossing Road has been closed by flood water during times when no water releases were being made from North Pine Dam, but when storm rains resulted in flood flows from uncontrolled areas of the catchment.

The table below gives an indication of the rainfall required to operate for NPD:

Level	Capacity			Rainfall Required to Operate	
				Wet Conditions	Dry Conditions
	m AHD	%	ML	mm	mm
FSL	39.60	100.0%	214,302	5	60
Reduced FSL	39.10	95.0%	203,618	35	100

Recent changes to the Manual of Flood Mitigation for North Pine Dam allows for some ability to retain up to 2500 megalitres of water to reduce impacts on Youngs Crossing Road, provided favourable weather forecasts are experienced. However the preferred option to reduce public inconvenience associated with storm events would be to raise the flood immunity of the river crossing on Youngs Crossing Road. This crossing is primarily a low level causeway that is potentially unsuitable given the volume of traffic that now uses this crossing on a daily basis.

LESLIE HARRISON DAM

Similar to North Pine Dam, Leslie Harrison Dam has no flood mitigation potential. Once the dam has reached FSL, all water flows into the dam must be released to protect the structural safety of the dam.

The dam is relatively small with a total full supply storage volume of only 24800 megalitres, against an inflow volume during a 72 hour 1 in 50 year storm event of over 30000 megalitres. Flood gate operations at Leslie Harrison Dam do not impact on public roads and generally only inconvenience the general public during large flood events. Reductions in this inconvenience cannot be achieved by small reductions in dam storage level.

Barry Dennien

From: Scott Denner
Sent: Friday, 3 December 2010 2:12 PM
To: Barry Dennien; Chris Owens; Storm Stickland; Peter Wyllie; Lee Hutchison; Grant Horton; Shion Yee; Cliff Horwood; Dan Spiller; Michael Lyons; Joanne Collins; Elaina Smouha; Andrew Musgrave; Aleisha Coote; Shelley Banks; Jade Simmons
Subject: Protocol for Flood Releases from Wivenhoe
Attachments: Draft Protocol for Communication of Flooding Information - releases from Wivenhoe Dam.tr5; Draft Protocol for Communication of Flooding Information - releases from Wivenhoe Dam.DOCX

Duty Execs/Emergency Managers/Communications Managers,

Following the last flood release from Wivenhoe Dam, a determination was made that a greater degree of cooperation was required between the Federal, State and Local government agencies involved, both to collaboratively determine likely impacts and inform the public in a coherent manner.

The Protocol has been developed to final draft stage. It is unlikely to be fully confirmed prior to Christmas, and as such, the Premier has requested of the parties involved that we utilise the protocol in its current draft format until the final version is approved.

The WGM plays a key role in notifying a range of agencies if a release is planned, as well as aligning the public communications between State and Local Government agencies.

Please familiarise yourself with the draft policy (attached). A hard copy of it will be included in the Duty Manager Pack (pls **Lee**)

Thanks

Scott

Scott Denner
Director Risk and Technology
SEQ Water Grid Manager
Ph: 0061 (07) 3404 0798 | Fax: 0061 (07) 3405 0373
Email: scott.denner@seqwgm.com.au
Post: PO Box 16205, BRISBANE CITY EAST, QLD 4002
Visit: Level 15, 53 Albert St, BRISBANE
ABN: 14783 317 630

Protocol for the Communication of Flooding Information for the Brisbane River Catchment - including Floodwater Releases from Wivenhoe and Somerset Dams

OBJECTIVE

The purpose of this protocol is to outline the arrangements ~~to be followed by~~for the Brisbane, Ipswich and Somerset Councils, relevant Queensland Government agencies and the Bureau of Meteorology, which will ensure the provision of consistent and robust information to the community, concerning potential flooding impacts for the Brisbane River catchment, including release of floodwater from Wivenhoe and Somerset Dams.

The intent is to ensure that consistent, harmonised information, based on an agreed single ~~point of truth~~technical report, is communicated to the public in a way that contributes to resilient communities.

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BACKGROUND

Queensland's disaster management arrangements, based on disaster management groups at local, district and state level, ensure the collaborative and effective coordination of information for all hazards.

Existing local, district and state disaster management and hazard-specific plans outline arrangements and structures for disaster management, or the hazard, and amongst other things, identify the need for coordination of public communications.

This protocol adds to such plans by outlining specific arrangements necessary when advice to the community needs to be based on technical assessments from hazard-specific primary agencies and other complementary stakeholders across federal, state and local governments.

Factors such as storm surges, tides, creek flooding, flooding from the lower Brisbane River, including Lockyer Creek and the Bremer River, will influence inundation levels in Brisbane.

Wivenhoe Dam controls approximately half of the Brisbane River catchment above Brisbane City. The operational strategy for water release from Wivenhoe and Somerset Dams is governed by the *Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam*, henceforth referred to as the Flood Mitigation Manual.

This protocol also covers the possibility that, during an above-average wet season, the water supply level of the dams may be marginally reduced, on a temporary basis, by small water releases. The water supply level would be returned to normal prior to the conclusion of the wet season, to avoid affecting water supply security. These changes, if they proceed, will ultimately be incorporated into the Flood Mitigation Manual.

GENERAL DECISION MAKING - GUIDING PRINCIPLES

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- Protection of public safety is paramount throughout both this Protocol and the Flood Mitigation Manual;
- Impact on the community upstream or downstream is a legitimate consideration of any risk assessment;
- Regular and consistent communications within government and to the public, in relation to flooding impacts, are essential;
- Decision-making chains regarding the communications strategy and disaster management should remain flexible and highly responsive;
- The Flood Mitigation Manual is used to determine how Wivenhoe and Somerset Dams will be operated during flood events.
- This Protocol does not infringe the right of any party to issue information in line with their responsibilities.

PROCESS OF COMMUNICATION

There are three stages in the process of communication:

- Monitoring and Assessment
- Briefing and Activation
- Public Communications

Monitoring and Assessment

Communications with the public on flooding information, including floodwater releases, are based on a continuous process of monitoring and technical assessment. The process is dynamic and evolves according to the event, but will normally contain the following steps:

- ~~1.~~ Routine monitoring of weather events and dam levels by relevant agencies via established systems and procedures;

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- ~~2.~~ The Bureau of Meteorology (BoM) provides weather forecasts and warnings (e.g. Tropical Cyclone, Severe Weather, Severe Thunderstorm, Flood). In the event of heavy rain and runoff in the Wivenhoe and/or Somerset Dam catchments, BoM and the Queensland Bulk Water Supply Authority (Seqwater) discuss modelled inflows to Wivenhoe and/or Somerset Dam, and downstream flood levels.

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- ~~3.~~ Councils monitor, to the extent that they are able, creek levels, local runoff and flash flooding, consult with BoM and Seqwater on other potential events upstream that may contribute to and aggravate the situation.

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- ~~4.~~ Seqwater discusses and models implications of the inflows on the necessary floodwater release from Wivenhoe Dam and/or Somerset Dam. The floodwater release strategy is a balance between releasing the water quickly enough so that the flood storage capacity is available if another major rain event occurs, versus minimising downstream flooding impacts (human safety and property damage) from the releases.

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- ~~5.~~ Seqwater calculates the floodwater releases according to dam levels and predicted weather events in accordance with the Flood Mitigation Manual. A fundamental principle is that all floodwater should be released from the dams within seven days of the flood event peaking in Wivenhoe or Somerset Dam. This ensures the dams can cope with closely spaced major rain events.

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- ~~6.~~ Seqwater shares predicted floodwater releases with BoM and with the Councils.

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7. Councils with the ability to monitor flooding share information on the status of the Brisbane River catchment and its river systems with each other, BoM, and Seqwater and other councils.

8. BoM undertakes modelling of the Brisbane River catchment and its river systems using Seqwater advice of actual and projected Wivenhoe Dam and/or Somerset Dam releases when these are occurring, or are expected, to occur.

9. BoM participates in technical discussions with Seqwater, Brisbane City Council, Ipswich City Council and Somerset Regional Council as necessary, to share modelling results. The discussions aim to establish a technical agreement on the flood situation, on which public communications should be based.

10. Councils with the necessary resources and expertise undertake modelling, form predictions, identify flood inundation areas and assess impacts for their communities, and regularly share this information with all relevant parties. Councils without the necessary resources and expertise will rely on information from other agencies to complete the impact assessment for their communities.

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During this continuous process, it may become apparent to either BoM, local governments or Seqwater that the situation is likely to result in public safety issues.

These public safety issues may arise from a decision to release floodwater, a significant change in the severity and scope of the event, or a pre-agreed trigger-point being reached.

Any of the agencies may initiate the public communications process and engage with the disaster management arrangements as appropriate.

The trigger points for commencing public communication of flooding information are defined according to an agency's responsibilities.

The initiating agency will instigate a technical staff teleconference. Decisions from the teleconference will be distributed to senior management and media representatives of each agency.

In these circumstances all agencies agree that technical advice will form the basis of public communications messages.

- In the every case of floodwater release it considers significantfrom Wivenhoe or Somerset Dam, Seqwater coordinates the completion of the Technical Situation Report - TSR (Appendix C) and provides the Report to the SEQ Water Grid Manager (according to their Emergency Response Plan), and to relevant local governments.

- In other circumstances where a formal technical statement would enhance clarity, the initiating local or state agency initiating the public communication of flooding information may will pull together relevant information from other agencies in the form coordinate the completion of a TSR. If initiated, the TSR should be circulated to all parties.

Briefing and Activation

If public safety is considered to be at risk, Cconsideration will be given to the

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activation of the disaster management arrangements, if not already activated.

1. Councils will consider activating their Local Disaster Management Groups (LDMGs);

2. LDMGs will inform the relevant District Disaster Coordinators (DDCs);

3. The Queensland Police Service (QPS) will consider initiating disaster management actions as provided for under the *Disaster Management Act 2003*;

4. In the case of floodwater release~~,~~:

   ~~1.~~(a) the SEQ Water Grid Manager will alert the Director-General (DG) of the Department of Community Safety (DCS), DG Department of Environment and Resource Management (DERM), and the local governments~~;~~

   ~~2.~~(b) DG DCS will inform the DG of the Department of Premier and Cabinet (DPC) - the Chair of the State Disaster Management Group (SDMG) and will activate the State Disaster Coordination Centre (SDCC). DG DCS will also inform the Minister for Police, Corrective Services and Emergency Services~~;~~

   ~~3.~~(c) DG DERM will inform the Minister for Natural Resources, Mines and Energy~~;~~

   ~~4.~~(d) DG DPC will inform the Premier;

~~8.~~5. In the case of an extreme event, the Crisis Communications Network, chaired by DPC, may be activated at the direction of the SDMG Chair to coordinate public messaging from BoM, Seqwater, SEQ Water Grid Manager, QPS, relevant Councils and DCS as per this protocol;

~~9.~~6. In the case of a non-disaster, public communications will be in accordance with existing arrangements, supported, where appropriate, by this protocol.

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Public Communications Issues

Each agency has its own responsibilities to issue information commensurate with their role without prior approvals. The obligation under this protocol is to share that information with other agencies and operate in a fully consultative process to ensure consistent public information.

The BoM, Local Governments and relevant State Government agencies ~~are~~ agree to maintain continual discussions, to ensure that conflicting information is not released to the public at any time. Genuine efforts should be made to ensure consistency by basing public communications on technical reports. Inter-agency consultation should not cause delays in the issuance of public warnings. All agencies ~~must~~ agree to exchange public communications at time of release. No power of veto to any organisation is implied under this protocol.

Harmonised public communications messages will be released from the following agencies:

- **Bureau of Meteorology -** concentrating on Flood Warnings which are widely

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disseminated to the BoM website, agencies and the media. BoM also participates in media (radio, television, newspaper) interviews to provide factual information regarding observed and forecast weather conditions, rainfalls and water levels;

- **Local Governments / Local Disaster Management Groups -** concentrating on the effects of weather related events and safety for their local communities and residents, and the impacts on councils' assets. Local governments ~~that have Ppre-agreed scripted c~~Community service announcements from local governments ~~from local governments~~ will be shared ~~be shared~~share ~~these announcements w~~with the relevant agencies, prior to public release if time allows;

- **SEQ Water Grid Manager -** if ~~significant~~ floodwater releases from Wivenhoe and Somerset dams are involved, the SEQ Water Grid Manager concentrates on the communication aspects of release timings and duration of effects as the State's lead communication agency on floodwater release. Seqwater operational staff are to ensure that technical information is communicated to the SEQ Water Grid Emergency Response Team (if activated), the SEQ Water Grid Communications Unit and relevant local governments.

If necessary these will be augmented by:

- **Queensland Police Service** - concentrating on specific community safety messaging during operations;
- **Department of Community Safety** - concentrating on general safety matters regarding flooding;
- **Department of Premier and Cabinet (extreme events only) -** concentrating on consistent messages to media and agencies concerned.

Event-specific information will be released to the public as frequently as required by the severity and scope of the event. Timings of media releases will be dependent on the event, guided by the frequency of technical reports and may range from once a day to once an hour.

In the case of floodwater release ~~considered significant~~from Wivenhoe and/or Somerset Dam, SEQ Water Grid Communications Unit will centrally track all communications and ensure they are shared. The unit will liaise with the following or their representatives over pubic safety messages:

- BoM;
- Seqwater;
- Councils' Media Directors;
- QPS Media Director; and
- DCS Media Director.

Questions from the Public

All questions from the public should be directed to the relevant local government in the first instance. Questions expressly relating to the event should be directed to the hazard-specific primary agency. Any questions relating to the release of floodwater should be directed to the SEQ Water Grid Communications Unit. Any queries about disaster management should be addressed by the relevant local and district disaster management groups.

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Protocol Maintenance

This protocol will be reviewed annually by agencies involved and exercised, during non-operational season, under DDMG arrangements.

The protocol should provide for a review after each event of what worked and could be improved for management of future events, to be led by DCS.

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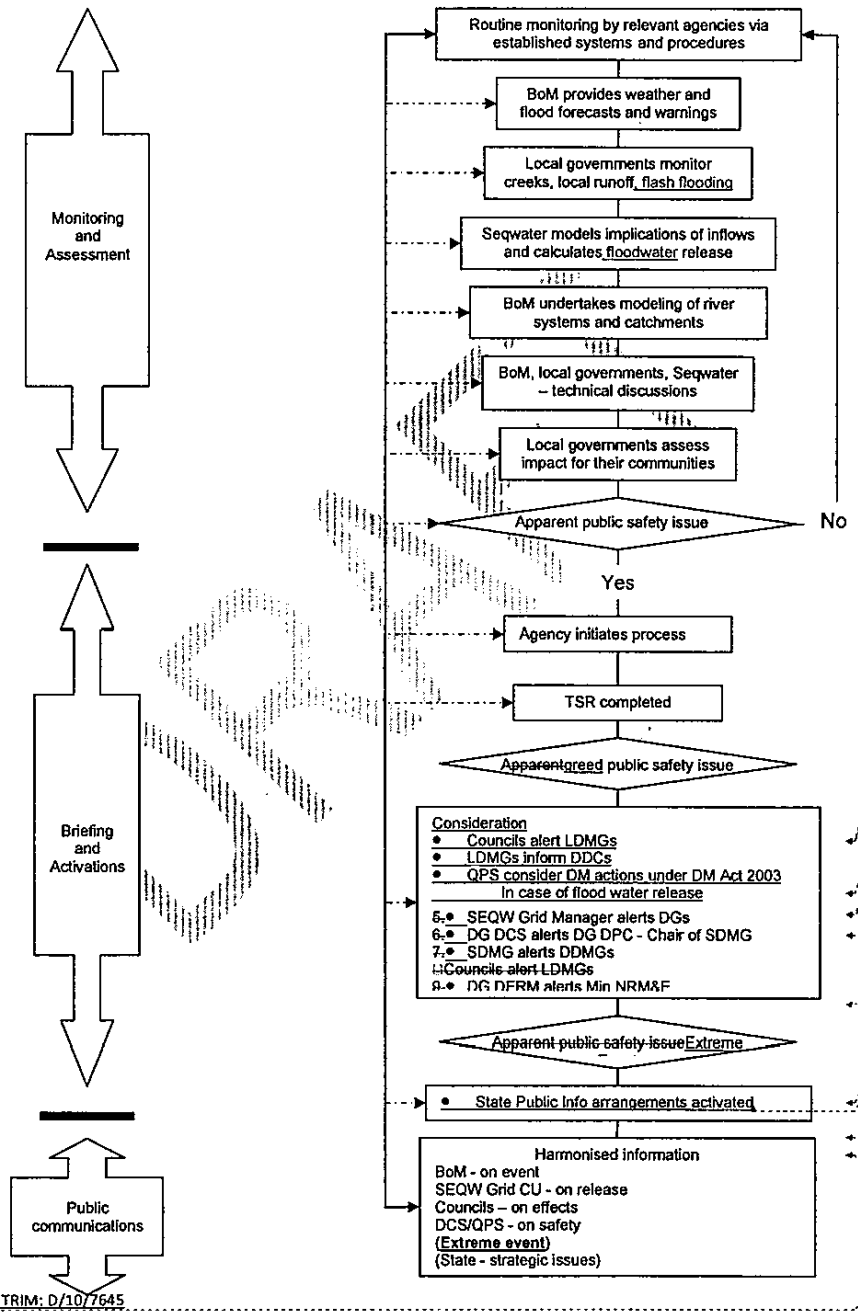
Appendix A

Communications process for the release of floodwater from Wivenhoe and Somerset Dams



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WGM TRIM: D/10/7645

Appendix B

ROLES AND RESPONSIBILITIES

- The Bureau of Meteorology (BoM) is the agency responsible for issuing flood warnings for the Brisbane River and its major tributaries. These, when required, include rainfall forecasts for the Brisbane catchment and predicted river heights for Brisbane City, Ipswich, Jindalee and Moggill according to established procedures.

  River height predictions are agreed in consultation with Seqwater, Brisbane City Council (BCC), Ipswich City Council (ICC) and Somerset Regional Council (SRC), as required.

- Queensland Bulk Water Supply Authority (Seqwater) operates Wivenhoe and Somerset Dams in accordance with the Flood Mitigation Manual. It provides dam outflow information to BoM, to allow the development of Flood Warnings and to local authorities, to assist them in quantifying likely impacts within their areas.

  It informs BoM and other agencies on the status of dams, and actual and projected releases from Wivenhoe and Somerset dams. It consults BoM regarding inflows to Wivenhoe and Somerset dams and expected flood heights along the Brisbane River downstream of Wivenhoe Dam.

  Seqwater initiates proposed reviews or updates to the Flood Mitigation Manual, undertaking consultation with Councils and other stakeholders. Seqwater coordinates the production of the TSRs relating to floodwater releases from the Wivenhoe and Somerset dams.

- Brisbane City Council (BCC), Ipswich City Council (ICC) and Somerset Regional Council (SRC) distribute consistent, detailed local flood level information, both to their respective operational units, their senior management and their broader communities. This should include the interpretation of BoM flood warnings and river height forecasts into expected areas and depths of inundation. Councils are responsible for activating their respective Local Disaster Management Groups (LDMGs), which then undertake the disaster management responsibility for response in the community.

- Department of Environment and Resource Management (DERM) consults with the stakeholders prior to the approval of any updates to the Flood Mitigation Manual. DERM also approves any necessary variations to the strategies in the manual if required during the course of a flood event.

- Queensland Police Service (QPS) assumes a legislative role, as per the disaster management system, to provide disaster management at a district level during an event, including provision of necessary community advice for public safety.

- Emergency Management Queensland (EMQ) provides support and general community safety advice on flooding issues, during non-operational times.

- SEQ Water Grid Manager in the case of floodwater release alerts the Director-General (DG) of the Department of Community Safety (DCS), DG Department of Environment and Resource Management (DERM), and the local governments.

- SEQ Water Grid Communications Unit tracks the general harmonisation, but not specific detail of public messaging relating to floodwater releases, with BoM, SEQ Water Grid, Councils and DCS, as required. It does this by ensuring that each agency understands the extent of the release and that there is a general consensus as to the level of potential impacts.

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Appendix C

TECHNICAL SITUATION REPORT

TSR Number		Date of TSR release		Time of TSR release	

This report is as at the time of assessment, and may quickly become out of date, depending on the current events. It relies on timely information provided by Seqwater, BoM and Councils. A reply will be required by a specified time and if not received by that time no information will be included. If any information is not provided, the section will remain blank. There will be no follow up requests.

Each authority will provide an email and telephone contact for all communications. If an event escalates, there may be less time to respond or it may not be possible to respond to requests.

In floodwater releases Seqwater will email advices on releases to the organisations email address provided. Once a flood event is initiated, at any time a Council or agency can contact Seqwater to discuss if they have a serious concern regarding the information on releases provided. This would normally be by phone and followed by email. However, the ability to respond to any queries depends on the event. The frequency of advices will depend on the severity of the event and the needs of each agency.

Seqwater will also request at that time, a situation assessment from each agency as per details outlined in this document. Each agency will then email in return the requested information if possible or advice that it has not changed. If it is not received within the specified timeframe, it is assumed it is not being provided.

~~These illustrative triggers provide guidance to initiation of this report~~	

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Seqwater status of inflows and dam operations

(to include information on the current and/or predicted levels of Somerset and Wivenhoe Dams and the probable or planned release strategy with assessment as governed under the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam)

This is Seqwater's status report on the dam levels, probable inflows and planned releases.

.....

This has been supplied to
BCC on .....
ICC on .....
SRC on .....

Issues raised by Councils were .....

Actions taken were .....

Seqwater Technical Officer name	
Seqwater Technical Officer position title	
Seqwater Technical Officer contact details	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM is to provide either a copy of, or links to, their current information and other updates or comments if needed. This will be their current set of warnings and may be updated or changed at any time.

BoM Technical Officer name	
BoM Technical Officer position title	
BoM Technical Officer contact details	

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Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

This is an assessment as provided by BCC. A request for this information will be sent to the email address provided by BCC.

BCC Technical Officer name	
BCC Technical Officer position title	
BCC Technical Officer contact details	

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

This is an assessment as provided by ICC. A request for this information will be sent to the email address provided by ICC.

ICC Technical Officer name	
ICC Technical Officer position title	
ICC Technical Officer contact details	

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

This is an assessment as provided by SRC. A request for this information will be sent to the email address provided by SRC.

SRC Technical Officer name	
SRC Technical Officer position title	
SRC Technical Officer contact details	

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	
Contact Officer position title	

Next TSR due	Date		Time		or Event

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Barry Dennien

From: Barry Dennien
Sent: Friday, 3 December 2010 2:50 PM
To: Scott Denner
Subject: RE: Protocol for Flood Releases from Wivenhoe

Open the document and search for "pubic"

From: Scott Denner
Sent: Friday, 3 December 2010 2:12 PM
To: Barry Dennien; Chris Owens; Storm Stickland; Peter Wyllie; Lee Hutchison; Grant Horton; Shion Yee; Cliff Horwood; Dan Spiller; Michael Lyons; Joanne Collins; Elaina Smouha; Andrew Musgrave; Aleisha Coote; Shelley Banks; Jade Simmons
Subject: Protocol for Flood Releases from Wivenhoe

Duty Execs/Emergency Managers/Communications Managers,

Following the last flood release from Wivenhoe Dam, a determination was made that a greater degree of cooperation was required between the Federal, State and Local government agencies involved, both to collaboratively determine likely impacts and inform the public in a coherent manner.

The Protocol has been developed to final draft stage. It is unlikely to be fully confirmed prior to Christmas, and as such, the Premier has requested of the parties involved that we utilise the protocol in its current draft format until the final version is approved.

The WGM plays a key role in notifying a range of agencies if a release is planned, as well as aligning the public communications between State and Local Government agencies.

Please familiarise yourself with the draft policy (attached). A hard copy of it will be included in the Duty Manager Pack (pls Lee)

Thanks

Scott

Scott Denner
Director Risk and Technology
SEQ Water Grid Manager
Ph: 0061 (07) 3404 0798 | Fax: 0061 (07) 3405 0373
Email: scott.denner@seqwgm.com.au
Post: PO Box 16205, BRISBANE CITY EAST, QLD 4002
Visit: Level 15, 53 Albert St, BRISBANE
ABN: 14783 317 630

Barry Dennien

From: Barry Dennien
Sent: Friday, 3 December 2010 3:06 PM
To: 'Rob Drury'; Jim Pruss
Cc: Peter Borrows; Dan Spiller
Subject: RE: Dam levels - Investigation
Attachments: image001.gif; image003.jpg; image004.png

Rob

Thanks for the report. Thanks for the additional BOM advice.

I note the good work on modelled sensitivities for flows below 1900m3/sec – W1 strategy (flood manual)

The report then jumps to greater than 3500m3/sec (W4 strategy) and comments how peak water levels would unlikely be impacted and it comments that dam volume reductions of 250,000 megalitres (reduction 20% dam level) would be needed for any significant reduction in water level peaks.

Q1. Was the >3500m3/sec modelled like the October event < 1900M3/sec to draw the above conclusions.

Q2. Was the flow between 1900 and 3500 m3/sec modelled (Strategy W2 W3) with various dam levels to ascertain benefits to peak levels or bridge outage durations

Q3. If no to 1 and 2 is it worth doing considering we make the comments above about maybe a benefit if we have 250,000 ML extra storage.

Regards

Barry

From: Rob Drury [mailto:rdrury@seqwater.com.au]
Sent: Thursday, 2 December 2010 3:11 PM
To: Barry Dennien; Jim Pruss
Cc: Peter Borrows
Subject: RE: Dam levels - Investigation

Barry,
Attached is our DRAFT reply on possibility and impact of lowering dam levels on floods for your review and any comments.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

Ph (07) 54278131 | Fax (07) 54261097 | M 0419378740 | E rdrury@seqwater.com.au
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Barry Dennien [mailto:Barry.Dennien@seqwgm.com.au]
Sent: Wednesday, 1 December 2010 11:56 AM
To: Jim Pruss; Rob Drury
Subject: Dam levels - Investigation

Jim Rob

Hope all is well.

Just following up on our discussions with regards dam levels and flood impacts. Anything I can do to help?

We are due to get back to the Minister by the end of November.

Regards

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
Phone: (07) 3033 0785 | **Fax:** (07) 3405 0373 | **Mobile:** 0419725708
mail: barry.dennien@seqwgm.com.au
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Barry Dennien

From: Scott Denner
Sent: Friday, 3 December 2010 4:08 PM
To: Barry Dennien
Subject: RE: Protocol for Flood Releases from Wivenhoe

Already done – I notified EMQ of our new, public health responsibilities...

SD

Scott Denner
Director Risk and Technology
SEQ Water Grid Manager
Ph: 0061 (07) 3404 0798 | Fax: 0061 (07) 3405 0373
Email: scott.denner@seqwgm.com.au
Post: PO Box 16205, BRISBANE CITY EAST, QLD 4002
Visit: Level 15, 53 Albert St, BRISBANE
ABN: 14783 317 630

From: Barry Dennien
Sent: Friday, 3 December 2010 2:50 PM
To: Scott Denner
Subject: RE: Protocol for Flood Releases from Wivenhoe

Open the document and search for "pubic"

From: Scott Denner
Sent: Friday, 3 December 2010 2:12 PM
To: Barry Dennien; Chris Owens; Storm Stickland; Peter Wyllie; Lee Hutchison; Grant Horton; Shion Yee; Cliff Horwood; Dan Spiller; Michael Lyons; Joanne Collins; Elaina Smouha; Andrew Musgrave; Aleisha Coote; Shelley Banks; Jade Simmons
Subject: Protocol for Flood Releases from Wivenhoe

Duty Execs/Emergency Managers/Communications Managers,

Following the last flood release from Wivenhoe Dam, a determination was made that a greater degree of cooperation was required between the Federal, State and Local government agencies involved, both to collaboratively determine likely impacts and inform the public in a coherent manner.

The Protocol has been developed to final draft stage. It is unlikely to be fully confirmed prior to Christmas, and as such, the Premier has requested of the parties involved that we utilise the protocol in its current draft format until the final version is approved.

The WGM plays a key role in notifying a range of agencies if a release is planned, as well as aligning the public communications between State and Local Government agencies.

Please familiarise yourself with the draft policy (attached). A hard copy of it will be included in the Duty Manager Pack (pls **Lee**)

Thanks

Scott

Scott Denner

Director Risk and Technology
SEQ Water Grid Manager
Ph: 0061 (07) 3404 0798 | Fax: 0061 (07) 3405 0373
Email: scott.denner@seqwgm.com.au
Post: PO Box 16205, BRISBANE CITY EAST, QLD 4002
Visit: Level 15, 53 Albert St, BRISBANE
ABN: 14783 317 630

Barry Dennien

From: Mike Foster [mfoster@seqwater.com.au]
Sent: Sunday, 5 December 2010 10:30 AM
To: Barry Dennien
Subject: Fw: Update
Attachments: image001.jpg; image002.png

Fyi

From: Mike Foster
To: 'Geoff.Stead@ministerial.qld.gov.au' <Geoff.Stead@ministerial.qld.gov.au>; 'michael.lyons@seqwgm.qld.gov.au' <michael.lyons@seqwgm.qld.gov.au>; 'media@seqwgm.qld.gov.au' <media@seqwgm.qld.gov.au>; Paul Bird
Sent: Sun Dec 05 09:12:42 2010
Subject: Fw: Update

Fyi

From: Rob Drury
To: Mike Foster; Paul Bird
Cc: Jim Pruss; Peter Borrows
Sent: Sun Dec 05 07:44:20 2010
Subject: Update

North Pine Dam was closed around 7am this morning after about 4,000ML was released. Fish recovery is proceeding. So far only returned 4 lungfish back to water. No deaths so far, but they will have a walk downstream to check in case an occasional got trapped or hit something. Young's Crossing will be open later this morning so should not be much disruption. Then will probably open a cone valve to keep level down hence it could be open for tomorrow's visit.

Mike,
Hence we will stick to tod deck rather than go down bottom as it would be wet and muddy.
Can you make sure the Ministers office and WGM people know where to come, I will meet anyone at the electric gate as you enter dam wall.

There are only minor inflows into Somerset and Wivenhoe is fairly steady.

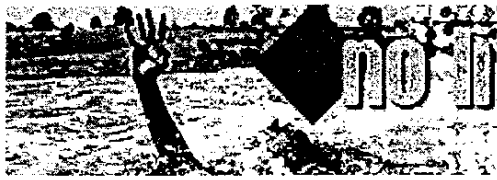
Leslie Harrison went up but was fine however there is rain going over at the moment so we will monitor.

Hinze is rising and the Alliance will no doubt increase gate release as per plan to lower level back to 82.2m.

Over 24 hours about 20 to 40mm around North Pine, 35mm around Wivenhoe and 20 to 35mm around Somerset but varied considerably.
Down southern part of Gold Coast 50mm to 120mm hence Hinze inflows.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and f
flowing water is FAT

rethink

seqwater
WATER FOR LIFE

Ph (07) 54278131 | Fax (07) 54261097 | M 0419378740 | E rdrury@seqwater.com.au
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Barry Dennien

From: Andrew Musgrave
Sent: Tuesday, 7 December 2010 7:11 AM
To: Michael Lyons; Barry Dennien
Subject: Dam update - trickling in
Attachments: image001.gif

Importance: High

Dear Barry

Have just spoken to Paul Bird (Seqwater) on the train and he has told me the following:
(I cannot get Mike Foster on the phone as of yet)

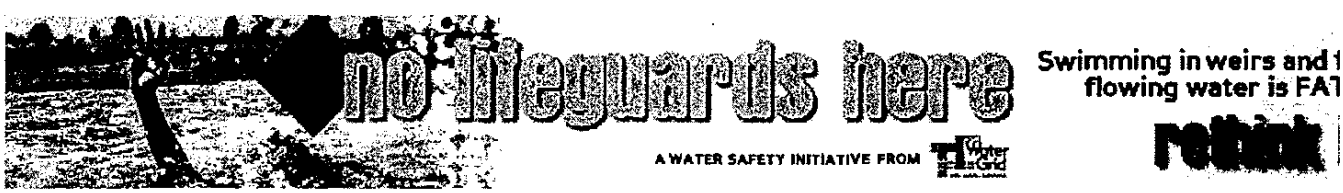
- Somerset Dam has had some inflows from surrounding catchment and may be releasing into Wivenhoe later today
- Leslie Harrison Dam is currently releasing
- North Pine Dam has had all 5 gates open and releasing since lunchtime yesterday
- Moogerah Dam is now spilling for the first time in many years

He is coming back to me with the rest of your figures before 7:30am.

Regards

AjM

Andrew Musgrave
Communications Officer
SEQ Water Grid Communications Unit
SEQ Water Grid Manager
Phone: (07) 3405 4990 | Fax: (07) 3405 0373
Email: andrew.musgrave@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630



Barry Dennien

From: Kevin Flanagan [Kevin.Flanagan@toowoombaRC.qld.gov.au]
Sent: Tuesday, 7 December 2010 11:43 AM
To: Andrew.Moir@linkwater.com.au
Cc: Peter.McManamon@linkwater.com.au; Alan Kleinschmidt; Laurie Ashe; Yvette Skinner; Michael.Hortz@linkwater.com.au; Matt.Andrew@linkwater.com.au; Barry Dennien
Subject: Wivenhoe to Cressbrook Pumping Regime

Morning Andrew,

As the result of rainfall recieved over the weekend of 4 - 5 December 2010, the combined storage in Cressbrook and Perseverence Dams reached 35.4%, adjusted for Wivenhoe pumping inflows. Under the terms of the Moreton Resource Operations Plan, Toowoomba Regional Council is required to release environmental water from Cressbrook Dam, subject to other trigger points such as gauged downstream flows and weir levels, when the combined storage of Cressbrook and Perseverance Dams exceeds 35%.

You are therefore requested the cease the current Wivenhoe to Cressbrook pumping regime as of COB Tuesday 7 December 2010. Until further notice, turnover pumping only is to be conducted in accordance with the following schedule:

Frequency: Once every 10 days
Duration: 9.00 pm to 7.00 am

As the pipeline discharges into Cressbrook Dam through the same pipework that is used for environmental flows releases, please contact Manager Water Operations Alan Kleinschmidt at least 24 hrs prior to starting turnover pumping to ensure there is no conflict with potential environmental releases.

Toowoomba Regional Council will provide the Water Grid Manager with an amended Monthly Customer Demand Forecast Notice as required under the terms of our Grid Contract Document.

If you require further information, please contact Alan Kleinschmidt, Manager Water Operations, on telephone (07) 4688 6975 or email alan.kleinschmidt@toowoombaRC.qld.gov.au.

Regards

Kevin Flanagan
Director Water Services
Toowoomba Regional Council
T: 07 4688 6702
F: 07 46319155
M: 0417 882 499
E: Kevin.Flanagan@toowoombaRC.qld.gov.au
W: http://www.toowoombaRC.qld.gov.au/
Toowoomba Regional Council
PO Box 3021, Toowoomba Village Fair QLD 4350

Local People, Local Service

Barry Dennien

From: Aleisha Coote
Sent: Tuesday, 7 December 2010 12:12 PM
To: Barry Dennien
Cc: Michael Lyons
Subject: 7 News media enquiry
Attachments: image001.gif

Hi Barry

Please note below our response to the 7 News media enquiry that has come through. This has been signed off by Seqwater and Mike. As the spokesperson on this matter, can you confirm that you are happy with content?

Can you give us an idea of when the dam releases will be? I hear Somerset and the cone valve at Wivenhoe? Is this right??

We currently have one cone valve open at Somerset Dam, releasing approximately 6,000 megalitres of water per day into Wivenhoe Dam.

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Water is also being released through the Hinze Dam outlet gates, with approximately 5,000 per day being released.

Releases from North Pine Dam and Leslie Harrison Dam will cease today.

All release information changes on a daily basis, dependent on catchment inflows.

Thanks
Aleisha

Aleisha Coote
Senior Media Advisor
SEQ Water Grid Communications Unit
Phone: (07) 3224 7212 | Fax: (07) 3405 0373
Email: aleisha.coote@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

From: Cummins, Talitha [mailto:TCummins@seven.com.au]
Sent: Tuesday, 7 December 2010 10:38 AM
To: SEQWGM Media
Subject: Dam release

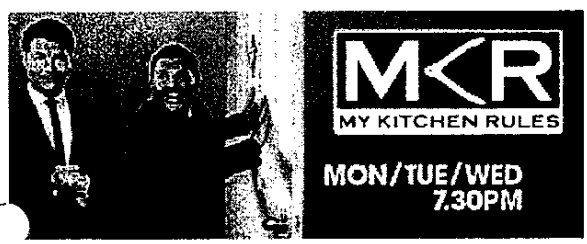
Good morning - just wondering if someone can give us an idea of when the dam releases will be????

I hear somerset and the cone valve at wivenhoe? is this right??

Kind regards

Talitha Cummins
Journalist / Presenter | 7 NEWS

Seven Network (Operations) Limited
Sir Samuel Griffith Drive | Mt Coot-tha | Brisbane QLD 4066 Australia
Postal Address: GPO Box 604 | Brisbane QLD 4001 Australia
Telephone +61 7 3368 7320 | Facsimile +61 7 3368 2973 | Mobile +61 437 447 787



Barry Dennien

From: Barry Dennien
Sent: Tuesday, 7 December 2010 12:14 PM
To: Dan Spiller
Subject: Fwd: Actual v's Pre-drought Business As Usual comparison
Attachments: ATT00001.htm

Dan we need this run done

Regards
Barry Dennien

Begin forwarded message:

> **From:** "Jamie Quinn" <jamie@jamiequinn.com.au>
> **To:** "Barry Dennien" <Barry.Dennien@seqwgm.com.au>
> **Cc:** "Gary Humphrys" <Gary.Humphrys@seqwgm.com.au>, "Jamie Quinn" <jamie@jamiequinn.com.au>, "Dan Spiller" <Daniel.Spiller@seqwgm.com.au>
> **Subject: FW: Actual v's Pre-drought Business As Usual comparison**
>
> Barry,
>
> In view of the CM's editorial headline today, it may be prudent for modelling to be available to demonstrate the result of the supply and demand management actions taken by Government, ie the differential between what happened and what would have happened if it had been 'business as usual' on the supply and demand sides of the equation.
>
> I assume the Minister's office has already asked the QWC for this.
>
> Regards,
>
> Jamie Quinn
> (T) 07 3389 4790; (M) 0437 003556
> (Email) jamie@jamiequinn.com.au<mailto:jamie@jamiequinn.com.au>
>
> From: Dan Spiller [mailto:Daniel.Spiller@seqwgm.com.au]
> Sent: Monday, 22 November 2010 3:19 PM
> To: Jamie Quinn; Barry Dennien
> Cc: Gary Humphrys
> Subject: RE: Actual v's Pre-drought Business As Usual comparison
>
> Jamie,
>
> I couldn't find the slide I was thinking of, but the attached goes some way there.
>
> I will get the modellers to make up the slide you were thinking of.
>
> Dan
>
> From: Jamie Quinn [mailto:jamie@jamiequinn.com.au]
> Sent: Monday, 22 November 2010 2:06 PM
> To: Barry Dennien

Cc: Gary Humphrys; Dan Spiller; Jamie Quinn
Subject: Actual v's Pre-drought Business As Usual comparison

Barry,

During the Board meeting on 18.11.10, we discussed facts to support/demonstrate the effectiveness of the water security strategy in SEQ. As I mentioned, water demand management has been an essential element of the water security equation. Dan mentioned he may have a slide that demonstrates the actual verses pre-drought business as usual dam supply levels.

I would be interested to see that slide if it is available. The SEQ Water Grid communications strategy should be endeavouring to convey a comprehensive picture so that short memories are continually jolted with strikes of reality. The reality is that 2 million people could have run out of water if a whole raft of actions had not been taken by the Qld Government in partnership with the SEQ community.

Thanks,

Jamie Quinn
(T) 07 3389 4790; (M) 0437 003556
(Email) jamie@jamiequinn.com.au<mailto:jamie@jamiequinn.com.au>

Barry Dennien

From: Andrew Moir [Andrew.Moir@linkwater.com.au]
Sent: Tuesday, 7 December 2010 12:31 PM
To: Kevin Flanagan
Cc: Peter McManamon; Alan Kleinschmidt; Laurie Ashe; Yvette Skinner; Michael Hortz; Matt Andrew; Barry Dennien; Chris Evans; Steve Pickering
Subject: RE: Wivenhoe to Cressbrook Pumping Regime
Attachments: ~WRD000.jpg; image001.jpg

Thanks Kevin, I have passed on your instructions to our Operations Group for action.

Cheers

Andrew

LinkWater
The Queensland Bulk Water Transport Authority

Andrew Moir
General Manager Operational Services

p (07) 3270 4037 | **f** (07) 3270 4020 | **m** 0439 732 210
Level 5, 200 Creek Street | PO Box 1045 | Spring Hill Qld 4004
e andrew.moir@linkwater.com.au | **w** www.linkwater.com.au

From: Kevin Flanagan [mailto:Kevin.Flanagan@toowoombaRC.qld.gov.au]
Sent: Tuesday, December 07, 2010 11:43 AM
To: Andrew Moir
Cc: Peter McManamon; Alan Kleinschmidt; Laurie Ashe; Yvette Skinner; Michael Hortz; Matt Andrew; Barry.Dennien@seqwgm.com.au
Subject: Wivenhoe to Cressbrook Pumping Regime

Morning Andrew,

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If you require further information, please contact Alan Kleinschmidt, Manager Water Operations, on telephone (07) 4688 6975 or email alan.kleinschmidt@toowoombaRC.qld.gov.au.

Regards

Kevin Flanagan
Director Water Services
Toowoomba Regional Council
T: 07 4688 6702
F: 07 46319155
M: 0417 882 499
E: Kevin.Flanagan@toowoombaRC.qld.gov.au
W: http://www.toowoombaRC.qld.gov.au/
Toowoomba Regional Council
PO Box 3021, Toowoomba Village Fair QLD 4350

Local People, Local Service

Barry Dennien

From: Barry Dennien
Sent: Tuesday, 7 December 2010 12:38 PM
To: Aleisha Coote
Cc: Michael Lyons
Subject: RE: 7 News media enquiry
Attachments: image001.gif

Aleisha you may want to rewrite my edits

From: Aleisha Coote
Sent: Tuesday, 7 December 2010 12:12 PM
To: Barry Dennien
Cc: Michael Lyons
Subject: 7 News media enquiry

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Postal Address: GPO Box 604 | Brisbane QLD 4001 Australia
Telephone +61 7 3368 7320 | Facsimile +61 7 3368 2973 | Mobile +61 437 447 787

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From: Aleisha Coote
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To: Barry Dennien
Cc: Michael Lyons
Subject: RE: 7 News media enquiry
Attachments: image001.gif

Will do, thanks Barry

Aleisha Coote
Senior Media Advisor
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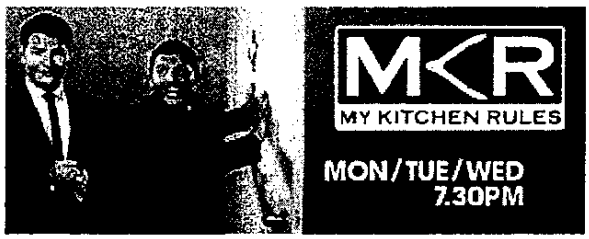

Ph (07) 54278131 | Fax (07) 54261097 | M 0419378740 | E rdrury@seqwater.com.au

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306

Website | www.seqwater.com.au

From: Barry Dennien [mailto:Barry.Dennien@seqwgm.com.au]
Sent: Wednesday, 8 December 2010 8:23 AM
To: Jim Pruss; Rob Drury
Cc: Dan Spiller; Peter Borrows
Subject:

Hi Jim Rob

The Minister is attending our Board meeting this Monday and given the public debate on Wivenhoe levels is very much front of mind (attached) he will ask on the status of the modelling work. I received your update the other day thankyou, I had a few extra questions, is there any chance on your thoughts before Monday, not necessarily any new model runs before then.

Regards

Barry

Rob

Thanks for the report. Thanks for the additional BOM advice.

I note the good work on modelled sensitivities for flows below 1900m3/sec â€“ W1 strategy (flood manual)

The report then jumps to greater than 3500m3/sec (W4 strategy) and comments how peak water levels would unlikely be impacted and it comments that dam volume reductions of 250,000 megalitres (reduction 20% dam level) would be needed for any significant reduction in water level peaks.

Q1. Was the >3500m3/sec modelled like the October event < 1900M3/sec to draw the above conclusions.

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Regards

Barry

Barry Dennien

From: Barry Dennien
Sent: Wednesday, 8 December 2010 8:23 AM
To: Jim Pruss; 'Rob Drury'
Cc: Dan Spiller; 'Peter Borrows'
Attachments: SEQ Water Grid Media Report - 8 December 2010 (2)

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Regards

Barry

SEQ Water Grid Media Report - 8 December 2010

AM Radio

▶ **4BC (Brisbane)**
Greg Cary Morning Show - 7/12/2010 9:41 AM
Gary Hardgrave
Station Phone 07 3908 8200

Audience	
Male 16+:	16,000
Female 16+:	19,000
All People:	35,000
Advertising Space Rate	
AUD:	6,778

Hardgrave speaks to Jeff Seeney, Shadow Minister for Natural Resources, Mines and Energy who says the Government tries to mislead the people of SE Qld about how full Wivenhoe Dam is. Seeney points out that Wivenhoe is a flood buffer, so when the Qld Government says it is full, it is only 40% full. Hardgrave talks about a report that suggested water managers could increase the capacity of Wivenhoe by a few metres, but Seeney says this has not been done. Hardgrave talks about the multi-billion dollar water grid, saying it is a good investment if water can be shared around with places such as Toowoomba. Seeney says Toowoomba Dam is not full, though it should be, and says the real issue was the fact that SEQ was charging Toowoomba city an exorbitant amount for water.

Interviewees: Jeff Seeney, Shadow Minister for Natural Resources, Mines and Energy
Duration: 5.32
Summary ID: W00041675642
This program or part thereof is syndicated to the following 6 station(s):-
4BU (Bundaberg), 4LG (Longreach), 4RO (Rockhampton), 4VL (Charleville), 4WK (Toowoomba), Radio 4KZ (Innisfail)

▶ **4BC (Brisbane)**
Greg Cary Morning Show - 7/12/2010 10:48 AM
Gary Hardgrave
Station Phone 07 3908 8200

Audience	
Male 16+:	12,000
Female 16+:	18,000
All People:	30,000
Advertising Space Rate	
AUD:	1,155

Hardgrave says that Stephen Robertson, Queensland Minister for Natural Resources contacted the programme to say that Toowoomba Mayor Peter Taylor was told in October that Toowoomba can have as much water as it wants at no charge any time Wivenhoe spills over. Also, because it has an independent contract with Origin Energy, the Toowoomba Regional Council remains liable for the cost of electricity required to pump the water to its dam.

Duration: 1.06
Summary ID: W00041676979
This program or part thereof is syndicated to the following 6 station(s):-
4BU (Bundaberg), 4LG (Longreach), 4RO (Rockhampton), 4VL (Charleville), 4WK (Toowoomba), Radio 4KZ (Innisfail)

▶ **4BC (Brisbane)**
Greg Cary Morning Show - 7/12/2010 11:07 AM
Gary Hardgrave
Station Phone 07 3908 8200

Audience	
Male 16+:	12,000
Female 16+:	18,000
All People:	30,000
Advertising Space Rate	
AUD:	2,065

Hardgrave appeals to the office of Stephen Robertson, Queensland Minister for Natural Resources, to fill Toowoomba's dams instead of pumping water out to sea. He reads a listener email which suggests filling Toowoomba's dams by pumping is as effective as 'urinating in the ocean'. The email mentions the last Wivenhoe Dam discharge and says the water grid is more effective in perception that reality. Hardgrave says the perception has cost six million dollars.

Duration: 1.58
Summary ID: W00041676847
This program or part thereof is syndicated to the following 6 station(s):-
4BU (Bundaberg), 4LG (Longreach), 4RO (Rockhampton), 4VL (Charleville), 4WK (Toowoomba), Radio 4KZ (Innisfail)

▶ **4BC (Brisbane)**
Greg Cary Morning Show - 7/12/2010 11:13 AM
Gary Hardgrave
Station Phone 07 3908 8200

Audience	
Male 16+:	12,000
Female 16+:	18,000
All People:	30,000
Advertising Space Rate	
AUD:	2,520

Caller Ian explains his understanding of why water can not be pumped from Wivenhoe Dam to Toowoomba's dams. He says pumping water is a 'terribly expensive operation'. Hardgrave challenges Anna Bligh to 'please explain' why the water grid does not work.

Duration: 2.24
Summary ID: W00041677209
This program or part thereof is syndicated to the following 6 station(s):-
4BU (Bundaberg), 4LG (Longreach), 4RO (Rockhampton), 4VL (Charleville), 4WK (Toowoomba), Radio 4KZ (Innisfail)

▶ **4BC (Brisbane)**
11:00 News - 7/12/2010 11:00 AM
Newsreader
News Director Mr Chris Adams 07 3908 8244

Audience	
Male 16+:	12,000
Female 16+:	18,000
All People:	30,000
Advertising Space Rate	
AUD:	752

Jeff Seeney, Shadow Minister for Mines and Energy, has accused the government of masking water levels at Wivenhoe Dam.

Interviewees: Jeff Seeney, Shadow Minister for Mines and Energy
Duration: 0.43
Summary ID: W00041677042
This program or part thereof is syndicated to the following 5 station(s):-
1071 AM (Kingaroy), 4BH (Brisbane), 4CRB FM (Gold Coast), 4LG (Longreach), Radio 4KZ (Innisfail)

▶ **4BC (Brisbane)**
Greg Cary Morning Show - 7/12/2010 11:11 AM
Gary Hardgrave
Station Phone 07 3908 8200

Audience	
Male 16+:	12,000
Female 16+:	18,000
All People:	30,000
Advertising Space Rate	
AUD:	1,190

Hardgrave talks about the different views of Jeff Seeney, Opposition Spokesman, and Stephen Robertson, Queensland Minister for Natural Resources, regarding water levels in the Wivenhoe Dam. He questions why the Queensland Government are afraid to review water management strategies formulated in the '70s.

Duration: 1.08
Summary ID: W00041677155
This program or part thereof is syndicated to the following 6 station(s):-
4BU (Bundaberg), 4LG (Longreach), 4RO (Rockhampton), 4VL (Charleville), 4WK (Toowoomba), Radio 4KZ (Innisfail)

▶ **4BC (Brisbane)**
Greg Cary Morning Show - 7/12/2010 11:09 AM
Gary Hardgrave
Station Phone 07 3908 8200

Audience	
Male 16+:	12,000
Female 16+:	18,000
All People:	30,000
Advertising Space Rate	
AUD:	1,452

Caller Will and Hardgrave discuss having to pay extra for power in Toowoomba. Hardgrave says Toowoomba's dams should be filled before water from the Wivenhoe is released into the sea.

Duration: 1.23
Summary ID: W00041677114
This program or part thereof is syndicated to the following 6 station(s):-
4BU (Bundaberg), 4LG (Longreach), 4RO (Rockhampton), 4VL (Charleville), 4WK (Toowoomba), Radio 4KZ (Innisfail)

▶ **4GR (Toowoomba)**
07:30 News - 7/12/2010 7:32 AM
Newsreader
News Director Ms Missy Burrell 07 5591 4999

Audience	
Male 16+:	4,400
Female 16+:	5,100
All People:	9,500
Advertising Space Rate	
AUD:	174

ed the level of Toowoomba's dams to 35.6% allowing for a drop in water restrictions.

Interviewees: Paul Antonio, Toowoomba Regional Councillor
Duration: 0.31
Summary ID: W00041672876
This program or part thereof is syndicated to the following 1 station(s):-
C FM Toowoomba (Toowoomba)

▶ **4GR (Toowoomba)**
08:30 News - 7/12/2010 8:33 AM
Newsreader
Station Phone 07 4632 3333

Audience	
Male 16+:	4,200
Female 16+:	4,700
All People:	8,900
Advertising Space Rate	
AUD:	184

Recent rains have put Toowoomba's combined dam levels at an even higher level. Paul Antonio, Deputy Mayor, Toowoomba Regional Council, says residents will be able to be more free with how they use their water.

Interviewees: Paul Antonio, deputy mayor, Toowoomba Regional Council
Duration: 0.35
Summary ID: W00041674512
This program or part thereof is syndicated to the following 1 station(s):-
C FM Toowoomba (Toowoomba)

▶ **4WK (Toowoomba)**
11:00 News - 7/12/2010 11:01 AM
Newsreader
Station Phone 07 4632 9999

Audience	
Male 16+:	300
Female 16+:	1,200
All People:	1,500
Advertising Space Rate	
AUD:	47

Qld Shadow Minister for Mines and Energy Jeff Seeney has accused the Qld Government of being deceptive about water levels at Wivenhoe Dam.

Interviewees: Jeff Seeney, Qld Shadow Minister for Mines and Energy
Duration: 0.44
Summary ID: W00041677671

▶ **ABC 612 Brisbane (Brisbane)**
06:30 News - 8/12/2010 6:32 AM
Newsreader
Executive Producer Ms Maree Hawthorne 07 3377 5244

Audience	
Male 16+:	27,000
Female 16+:	24,000
All People:	53,000
Advertising Space Rate	
AUD:	958

Queensland Urban Utilities plans to slash water prices in the Southeast by $10 in 2011. Chairwoman of QUU, Jude Munro, says savings for households will rise to $20 in the 2012-13 financial year.

Interviewees: Jude Munro, Chairwoman, Queensland Urban Utilities
Duration: 0.44
Summary ID: W00041688637

▶ **ABC 612 Brisbane (Brisbane)**
Drive - 7/12/2010 3:22 PM
Kelly Higgins-Devine
Presenter Ms Kelly Higgins-Devine 07 3377 5235

Audience	
Male 16+:	10,000
Female 16+:	12,000
All People:	22,000
Advertising Space Rate	
AUD:	389

News Headlines: - The Reserve Bank has kept interest rates on hold. - The floodgates at North Pine Dam have been reopened by Seqwater.

Duration: 0.43
Summary ID: W00041681038

▶ **ABC 612 Brisbane (Brisbane)**
16:00 News - 7/12/2010 4:04 PM
Newsreader
Executive Producer Ms Maree Hawthorne 07 3377 5244

Audience	
Male 16+:	11,000
Female 16+:	8,000
All People:	20,000
Advertising Space Rate	
AUD:	90

The floodgates have been closed at North Pine Dam this afternoon. SEQ Water says they were open yesterday.

Duration: 0.11
Summary ID: W00041681679
This program or part thereof is syndicated to the following 11 station(s):- ABC Capricornia (Rockhampton), ABC Far North (Cairns), ABC Gold and Tweed Coasts (Gold Coast), ABC North Queensland (Townsville), ABC North West Qld (Mt Isa), ABC Southern Queensland (Toowoomba), ABC Sunshine and Cooloola Coasts (Sunshine Coast), ABC Tropical North (Mackay), ABC Western Queensland (Longreach), ABC Wide Bay (Bundaberg), Radio National (Brisbane)

▶ **ABC 612 Brisbane (Brisbane)**
05:30 News - 8/12/2010 5:32 AM
Newsreader
Executive Producer Ms Maree Hawthorne 07 3377 5244

Audience	
Male 16+:	15,000
Female 16+:	14,000
All People:	29,000
Advertising Space Rate	
AUD:	465

Queensland Urban Utilities, which provides water for residents in Brisbane and Ipswich, aims to reduce its operating budget and cut household water bills. Chairwoman Jude Munro says this builds on savings put in place by the Qld Government

Interviewees: Jude Munro, Chairwoman, Queensland Urban Utilities
Duration: 0.39
Summary ID: W00041686815

▶ **ABC Southern Queensland (Toowoomba)**
06:30 News - 8/12/2010 6:31 AM
Newsreader
Journalist-in-Charge Ms Kim Lyell 07 4631 3830

Audience	
Male 16+:	5,900
Female 16+:	7,200
All People:	13,100
Advertising Space Rate	
AUD:	295

Queensland Urban Utilities says eternal cost cutting means customers will save $30 in water bills over the next two years. Jude Munro, Chairperson, Queensland Urban Utilities, says it adds to the Government's $5b reduction.

Interviewees: Jude Munro, Chairperson, Queensland Urban Utilities
Duration: 0.38
Summary ID: W00041688594

FM Radio

▶ ABC Sunshine and Cooloola Coasts (Sunshine Coast)
Mornings - 7/12/2010 8:39 AM
Annie Gaffney
Station Phone 07 5475 5000

Audience	
Male 16+:	3,300
Female 16+:	3,800
All People:	7,100
Advertising Space Rate	
AUD:	1,993

Gaffney speaks with Bob Abbot, Mayor, Sunshine Coast Regional Council about the Qld Government's cost cutting measures that they announced regarding water. Gaffney says that the Tugun desalination plant has been mothballed, two entities merged into one and the ratepayer will benefit by $5. Abbot says that he is not surprised by the changes since there is a lot of waste built into the system. He does not know how long people will be paying off the Traveston Dam. He talks about the GreenLink corridors that have to be reinvestigate around the Palmview structure plan because of orders by the Qld Government. He responds to statements by Murray Lyons from The Sippy Downs and District Community Association claiming that the more detailed study will not consider all of the options or involve the community, saying that they will find viable options and do whatever they can to make them work. He talks about the meeting last night between angry residents and Stirling Hinchliffe, Minister for Infrastructure and Planning, Stockland and the ULDA. Abbot says that it has always been the plan for the development to be approved for environmental protection. He says that it is the same as Mark McArdle has said in regards to Traveston Dam, since it will have an effect on the area. He goes on to talk about how Council has decorated trees in a number of districts with Christmas lights.

Interviewees: Bob Abbot, Mayor, Sunshine Coast Regional Council
Duration: 7.54
Summary ID: W00041675756

▶ **ABC Sunshine and Cooloola Coasts (Sunshine Coast)**
Mornings - 7/12/2010 8:51 AM
Annie Gaffney
Station Phone 07 5475 5000

Audience	
Male 16+:	3,300
Female 16+:	3,800
All People:	7,100
Advertising Space Rate	
AUD:	2,312

Gaffney speaks with Stirling Hinchliffe, Minister for Infrastructure and Planning about a meeting held last night addressing community concerns surrounding Caloundra South. Hinchliffe repeats his vow that there would be no canal estates at the development, and he goes on to talk about the water management designs which will be a central feature of Caloundra South. He says that the ULDA is using innovative water management practices, including storm water systems, and he explains what purple pipe water is. He says that the Sunshine Coast Regional Council will be working with the ULDA closely. Gaffney plays an excerpt from Bill Hoffman, journalist, The Sunshine Coast Daily in which he says that there is a measurable target for affordable housing in the region, saying that the numbers do not add up and people will not be able to afford housing in the development. Hinchliffe says that he does not think that the excerpt accurately represents what was said at the meeting, saying that Stockland said that they were struggling to hit the affordable housing mark with the materials available at the moment. He goes on to say that Paul Eagles, CEO, ULDA will be requiring Stockland to put a greater variety of housing through. Gaffney plays an excerpt from callback caller Peta who says that the average person could not afford the mortgage of housing at Caloundra South. Hinchliffe says that if you look at work the ULDA has done they have put houses on the market for under $200,000. He said he was encouraged by the residents commitment to environmental protection and affordable housing.

Interviewees: Bill Hoffman, journalist, The Sunshine Coast Daily [excerpt]; Peta, Callback caller, ABC [excerpt]; Stirling Hinchliffe, Minister for Infrastructure and Planning
Duration: 9.10
Summary ID: W00041676018

▶ **River FM (Ipswich)**
12:00 News - 7/12/2010 12:01 PM
Newsreader
Station Phone 07 3813 1000

Audience	
Male 16+:	N/A
Female 16+:	N/A
All People:	N/A
Advertising Space Rate	
AUD:	96

Jeff Seeney, Qld Shadow Minister for Mines and Energy, says the Wivenhoe Dam levels are only around 40 percent capacity, not full as the Qld Government has indicated. The Government says filling the Dam above its capacity would risk the flood protection for the entire region.

Interviewees: Jeff Seeney, Queensland Shadow Minister for Mines and Energy
Duration: 0.40
Summary ID: W00041678167

Internet

▶ **Brisbane Times - www.brisbanetimes.com.au**
Water prices are set to fall in Queensland. Brisb...

Water prices are set to fall in Queensland. Brisbane's water retailer has vowed to save customers about $20 on their water bills by slashing $60 million from its operating costs. Queensland Urban Utilities chair Jude Munro, who until recently was...

Date Found: 8/12/2010 7:22 AM
Summary ID: 85457553
To view the web page: click here>>

Audience	
Unique Daily Visitors:	22,250
Av. Story Audience:	207
Advertising Space Rate	
AUD:	107

▶ **Queensland Government - statements.cabinet.qld.gov.au**
Govt followed on water saving initiative

Minister for Natural Resources Stephen Robertson has welcomed an announcement today by Queensland Urban Utilities to follow the Bligh Governments lead in reducing water bill increases next year. On Sunday, the Government announced it had consolidated...

Date Found: 7/12/2010 11:47 PM
Summary ID: 85416757
To view the web page: click here>>

Audience	
Unique Daily Visitors:	0
Av. Story Audience:	0
Advertising Space Rate	
AUD:	1,963

Press

▶ **Hanging out for a water reward**
Albert & Logan News, 08/12/10, Letters, Page 8
By: None

I TOO received another water bill from Allconnex on Friday and see that they have charged us like wounded bulls again.

Article Information	
Item ID:	00085442111
Circulation:	22,280
Number of words:	164
Article type:	News Item
Photo:	No
Advertising Space Rate	
AUD:	799

▶ Water debacle simply money down the drain

Bayside Bulletin, 07/12/10, Editorials, Page 10
By: None

THE rain that keeps drumming down on rooftops across the state is beating out a different tune for the State Government. With dams at capacity and a rising tide of anger at the increasing cost of water, the Government at the weekend announced major reforms to South East Queensland's water supply grid.

Article Information	
Item ID:	00085336760
Circulation:	47,303
Number of words:	318
Article type:	Editorial
Photo:	Yes
Advertising Space Rate	
AUD:	340

▶ Refreshing drop

Courier Mail, 08/12/10, Edition Changes - Late City, Page 24
By: Sarah Vogler

ABOUT 1.3 million southeast Queensland residents will receive a further discount on their water bills after a water body's board voted to find $60 million in savings. Queensland Urban Utilities, which sells water to residents in Brisbane, Ipswich and the Scenic Rim, Lockyer Valley and Somerset regional council areas, has announced it will cut water bills by $10 a year in 2011-12 and by $20 in 2012-13.

Article Information	
Item ID:	00085435163
Circulation:	211,230
Number of words:	282
Article type:	News Item
Photo:	No
Advertising Space Rate	
AUD:	2,028

▶ Wyaralong Dam Open Day makes a splash

Fassifern Guardian, 01/12/10, General News, Page 13
By: None

OVER 2,800 people turned out to the third and final Wyaralong Dam Open Day which featured bus tours of the site and entertainment. Queensland Water Infrastructure Chief Executive Officer Frankie Carroll, described the day as a success.

Article Information	
Item ID:	00084931836
Circulation:	2,912
Number of words:	210
Article type:	News Item
Photo:	Yes
Advertising Space Rate	
AUD:	442

▶ Infrastructure rise causes anger

Gatton Lockyer Brisbane Valley Star, 08/12/10, General News, Page 6
By: None

AUSTRALIA can be a costly place to live in 2010 especially when frustrated ratepayers face ever-increasing costs.

Article Information	
Item ID:	00085436660
Circulation:	19,970
Number of words:	198
Article type:	News Item
Photo:	No
Advertising Space Rate	
AUD:	243

▶ Chat room

Gold Coast Bulletin, 08/12/10, Letters, Page 25
By: DP

SNIPERS in Paradise. Thanks 2 do gooders & gutless politicians there is no respect 4 laws & police/courts no longer hay authority 2 take appropriate action.

Article Information	
Item ID:	00085428418
Circulation:	39,593
Number of words:	1389
Article type:	Letter
Photo:	No
Advertising Space Rate	
AUD:	2,074

▶ WARNING ON WATER

Northside Chronicle, 08/12/10, General News, Page 11
By: None

WATER retailers must declare proposed charges three months in advance following legislation passed in State Parliament. Natural Resources, Mines and Energy Minister Stephen Robertson said the legislation was aimed at making Queensland Urban Utilities, Unitywater and Allconnex Water more transparent.

Article Information	
Item ID:	00085324492
Circulation:	63,294
Number of words:	44
Article type:	News Item
Photo:	No
Advertising Space Rate	
AUD:	76

▶ Professor joins panel on water

South West News, 08/12/10, General News, Page 15
By: None

USQ professor John Cole has been invited by Queensland Urban Utilities to represent community, social and business sectors in company decisions. As director of the Australian Centre for Sustainable Business and Development, Professor Cole is part of the company's new Customer and Community Reference Group.

Article Information	
Item ID:	00085329231
Circulation:	40,570
Number of words:	101
Article type:	News Item
Photo:	No
Advertising Space Rate	
AUD:	215

▶ Ratepayers take fight to parliament

Westerner The, 02/12/10, General News, Page 4
By: Ashleigh Elliott

Local ratepayers fed up with rising water charges have taken their fight one step further, storming Parliament House in Brisbane. Members and supporters of the Ratepayers Action Group Moreton Bay delivered a petition containing the signatures of more than 2000 people from the region, showing the growing discontent with the rising costs of water and sewerage treatment services.

Article Information	
Item ID:	00085056346
Circulation:	17,000
Number of words:	375
Article type:	News Item
Photo:	Yes
Advertising Space Rate	
AUD:	465

08-Dec-2010
Page: 8
Letters
Market: Brisbane
Circulation: 22280
Type: Suburban
Size: 163.83 sq.cms
----F--

Hanging out for a water reward

I TOO received another water bill from Allconnex on Friday and see that they have charged us like wounded bulls again.

All the ratepayers in southeast Queensland bit the bullet when our dams were low.

We let our lawns and plants die.

We installed water tanks and had our shower roses and faucets changed to use less water.

We had shorter showers and let our cars and houses stay dirty as well as many other sacrifices.

Now that the dams are so full they are releasing the excess water into the rivers to be wasted into the ocean, why don't they give us a little reward for the times we went without.

How about giving us one quarter without charging us for water, so we can put it to use instead of it going to waste.

But no, they won't give us a reward, they just charge us more and more each time.

Even a dog gets a free biscuit when it does something right.

Glenn Breedon,
Eagleby

07-Dec-2010
Page: 10
Editorials
Market: Brisbane
Circulation: 47303
Type: Suburban
Size: 126.20 sq.cms
-T-----

Bayside Bulletin
Tuesday, December 7, 2010

Water debacle simply money down the drain

THE rain that keeps drumming down on rooftops across the state is beating out a different tune for the State Government.

With dams at capacity and a rising tide of anger at the increasing cost of water, the Government at the weekend announced major reforms to South East Queensland's water supply grid.

Treasurer Andrew Fraser says these "tough steps" will maximise efficiencies across the entire water grid, saving around $18 million a year – savings that will flow on to the Government's portion of household water bills.

For householders struggling with budgets already under pressure, it's a small concession – very small – in the order of $5 next year, discounted down from an extra $59 to $54.

One of the big ticket items in the Government's $9 billion water security plan – the trouble-plagued desalination plant at Tugun on the Gold Coast – has also been mothballed as part of the weekend's reform.

The $1.126 billion project is now largely a white elephant, returning to full-time operation only if the region's dam capacity drops to 60 per cent. It's just part of around $4 billion spent on water projects that may never benefit the State.

With the announcements of the weekend reforms, the Government has attempted to take a higher moral ground in its war of words with local councils, calling on them to pass on savings to householders. Last week Natural Resources Minister Stephen Robertson accused councils of lying about their responsibility for water pricing.

Redland City Mayor Melva Hobson is calling on the State and local governments to work together for a solution to relieve future price pressures.

Perhaps Brisbane Lord Mayor Campbell Newman has the right suggestion when he says the Government should write off the debt on the tangled mess that is the water grid and pass savings back to consumers.

This latest rejig of water management in South East Queensland indicates that some of the millions spent hastily to address inadequate planning is more money down the drain.

08-Dec-2010
Page: 24
Edition Changes - Late City
Market: Brisbane
Circulation: 211230
Type: Capital City Daily
Size: 124.53 sq.cms
MTWTFS-

Refreshing drop

State water utility cuts bill by $10

Sarah Vogler
COUNCILS REPORTER

ABOUT 1.3 million southeast Queensland residents will receive a further discount on their water bills after a water body's board voted to find $60 million in savings.

Queensland Urban Utilities, which sells water to residents in Brisbane, Ipswich and the Scenic Rim, Lockyer Valley and Somerset regional council areas, has announced it will cut water bills by $10 a year in 2011-12 and by $20 in 2012-13.

It comes after the State Government offered all southeast Queensland residents a $5 discount as part of further reforms to its water grid.

The reforms include putting the Tugun desalination plant on standby mode and merging bulk water authorities Seqwater and WaterSecure.

QUU board chair Jude Munro said the savings would be passed on to consumers as part of a $60 million efficiency-finding campaign agreed on by the board on Monday afternoon.

She said the board also agreed to an independent review of capital projects in 2011-12 to ensure prudent investment and no "gold-plating" of new assets

"We will balance the need to maintain frontline services to customers, while investing in the water and wastewater infrastructure needed to support our rapidly growing region," Ms Munro said.

Natural Resources and Mines Minister Stephen Robertson welcomed the decision yesterday.

He called on the other two water utilities, Unitywater and Allconnex, to do the same.

Lord Mayor Campbell Newman said the QUU's announcement was a good start but did not go far enough to find efficiencies.

"More needs to be done to reduce the cost impost on families and if the state cut their exorbitant bulk water costs and handed back control of water to councils, we could do that," Cr Newman said.

MEDIA MONITORS

back

01-Dec-2010
Page: 13
General News
Market: Boonah QLD
Circulation: 2912
Type: Regional
Size: 271.94 sq.cms
--W----

Wyaralong Dam Open Day makes a splash

OVER 2,800 people turned out to the third and final Wyaralong Dam Open Day which featured bus tours of the site and entertainment.

Queensland Water Infrastructure Chief Executive Officer, Frankie Carroll, described the day as a success.

"We had 2,800 visitors in four hours and people travelled from as far as Lismore, Toowoomba and the Sunshine Coast to see how the Dam is progressing.

"The bus tours around the dam construction site were a huge hit - visitors left the site excited and ready to come back and enjoy the dam once complete.

"Everyone I spoke to had a great day out and were equally impressed by the work completed on the project."

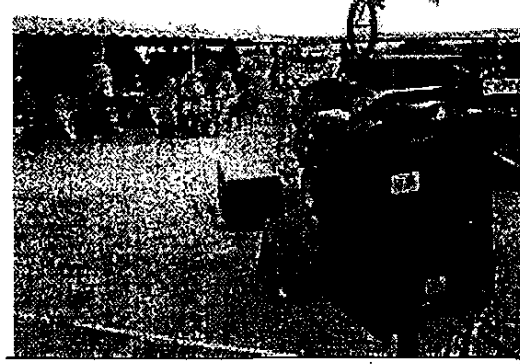
He said the day was also about education.

"This was our third and final public Open Day to keep the community informed on how the Dam project has progressed.

"A decision will be made in 2011 about the official opening of the dam."

Members of Boonah Rotary had their hands full putting on a sausage sizzle for the 2800 people that attended the Open Day.

LEFT: Mountain bike demonstrations fit in well with the numerous tracks and trails that will feature as part of Wyaralong Dam's facilities.



RIGHT: Kids were kept entertained on the day with a range of activities, including having their faces painted.

08-Dec-2010
Page: 6
General News
Market: Gatton QLD
Circulation: 19970
Type: Regional
Size: 104.10 sq.cms
--W----

Infrastructure rise causes anger

AUSTRALIA can be a costly place to live in 2010 especially when frustrated ratepayers face ever-increasing costs.

Lockyer Valley Regional Council (LVRC) said they are facing the brunt of community complaints as skyrocketing rates continue to shock the region.

Mayor Steve Jones said infrastructure charges are being laid down by semi-corporate entities and he has never seen astronomical costs like it.

"We've never had this disgusting amount of charges and the community must stand up," Cr Jones said.

"We need to take a serious look at what's going on."

He said rural areas are losing big time.

"There is one rule for one and one rule for another."

The Queensland Urban Utilities' (QUU) high costs and standards of infrastructure maintenance have cause more headaches within local government and increased dissent within the community.

"We get labelled as the ones who are increasing the charges," Cr Graham Moon said.

"The community must be aware that the council is not to blame."

Cr Jones said the State Government was trying to attract rural landholders into metropolitan developments and certain areas were being privileged over others.

LVRC is launching an official request into prices of available services and a comparison between State Government charges.

08-Dec-2010
Page: 25
Letters
Market: Gold Coast QLD
Circulation: 39593
Type: Regional
Size: 510.88 sq.cms
MTWTF--

Chat room

0416 905 148

SNIPERS in Paradise. Thanks 2 do gooders & gutless politicians there is no respect 4 laws & police/courts no longer hav authority 2 take appropriate action. – DP

FAREWELL Mr. Squiggle and thank you Norman Hetherington. A sad loss of a great talent.

HA if yr goin to kill someone qld is the place. Cops and prosecution are hopeless. Plea bargains like the yank scuba diver wife killer make our judicial system an international joke. What about that bloke called omega who was murdered on a public street oz day 2yrs ago. No idea. Unless the offender is handed to them on a silver platter with full admission no one would be convicted in qld.

IF Julian Assange was a hero he would publish communications between the likes of Taliban and their cronnies. It's our security he's exposing just for his 15 min of fame.

QLD girl. It should be left to each individual home owner whether they want their pool fenced or not. This new law wont stop kids from drowning. To that they need to be taught to swim from an early age.

JAMES, go inspect the fence round the very new Hilton forecourt fountain! I'll fence my already fenced pool when that one is! No fence, no supervision, right on main road middle Surfers. Inspected & approved by the council you work for I'm guessing! Teach your children pool safety & supervise them & stop blaming everyone else for your carelessness people!

GOOD on ya gc bulletin advertising how cheap and easy it is to get weapons on the street. keep fueling the fire!!

4TH generation nuclear power fail-safe, no waste. In my back yard anyday, Virtual free power, U'd be mad not to-bring it on!

AS a long time resident of mudgeeraba village i am concerned about the future of the village if the mosque goes ahead. We will be outsiders in the village. Look what has happened in sydney suburbs. Do we want our village to turn into bankstown or lakemba?

BLIGH can't add up! Turn off desal save 32k per day x 365 days = $11.7m @ $5 per home per year saving that's 2.3million homes! There's only 1.7m homes and overflowing dams! – 1+1=3

GOVT. and police are focusing on revenue rising, that's why guns and crimes run wild. – Max

NO wonder the gold coast is the crime capital of Australia. Bikies and drug dealers do as they please while the government and cops sit on their hands and say there's no problem. What a pathetic joke!

MAKES me spew to see a speed camera near a shopping centre, where there has never been an accident. Then a drive up the M1 to witness high speed idiots. I saw 30 plus incidents of what I would imagine would be high range offences. No police! – Jaxon

JAMES, bet u are rubbing your hands & salivating at all the money u will make inspecting our pools. Mine did comply under old rules, but now Bligh has changed the rules it doesnt – I have 2 self closing doors to pool area, all adults in house, big lake unfenced across road, a spa near river at back of house, have to fence spa, but not river!! Come on, this is ridiculous. U can drain & fill my pool cause I cant afford another fence! Also cant afford over $300 for inspection. Last 1 I had the Council did for free. U & Anna can go jump off something high. – LMR

TO the young gang on push bikes who tried to break into our house last night in tugun, could you please come back and get your push bikes you left behind. Also i have a present here for you. Yours – .308

CAN we reverse the desalination plant and salt up some of this excess water we have and replenish the ocean? Or maybe bottle it and sell to the chinese for their shark fin aquariums? Surely council has a hair brained scheme for it? They have one for everything else! Patrick

OMG! Im a gal with 2 arms and a head! U MUST b talking about me! I guess we have 2 drink coffee now cause that's all the folk on here seem 2 do. Pj

TO the hot guy on white motorbike. Put that toy away and come for a ride with us. 3 mazda girls.

SD, more details about yaself i have no idea who you are! Peace Crema chic

TO the guy who laughed. Wanna be

T bone at Canungra or Brooksy Beenleigh butchery for best hams and smoked chooks. – X Meatworker

JEZ – more children and adults drown in pools than in creeks and lakes. Fence the pools. If you don't

08-Dec-2010
Page: 25
Letters
Market: Gold Coast QLD
Circulation: 39593
Type: Regional
Size: 510.88 sq.cms
MTWTF--

more specific to who it was ;). What kind of maroon car? - interested blonde

TARYN u are my princess love you forever xx

2 the sexy council worker, with the mo in the big yellow truck that drives over D Bar hill every morning. Ur hot. Wanna catch up sometime? Hot surfer girl x

TO the girl in woolies runaway bay on monday night wearing the short like the bars effect get the safety glass, looks better.

WHAT a joke vodafone is! i get disconnected every two minutes and when i actually get thru again the reception is pathetic and i keep dropping out. Anyone, else got the same? – Wog

GUNS arnt the problem – criminals who arnt afraid of the law or punishment are part of the problem, the other part is pollies and the legal system that fails dismally to punish criminals for their crimes. Honest gun owners dont walk the streets shooting at ppl but we are the easiest group to punish cos we cant afford the top lawyers to defend us.

INSTEAD of tightening gun laws, the government should scrap them. Then there would be a balance of power against the crims. Sam mermaid

QLD is in one huge mess – power and water rates going sky high, shutting down Tuguns Desal rustbucket to save residents a lousy $5 a year, Bligh selling off public assests because this hopeless Labor Gov has sent Qld broke, yet useless Anna Bligh is bidding for the Commonwealth games and prepared to spend

green one piece suit, I kicked myself for not asking your name. Couldn't get you out of my head. How about the same time next monday?

TO the guy at sharks gym, boardies @ black singlet mon night. Want to work out with me. Pink top girl

ALEX @ deli, I'm probably a bit old 4 u but u get my fires burning!

B.R. I am the luckiest girl in the world. I Love you X :) me

tens of $millions. The Qld Governor needs to sack this Bligh circus before Qld goes bankrupt. we can't wait til the election to boot them out. – KenW

LEDA Developments might think Cobaki Lakes is a wonderful place to live but they obviously don't care about the aquatic life of the eco system when you look at the photo taken 6/05/2010 on www.nearmap.com

THE Oz nat anthem is a rip-off. Simply google RAOConline and sing along to "The Village Blacksmith" ha ha! – ydog

THE reason i used the catholic church re the simpsons was to shut up the people who claim it rots morality not to defend a church. I believe all religions are a business and should be taxed accordingly. – Corey

IF bill potts knows about illegal firearms on the coast then as a good citizen why doesn't he report it to the police? That's right, he's not a citizen he's a lawyer. – todorossi.

MCPEEVED stop eatin that mccrap then the only hair in ur food will be ur own!

OVER a billion dollars in speed camera fines last year and still the road toll increases! Clearly they dont reduce road deaths, and in some cases they have shown to increase it. Lets get rid of them!

NO pool fence stopped my son when he was young. Not only did we teach him to save himself if he did jump (fell) into a pool we had to Teach him not to climb.

GUNS laws mean nothing. Anyone can get a gun. Just up the price of bullets. No one will want to waste a $10,000 bullet on an inocent bystander. If someones found with a bullet in them they must of done something wrong. If they hold a servo up they're not going to waste a bullet because there wouldn't be $10,000 in the register. – Bullet salesman.

MY bro's a senior cop in nsw and he wont tell me wots goin down so how has da average joe got a chance of really knowin wots happening in his own backyard. This society is made for crime and criminals. Stuff it i'm goin bush. Where everyone knows whos who and whats what.

PEOPLE should really consider using there Blinkers!!!! I see them zipping in and out of traffic. they should really go back to do their driving tests. – over it

ANYONE who bags wikileaks obviously has skeletons in closet ! Jillian assange is doing the average Joe good in letting them know how corrupt some officials are and how big cover ups can be.

STOP blaming gccc for pool fence laws, its state gov & capt bligh new law. Fact.

08-Dec-2010
Page: 11
General News
Market: Brisbane
Circulation: 63294
Type: Suburban
Size: 16.37 sq.cms
--W----

WARNING ON WATER

WATER retailers must declare proposed charges three months in advance following legislation passed in State Parliament. Natural Resources, Mines and Energy Minister Stephen Robertson said the legislation was aimed at making Queensland Urban Utilities, Unitywater and Allconnex Water more transparent.

08-Dec-2010
Page: 15
General News
Market: Brisbane
Circulation: 40570
Type: Suburban
Size: 47.31 sq.cms
--W----

Professor joins panel on water

USQ professor John Cole has been invited by Queensland Urban Utilities to represent community, social and business sectors in company decisions.

As director of the Australian Centre for Sustainable Business and Development, Professor Cole is part of the company's new Customer and Community Reference Group.

Comments from the group will affect a submission to the Queensland Water Commission concerning a proposed new water and wastewater customer code.

"I wanted to be part of the reference panel partly because of the experience I've had in the government and the industry, but also because I'm a citizen, a ratepayer and a stakeholder," Professor Cole said.

Visit www.urbanutilities.com.au.

MEDIA MONITORS

back

02-Dec-2010
Page: 4
General News
Market: Samford QLD
Circulation: 17000
Type: Regional
Size: 268.60 sq.cms
Fortnightly

Ratepayers take fight to parliament

By Ashleigh Elliott

Local ratepayers fed up with rising water charges have taken their fight one step further, storming Parliament House in Brisbane.

Members and supporters of the Ratepayers Action Group Moreton Bay delivered a petition containing the signatures of more than 2000 people from the region, showing the growing discontent with the rising costs of water and sewerage treatment services.

In the past six months the Ratepayers Action Group has been pivotal in arranging meetings for people to voice their concerns about the price hikes.

Within the petition was a request for the State Government that a Royal Commission be appointed to investigate the establishment and running of the South-East Queensland water grid.

It also requests that the Queensland Parliament appoint a water ombudsman to oversee and monitor the supply of water to residents in the south-east.

Amongst the group of ratepayers that took the petition to Parliament in a wheelbarrow was Geoff McKay, Chairman of the Pine Rivers South branch of the action group.

He said the petition was about voicing the concerns of many people in the state who are not happy with the "unjustified" price hikes since July.

Under Unitywater, which provides water and sewerage services in the Moreton Bay and Sunshine Coast regions, the cost of such services have risen by 34 per cent in the Caboolture area and by 27 per cent in the Pine Rivers district.

"It's just another increase to the list of things that are becoming more expensive to live," Mr McKay said.

"The cost of living is increasing so much, and people are just not happy with Unitywater's big bang approach to apparently get Moreton Bay up to speed with what they should be paying for water.

"The mismanagement of water has gone on for years and even now there is more bureaucracy surrounding it.

"People are also concerned that it will have an adverse affect for the general economy as well, because they have less money to spend on other things if their income is all taken up by bills.

"Moreton Bay has suffered some of the highest increases and we want to let Parliament know what we would like to see done."

Ratepayers Action Group members present petitions to State Opposition MPs Jarrod Bleijie and Glen Elmes outside Parliament House in Brisbane.

Barry Dennien

From: Barry Dennien
Sent: Wednesday, 8 December 2010 8:25 AM
To: Dan Spiller
Subject: FW: Actual v's Pre-drought Business As Usual comparison
Attachments: The drought in review.pptx

Dan

One for you Monday, Jamie will not give up on getting that model run done, I think my blue pen line need a check.

From: Jamie Quinn [mailto:jamie@jamiequinn.com.au]
Sent: Tuesday, 7 December 2010 11:47 AM
To: Barry Dennien
Cc: Gary Humphrys; Jamie Quinn; Dan Spiller
Subject: FW: Actual v's Pre-drought Business As Usual comparison

Barry,

In view of the CM's editorial headline today, it may be prudent for modelling to be available to demonstrate the result of the supply and demand management actions taken by Government, ie the differential between what happened and what would have happened if it had been 'business as usual' on the supply and demand sides of the equation.

I assume the Minister's office has already asked the QWC for this.

Regards,

Jamie Quinn
(T) 07 3389 4790; (M) 0437 003556
(Email) jamie@jamiequinn.com.au

From: Dan Spiller [mailto:Daniel.Spiller@seqwgm.com.au]
Sent: Monday, 22 November 2010 3:19 PM
To: Jamie Quinn; Barry Dennien
Cc: Gary Humphrys
Subject: RE: Actual v's Pre-drought Business As Usual comparison

Jamie,

I couldn't find the slide I was thinking of, but the attached goes some way there.

I will get the modellers to make up the slide you were thinking of.

Dan

From: Jamie Quinn [mailto:jamie@jamiequinn.com.au]
Sent: Monday, 22 November 2010 2:06 PM
To: Barry Dennien
Cc: Gary Humphrys; Dan Spiller; Jamie Quinn
Subject: Actual v's Pre-drought Business As Usual comparison

Barry,

During the Board meeting on 18.11.10, we discussed facts to support/demonstrate the effectiveness of the water security strategy in SEQ. As I mentioned, water demand management has been an essential element of the water security equation. Dan mentioned he may have a slide that demonstrates the actual verses pre-drought business as usual dam supply levels.

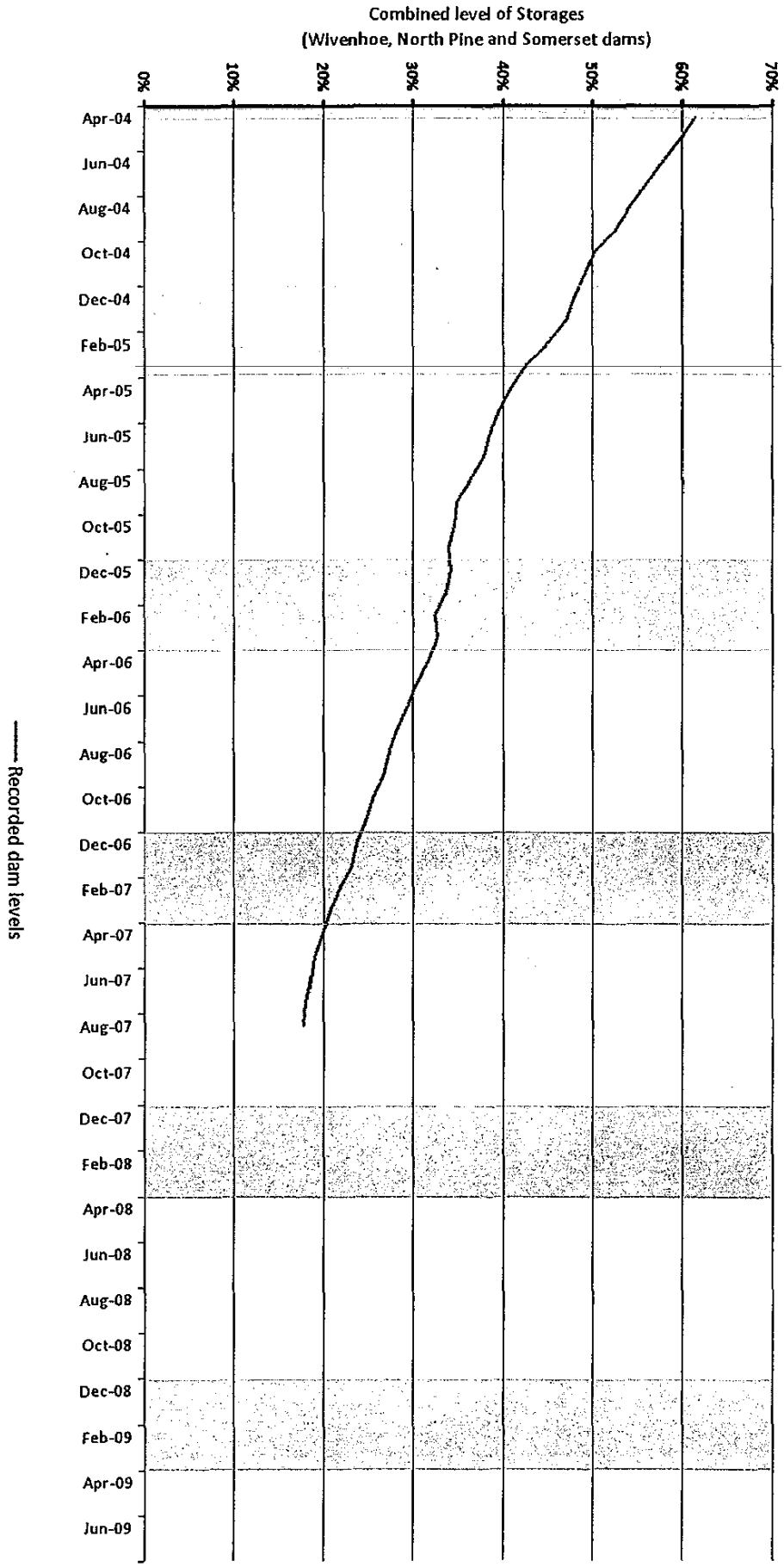
I would be interested to see that slide if it is available. The SEQ Water Grid communications strategy should be endeavouring to convey a comprehensive picture so that short memories are continually jolted with strikes of reality. The reality is that 2 million people could have run out of water if a whole raft of actions had not been taken by the Qld Government in partnership with the SEQ community.

Thanks,

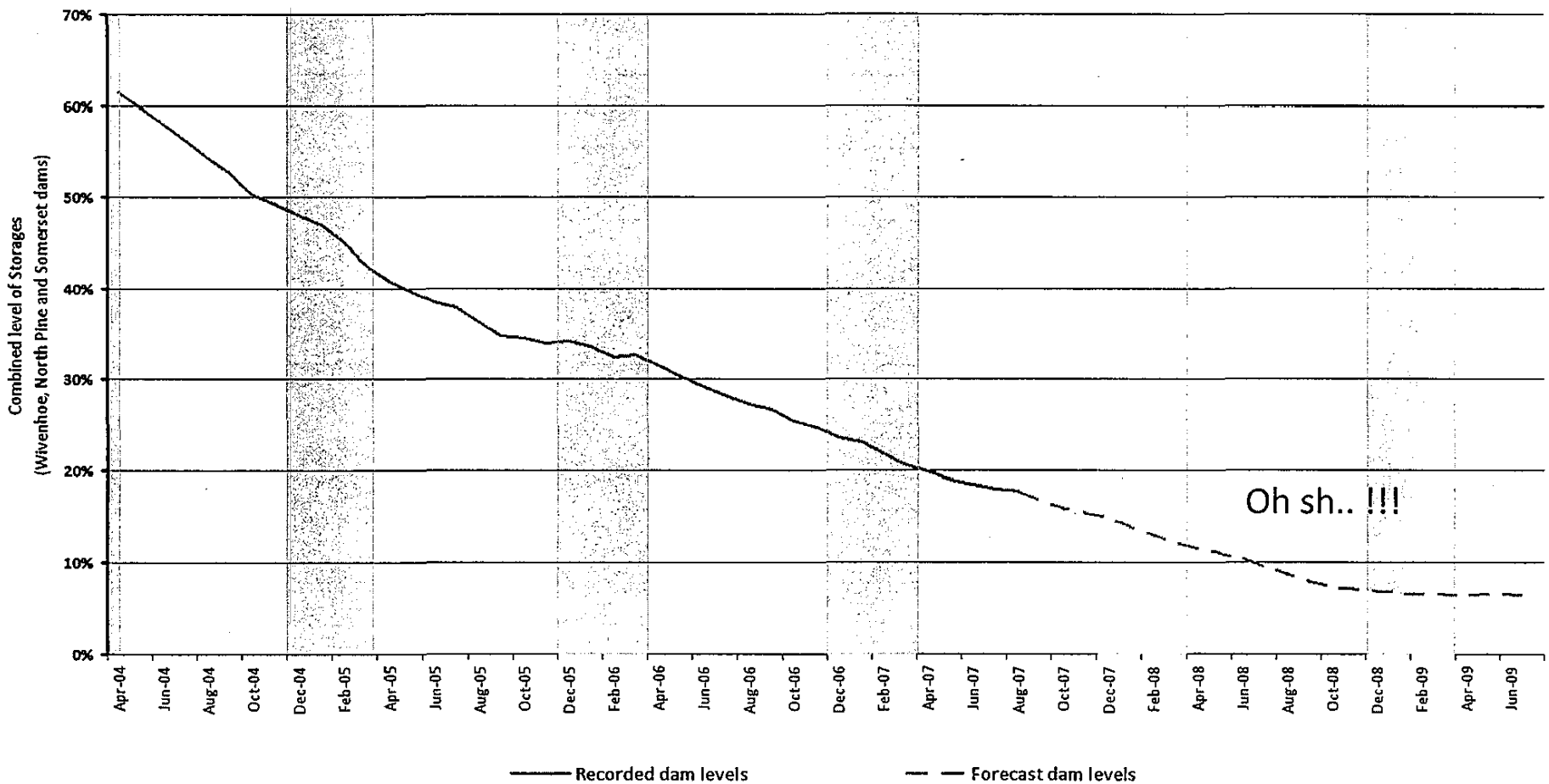
Jamie Quinn
(T) 07 3389 4790; (M) 0437 003556
(Email) jamie@jamiequinn.com.au

Thanksgiving

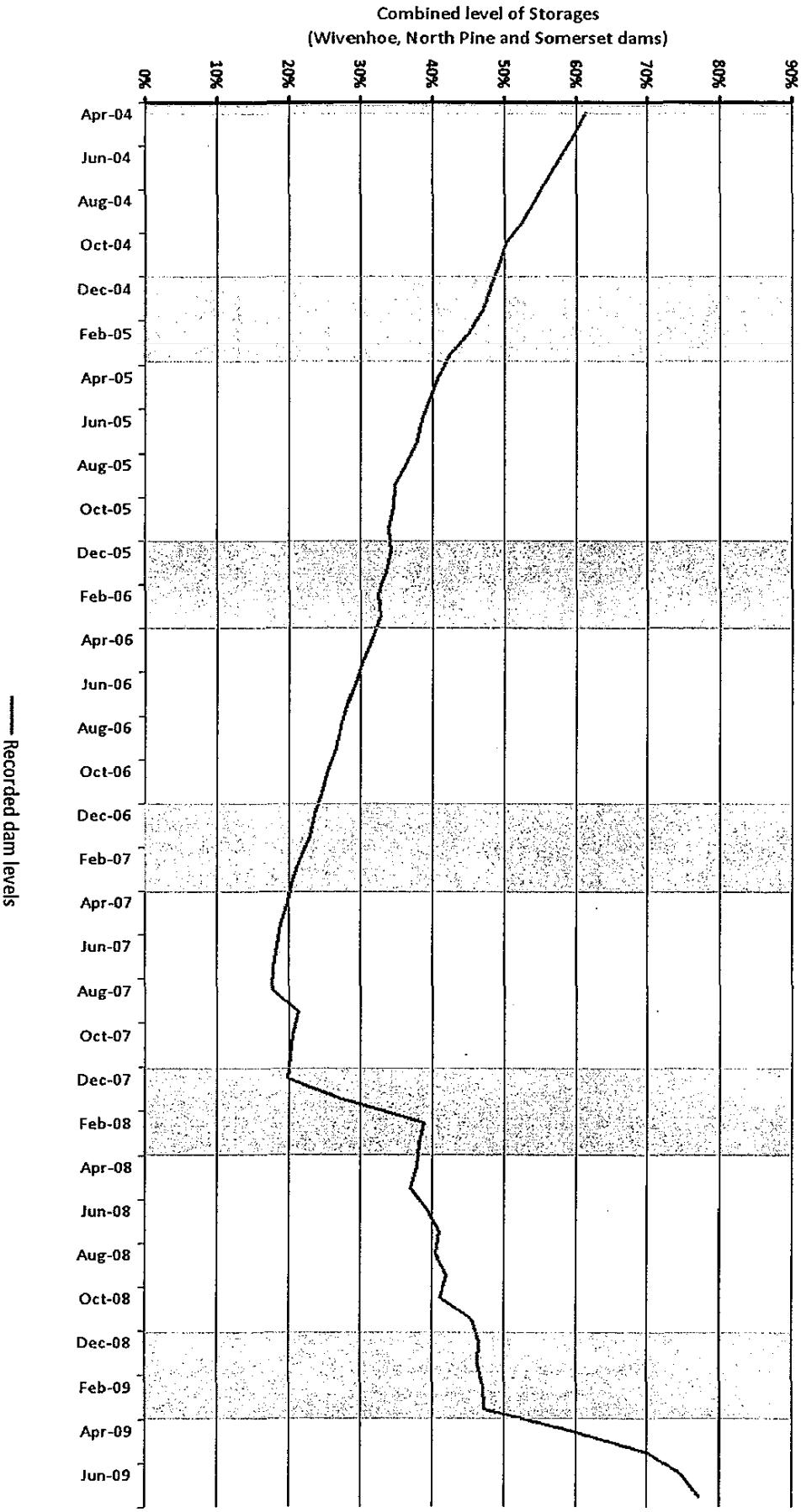
SEQ dam levels



SEQ dam levels



SEQ dam levels



Barry Dennien

From: Michael Lyons
Sent: Thursday, 9 December 2010 11:02 AM
To: Paul Bird
Cc: Dan Spiller; Barry Dennien; Geoff Stead
Subject: RE: Dam Update
Attachments: image001.jpg; image002.jpg

Many thanks Paul.

From: Paul Bird [mailto:pbird@seqwater.com.au]
Sent: Thursday, 9 December 2010 10:07 AM
To: SEQWGM Media
Cc: Michael Lyons; Mike Foster
Subject: Dam Update
Importance: High

NOT FOR PUBLIC RELEASE

If any of the material below is to be used for any form of public communication, please provide us with copy for review prior to any distribution.

Wivenhoe/Somerset

Somerset has received inflows and both Wivenhoe and Somerset are currently above the Full Supply Level and still receiving inflows. We are releasing 6,000ML per day from Somerset into Wivenhoe via cone valve and releasing 4,200ML per day from Wivenhoe through a cone valve and the hydro. 4,200ML is the maximum we can release from Wivenhoe through the valve and hydro without using a gate.

Given current storage levels and wet catchments if the current BOM forecast eventuates we may have to operate the gates. However this will largely depend on where the rain falls across the catchment and the duration of the falls. If gate operations are required it would be a much smaller release in comparison to the earlier event.

North Pine

Gates closed yesterday but with ongoing inflows and showers, there will be a need for a short gate release tonight to discharge inflows received. Releasing overnight will reduce the impact on the community.

Leslie Harrison Dam

Shut down yesterday.

Hinze Dam

Emergency gate releases continuing for several days.

Paul Bird
Senior Communications Advisor
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

P 07 3035 5519 M 0409 111 870 E pbird@seqwater.com.au
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

Gina O'Driscoll

From: Rob Drury [rdrury@seqwater.com.au]
Sent: Thursday, 9 December 2010 12:11 PM
To: Barry Dennien; Jim Pruss
Cc: Dan Spiller; Peter Borrows
Subject: RE:

Barry,

To question 1, no it wasn't modelled mainly because the bigger the event, the much less impact of the reduced FSL. But yes to Question 2 in that this was considered. However the following may help summarise and also offer a way to give the proposal a more detailed analysis in the future.

Basically, there are an unlimited number of scenarios containing an infinite number of rainfall patterns and distributions producing flood events in the Brisbane River for flows both above and below 3500 cumecs. Seqwater has not attempted to model each scenario in the discussion paper or even a variety of scenarios. A major study would be required to undertake this exercise and the study that Seqwater has been commissioned to undertake for the Water Commission relating to raising the Wivenhoe Dam Full Supply Level will consider these issues. This study is scheduled to commence in the new year and take in the order of six months.

The main point to be noted from the discussion paper is that having a relatively small volume of water to fill below the dam FSL provides only limited benefits and the larger the flood, the smaller these benefits will potentially be (although unusual rainfall patterns could produce exceptions). The reason for the reducing potential benefit as flood size increases is due to the reducing proportion of the available volume below FSL to the total flood volume. The other factor is that the available storage volume below FSL is generally only a very small proportion of the total flood storage unless the dam is below around 50% capacity.

Generally although the lower Wivenhoe Dam is at the commencement of the event, the smaller the downstream impacts, as the events get bigger the impact reduction will generally decrease and may be insignificant. And during smaller events, the impact is less significant anyway. Quantifying the exact size of the potential benefit for a range of scenarios will take a major study and as previously discussed, this work will commence in the new year.

Hence to gain any significant benefit, Wivenhoe would have to be considerably lower at the start of an event and assuming the dam would not be kept at 50% or 75% continually, the point to really consider is how does Seqwater lower the storage below FSL before an event. Once rain commences it will generally be too late, as a release strategy may already be optimised to control downstream flood impacts, so increasing releases to lower the storage level will likely worsen those downstream flood impacts. That is, if there are significant flows downstream, it is already too late to pre-release.

The other option is to pre-release based on forecast and before the rain event is underway. However, as seen in recent events, lowering storage levels based on forecast and before the event initiates, is a strategy containing many risks including:

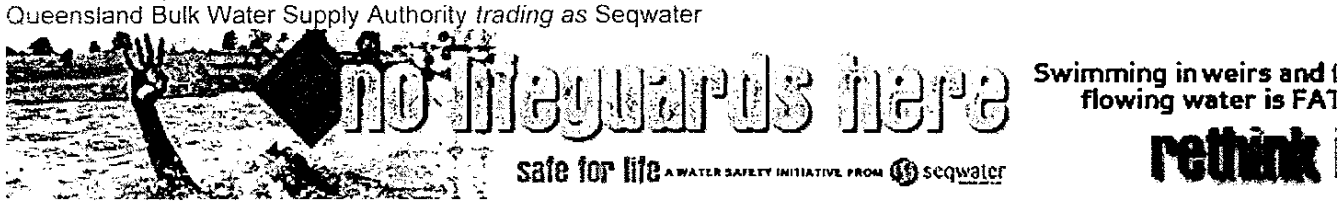
- Causing unnecessary downstream impacts when rainfall below forecast levels is experienced.
- Standing accused of wasting precious water resources when rainfall below forecast levels is experienced.
- Unnecessarily extending bridge inundation times and disrupting irrigation activities downstream of Wivenhoe Dam.
- Unnecessarily increasing river turbidity downstream of Wivenhoe Dam.

In summary, much thought and investigation by many people has gone into developing the current Manual of Flood Mitigation for Wivenhoe and Somerset dams. The Manual should not be modified lightly and certainly not without suitable engineering investigations being undertaken. Seqwater will undertake extensive investigations for the Water Commission in the new year to examine the possibility of raising the full supply level of Wivenhoe Dam. At this stage it is suggested that the scope of this work be widened to consider not just raising the water level in the

dam, but also examining in detail the costs and benefits of modifying the manual of Flood Mitigation to allow "pre-lowering" of storage levels based on forecast rainfall at the onset of potential flood events.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Ph (07) 54278131 | Fax (07) 54261097 | M 0419378740 | E rdrury@seqwater.com.au
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
O Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Barry Dennien [mailto:Barry.Dennien@seqwgm.com.au]
Sent: Wednesday, 8 December 2010 8:23 AM
To: Jim Pruss; Rob Drury
Cc: Dan Spiller; Peter Borrows
Subject:

Hi Jim Rob

The Minister is attending our Board meeting this Monday and given the public debate on Wivenhoe levels is very much front of mind (attached) he will ask on the status of the modelling work. I received your update the other day thankyou, I had a few extra questions, is there any chance on your thoughts before Monday, not necessarily any new model runs before then.

Regards

Barry

Rob

Thanks for the report. Thanks for the additional BOM advice.

I note the good work on modelled sensitivities for flows below 1900m3/sec – W1 strategy (flood manual)

The report then jumps to greater than 3500m3/sec (W4 strategy) and comments how peak water levels would unlikely be impacted and it comments that dam volume reductions of 250,000 megalitres (reduction 20% dam level) would be needed for any significant reduction in water level peaks.

Q1. Was the >3500m3/sec modelled like the October event < 1900M3/sec to draw the above conclusions.

Q2. Was the flow between 1900 and 3500 m3/sec modelled (Strategy W2 W3) with various dam levels to ascertain benefits to peak levels or bridge outage durations

Q3. If no to 1 and 2 is it worth doing considering we make the comments above about maybe a benefit if we have 250,000 ML extra storage.

Regards

Barry

Barry Dennien

From: Barry Dennien
Sent: Thursday, 9 December 2010 12:24 PM
To: Dan Spiller
Subject: Fwd: RE:
Attachments: Seqwater_No-Lifeguards-Here_email_strap; ATT00001.htm; cidimage001.png@01CA24E1.BDB90020; ATT00002.htm

What waff

Regards
Barry Dennien

Begin forwarded message:

From: Rob Drury <rdrury@seqwater.com.au>
Date: 9 December 2010 12:10:59 PM AEST
To: Barry Dennien <Barry.Dennien@seqwgm.com.au>, Jim Pruss <jpruss@seqwater.com.au>
Cc: Dan Spiller <Daniel.Spiller@seqwgm.com.au>, Peter Borrows <pborrows@seqwater.com.au>
Subject: RE:

Barry,

To question 1, no it wasn't modelled mainly because the bigger the event, the much less impact of the reduced FSL. But yes to Question 2 in that this was considered. However the following may help summarise and also offer a way to give the proposal a more detailed analysis in the future.

Basically, there are an unlimited number of scenarios containing an infinite number of rainfall patterns and distributions producing flood events in the Brisbane River for flows both above and below 3500 cumecs. Seqwater has not attempted to model each scenario in the discussion paper or even a variety of scenarios. A major study would be required to undertake this exercise and the study that Seqwater has been commissioned to undertake for the Water Commission relating to raising the Wivenhoe Dam Full Supply Level will consider these issues. This study is scheduled to commence in the new year and take in the order of six months.

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Generally although the lower Wivenhoe Dam is at the commencement of the event, the smaller the downstream impacts, as the events get bigger the impact reduction will generally decrease and may be insignificant. And during smaller events, the impact is less significant anyway. Quantifying the exact size of the potential benefit for a range of scenarios will take a major study and as previously discussed, this work will commence in the new year.

Hence to gain any significant benefit, Wivenhoe would have to be considerably lower at the start of an event and assuming the dam would not be kept at 50% or 75% continually, the point to really consider is how does Seqwater lower the storage below FSL before an event. Once rain commences it will generally be too late, as a release strategy may already be optimised to control downstream flood impacts, so increasing releases to lower the storage level will likely worsen those downstream flood impacts. That is, if there are significant flows downstream, it is already too late to pre-release.

The other option is to pre-release based on forecast and before the rain event is underway. However, as seen in recent events, lowering storage levels based on forecast and before the event initiates, is a strategy containing many risks including:

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Rob

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater

Barry Dennien

From: Mike Foster [mfoster@seqwater.com.au]
Sent: Friday, 10 December 2010 4:52 PM
To: Tim Watts; Geoff Stead
Cc: Michael Lyons; Dan Spiller; Peter Borrows; Barry Dennien; SEQWGM Communications Staff; Paul Bird; Jim Pruss; Bill Andrew; Rob Drury
Subject: Seqwater update
Attachments: image001.png

Tim,

Please find Seqwater update below

North Pine
Closed off early this morning. No lungfish casualties. Council appreciated that we operated over night and closed at 5am to allow crossing to open up, thanks to our staff who came in at 5am.

Wivenhoe/Somerset
Still releasing out of valves at Somerset and Wivenhoe but dams still above FSL.

Rain is predicted Saturday evening/Sunday. Good chance of North Pine operating.
Fair possibility of Wivenhoe releasing but not expected to be a major event based on current predictions. If gates are opened likely to be opened for up to 4-5 days

The Water Grid Manager/Water Grid communications have been advised of the weekend update.

Seqwater has also advised Brisbane City Council, Ipswich Council and Somerset Regional Council and given an undertaking to give them as much notice as possible prior to gate operations.

Mid-Brisbane irrigators have also been advised of the possible gate openings.

Although the Protocols between State and Councils have not been formally signed off, Seqwater will provide WGM with situation reports if gates are mobilised, noting these reports are unlikely to contain Council information.

Cheers Mike.

Mike Foster
Manager Strategic Relations & Communication
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

Ph (07) 30355545 | Fax (07) 3011 5112 | M 0425 250 394 | E mfoster@seqwater.com.au
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Barry Dennien

From: Reilly Bob [Bob.Reilly@derm.qld.gov.au]
Sent: Friday, 10 December 2010 5:54 PM
To: Allen Peter; Barry Dennien; Best Debbie
Cc: rdrury@seqwater.com.au; pborrows@seqwater.com.au; Michael Lyons; michael.shapland@emq.qld.gov.au
Subject: Re: Flood operations at Wivenhoe & North Pine dams

Hi peter

Thanks for the email.

Brisbane city council has committed to the draft protocol, and the other 2 councils are ok with the approach but have some concerns about the wording.

Therefore it is essential that seqwater follows the draft communication protocol--if any issues arise, then please ask them to contact me.

Debbie

I suggest you let the dg know of this possible release.

Thanks

Bob

----- Original Message -----
From: Allen Peter
To: Reilly Bob
Cc: 'Rob Drury' <rdrury@seqwater.com.au>
Sent: Fri Dec 10 17:08:02 2010
Subject: Flood operations at Wivenhoe & North Pine dams

Bob,

Rob Drury has rung me to indicate that there is a significant probability that Wivenhoe will have to operate this weekend. The level is Wivenhoe is EL 67.22 which is already near the first gate opening trigger point of EL 67.25 and there is 50mm of rain forecast for Saturday night/Sunday morning. They have ceased releasing from Somerset to Wivenhoe at the moment to hold the level for the moment. The precise timing of any release will depend on the speed of a front coming across from the west.

Rob has indicated that he will follow the draft communications protocol as closely as possible when operations are needed. He has already spoken to the Councils and is looking to advise the Grid Manager.

North Pine is also probability going to operate if the rain occurs.

Peter Allen
Director Dam Safety (Water Supply)
Office of the Water Supply Regulator
Telephone 07 3224 7636, Mobile 0418 728 755 Facsimile 07 3224 7999 Email peter.allen@derm.qld.gov.au www.derm.qld.gov.au <http://www.nrw.qld.gov.au/> Department of Environment and Resource Management 3rd Floor 41 George Street, Brisbane Q 4000 GPO Box 2454, Brisbane Q 4001

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+--+
Think B4U Print
1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere
3 sheets of A4 paper = 1 litre of water
+--+

Barry Dennien

From: Reilly Bob [Bob.Reilly@derm.qld.gov.au]
Sent: Saturday, 11 December 2010 8:28 AM
To: Barry Dennien
Subject: Fw: Grid Manager Investigation on whether water supply levels can be temporarily reduced during the wet season

Hi barry

Fyi

Regards

Bob

----- Original Message -----
From: Kathy Reilly <threereillys@bigpond.com>
To: Reilly Bob
Sent: Sat Dec 11 08:24:50 2010
Subject: Fw: Grid Manager Investigation on whether water supply levels can be temporarily reduced during the wet season

----- Original Message -----
From: Kathy Reilly <mailto:threereillys@bigpond.com>
To: Best Debbie <mailto:Debbie.Best@derm.qld.gov.au>
Sent: Saturday, December 11, 2010 8:21 AM
Subject: Grid Manager Investigation on whether water supply levels can be temporarily reduced during the wet season

Hi Debbie

The Grid Manager was asked to investigate this issue and report back to the Minister by 30 November 2010. If this has not happened, then the likely floodwater release from Wivenhoe and North Pine dams this weekend will probably result in the DG/Minister's office querying what has happened to it.

In essence, the Gird Manager is looking at whether it is practical/reasonable to temporarily reduce, by a small amount, the water levels in dams such as Wivenhoe during the wet season (without affecting water yield) so as to avoid having to make small flood water releases (such as is likely to occur this weekend) on a number of occasions during the wet season. Several SEQ Councils (including Brisbane City Council) are aware that this matter is being considered, but not the timings--still they could raise the matter as this was the way in which the Leslie Harrsion dam was managed when the councils owned it. Also this will be the second flood water relase this week from North Pine dam--so Moreton Council may raise the matter as well.

For some reason, I finished up being the GM that was briefing on this issue, but it was going up to the DG/Minister through your position rather than Terry Wall. It is not primarily a dam safety/flood mitigation regulatory issue, although changes would neeed to be made to the flood mitigation regulatory arrangements for Somerset/Wivenhoe/North Pine if the policy changes proceeded. The Emergency Action Plans (a dam safety requirement) for several other dams e.g. Leslie Harrison would also require updating.

Regards

Bob

+--+
Think B4U Print
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3 sheets of A4 paper = 1 litre of water
+--+

Barry Dennien

From: Dan Spiller
Sent: Sunday, 12 December 2010 4:31 PM
To: John Bradley (john.bradley@derm.qld.gov.au)
Cc: Peter Borrows; Barry Dennien; bob.reilly@derm.qld.gov.au
Subject: Wivenhoe Dam release
Attachments: Technical Stuation Report W1.docx

John,

Technical report attached for your notification, as flagged this morning. Notification to you is required under the draft protocol.

Details of the proposed release are outlined in the report, as drafted by the Seqwater team.

Note that this event is expected to be smaller than the October event. Seqwater is expecting release 70,000 to 80,000 ML at this time, compared to 650,000 ML released during the October event. More importantly, the flow rate will be only 20 per cent of the October event.

Seqwater has advised the downstream councils and BOM, as outlined in the report and as per the draft protocol. Councils and BOM have not provided written assessments at this stage. Seqwater will continue to consult with them.

We are preparing a media release for this afternoon, flagging the gate release and providing an overview of levels across Water Grid storages. We intend to keep it low key, reflecting that this is a smaller release than October (no TV interviews today). We are consulting with Lance on content. Let me know if you want an opportunity to comment.

Please call me if you require any further information.

Regards,
Daniel Spiller

TECHNICAL SITUATION REPORT

TSR Number	W1	Date of TSR release	12.12.2010	Time of TSR release	2pm

Seqwater status of inflows and dam operations

Somerset/Wivenhoe Dams

Operational releases have been made from Wivenhoe and Somerset Dams over the last week discharging water that has come into the dams, however this is not sufficient to handle the current inflows. Rainfall in the last 24 hours will result in significant inflows to Somerset and Wivenhoe Dams which will require gate operations in the next few days.

At Somerset, two regulators have been opened around midday Sunday and remain open until at least Thursday. This will release approximately 45,000ML into Wivenhoe Dam. Water level in Somerset Dam is expected to peak around 99.7m AHD during Monday.

There is a peak flow of about 150m3/s expected in the mid Brisbane during Monday, mostly resulting from Lockyer Ck. This will be similar to, if not slightly higher than, the peak of 130 m3/s which occurred on Monday 6/12/2010.

Some 30,000 ML is expected to flow into Wivenhoe Dam from the upper Brisbane R during the next week. Coupled with the Somerset release, this will result in a rise at Wivenhoe during the next 24 to 48 hours with a peak water level around 67.6 m AHD. Releases from Wivenhoe will not be made until the runoff from the Lockyer and local areas has passed Savages Crossing so as not to exacerbate local flooding.

Releases from Wivenhoe are expected to commence on Monday afternoon depending on flows downstream and further possible rainfall, ramping up from the current release of 50m3/s to 300m3/s. The regulator will be closed and Gate 3 will be progressively opened to 3.0m. It is expected to remain at this level until Thursday when it will be reduced back to 50m3/s, at which stage the water level in the dam is expected to be below 67.25m AHD. Low level releases of 50m3/s through the hydro and regulator will then continue

It should be noted that a release of 300m3/s will impact upon Twin Bridges, Savages Crossing and Colleges Crossing. The release strategy is to discharge the stored floodwaters as quickly as possible to return the flood buffer in the dams in case there is further rainfall but in a manner that attempts to minimize disruption downstream.

The Dam Regulator has been advised of the planned actions to confirm the suitability of the planned release strategy.

Councils were contacted by phone and a follow up email sent however their phone advice is considered sufficient considering the minor actions required of councils. They can offer further comments if they desire at any stage.

The planned release strategy has been provided around 10am on 12.12.2010 by phone to
Bribsane City Council – Chris Lavin
Ipswich City Council – Tony Trace
Somerset Regional Council – Tony Jacobs

Although informal operational advice to Councils occurs at other times.

Issues raised by Councils were only a request to be advised when releases began to enable bridge closures. Somerset requested Burton's Bridge to remain open if possible or notice provided if we intend to release sufficient water to close it on purpose.

Actions taken will be to mobilise the flood centre on Monday and advise Councils as requested regarding releases.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
0410378740	0419378740

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM was advised of planned releases via their flood information email. No formal advice is required of them as the release is a minor drawdown however there is ongoing advice provided by them on predicted rainfall and flows.

Actions taken will be to mobilise the flood centre on Monday and advise Councils as requested regarding releases and keep BoM up to date.

BoM Technical Officer name	
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

BCC will advise internally for information purposes mainly re bridge closures in other council areas that may affect Brisbane residents.

Actions taken will be to mobilise the flood centre on Monday and advise Councils as requested regarding releases.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	0414 501 398

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Ipswich will coordinate closure of Colleges Crossing as necessary and any other actions.

Actions taken will be to mobilise the flood centre on Monday and advise Councils as requested regarding releases

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	0417 620 225

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Somerset Council will coordinate closure of Twin Bridges and Savages Crossing as necessary and any other actions.

Actions taken will be to mobilise the flood centre on Monday and advise Councils as requested regarding releases

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	0409 627 313

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	13.12.2010	Time		or Event	

Barry Dennien

From: Dan Spiller
Sent: Sunday, 12 December 2010 6:12 PM
To: Gary Humphrys; Jamie Quinn; Gordon Jardine; Dr David Cunliffe; Teresa Dyson
Cc: Barry Dennien; Michael Lyons
Subject: Wivenhoe Dam release
Attachments: Technical Stuation Report W1.docx

Board,

For information, one of the Wivenhoe Dam gates will be opened tomorrow. The below media release provides an overview.

Should you be interested, more detailed information is contained in the attached technical report. This technical report is part of the draft protocol that has been developed with Councils and BOM.

We are seeking to keep our media communications low key, reflecting that this is a much smaller event than October.

I am happy to provide more detail at the meeting.

Regards,
Dan

MEDIA RELEASE
12 DECEMBER 2010

HEAVY RAINS PROMPT CONTROLLED RELEASES FROM WIVENHOE DAM

Controlled releases from Wivenhoe Dam are expected to begin tomorrow afternoon, following the weekend's heavy rainfall across South East Queensland.

Water Grid spokesperson Dan Spiller said the dam operators are likely to open one of the five gates, to release a daily average of 30,000 megalitres over a number of days. The releases will restore the dam to just below full supply level.

"The volume of water released will be less than in October, when we had all five gates open and were releasing up to 130,000 megalitres per day," said Mr Spiller.

"Releases are expected to continue until towards the end of the week, depending upon any further rainfall."

Somerset Dam began releasing water into Wivenhoe Dam at midday today, after heavy rainfall on the Sunshine Coast.

All dams throughout South East Queensland have been hovering around 100 per cent capacity since heavy rainfall during early October.

Hinze Dam is continuing to release approximately 5,000 megalitres of water per day through the outlet gates. Several other local dams are continuing to spill.

Mr Spiller said with all the water currently around the area, the community needs to be vigilant about safety around dams, weirs and fast-flowing waters.

"Members of the public need to be aware of the dangers of swimming in weirs and flooded waterways. The facts are that it only takes ankle deep water to knock you off your feet, and only 60 seconds to drown," he said.

"We are discouraging people from visiting Wivenhoe Dam over the next few days to view the gate openings, given how wet the area is and the forecast for further rainfall."

The Water Grid has consulted with Ipswich, Somerset and Brisbane City Councils regarding the decision to release water from Wivenhoe Dam tomorrow.

All release are being managed in accordance with approved flood management plans. Levels in the Lockyer River were taken into account, with the releases from Wivenhoe Dam timed to allow sufficient time for levels downstream to drop.

The release is expected to result in the closure of Twin Bridges, Colleges Crossing and Savages Crossing.

TECHNICAL SITUATION REPORT

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The Dam Regulator has been advised of the planned actions to confirm the suitability of the planned release strategy.

Councils were contacted by phone and a follow up email sent however their phone advice is considered sufficient considering the minor actions required of councils. They can offer further comments if they desire at any stage.

The planned release strategy has been provided around 10am on 12.12.2010 by phone to
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Somerset Regional Council – Tony Jacobs

Although informal operational advice to Councils occurs at other times.

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Actions taken will be to mobilise the flood centre on Monday and advise Councils as requested regarding releases.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
0410378740	0419378740

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BoM Technical Officer contact details	flood.qld@bom.gov.au

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BCC will advise internally for information purposes mainly re bridge closures in other council areas that may affect Brisbane residents.

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BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	0414 501 398

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Ipswich will coordinate closure of Colleges Crossing as necessary and any other actions.

Actions taken will be to mobilise the flood centre on Monday and advise Councils as requested regarding releases

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	0417 620 225

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Somerset Council will coordinate closure of Twin Bridges and Savages Crossing as necessary and any other actions.

Actions taken will be to mobilise the flood centre on Monday and advise Councils as requested regarding releases

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SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	0409 627 313

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	13.12.2010	Time		or Event	

Barry Dennien

From: SEQWGM Media
Sent: Monday, 13 December 2010 7:20 AM
To: SEQWGM All Staff
Subject: Media release: HEAVY RAINS PROMPT CONTROLLED RELEASES FROM WIVENHOE DAM
Attachments: image001.gif

Hi team

Please note the media release below that was issued last night, regarding Wivenhoe Dam releasing water from later today. A full media summary from over the weekend will follow shortly.

Cheers
Aleisha

From: SEQWGM Media
Sent: Sunday, 12 December 2010 5:58 PM
Subject: Media release: HEAVY RAINS PROMPT CONTROLLED RELEASES FROM WIVENHOE DAM

MEDIA RELEASE
12 DECEMBER 2010

HEAVY RAINS PROMPT CONTROLLED RELEASES FROM WIVENHOE DAM

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Water Grid spokesperson Dan Spiller said the dam operators are likely to open one of the five gates, to release a daily average of 30,000 megalitres over a number of days. The releases will restore the dam to just below full supply level.

"The volume of water released will be less than in October, when we had all five gates open and were releasing up to 130,000 megalitres per day," said Mr Spiller.

"Releases are expected to continue until towards the end of the week, depending upon any further rainfall."

Somerset Dam began releasing water into Wivenhoe Dam at midday today, after heavy rainfall on the Sunshine Coast.

All dams throughout South East Queensland have been hovering around 100 per cent capacity since heavy rainfall during early October.

Hinze Dam is continuing to release approximately 5,000 megalitres of water per day through the outlet gates. Several other local dams are continuing to spill.

Mr Spiller said with all the water currently around the area, the community needs to be vigilant about safety around dams, weirs and fast-flowing waters.

"Members of the public need to be aware of the dangers of swimming in weirs and flooded waterways. The facts are that it only takes ankle deep water to knock you off your feet, and only 60 seconds to drown," he said.

"We are discouraging people from visiting Wivenhoe Dam over the next few days to view the gate openings, given how wet the area is and the forecast for further rainfall."

The Water Grid has consulted with Ipswich, Somerset and Brisbane City Councils regarding the decision to release water from Wivenhoe Dam tomorrow.

All release are being managed in accordance with approved flood management plans. Levels in the Lockyer River were taken into account, with the releases from Wivenhoe Dam timed to allow sufficient time for levels downstream to drop.

The release is expected to result in the closure of Twin Bridges, Colleges Crossing and Savages Crossing.

ENDS

Notes to the editor

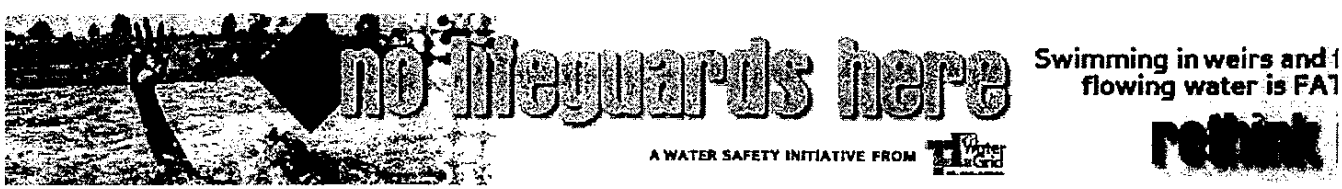
About the SEQ Water Grid

Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information visit www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:
Ph: (07) 3247 3000 | Email: media@seqwgm.com.au



Barry Dennien

From: Aleisha Coote
Sent: Monday, 13 December 2010 7:29 AM
To: Dan Spiller
Cc: Michael Lyons; Barry Dennien
Subject: Interview with Triple M / B105

Importance: High

Morning Dan

Triple M/B105 are interested in doing some grabs this morning regarding the release of water from Wivenhoe later today.

As discussed yesterday, key talking points include:

1. Following the weekend's heavy rainfall we will be operating one of the gates at Wivenhoe Dam later today.

2. The volume of water we will be releasing will be considerably *less* than what was released last month.

3. From this afternoon we will be releasing a daily average of 30,000 megalitres through one of the five gates. The gate will remain open until towards the end of the week, to restore the dam to just below full supply level.

4. In early October we had all gates open for the first time since 1999, releasing up to 130,000 megalitres per day.

5. With increased water around the region we are urging the community to take care and be vigilant about safety around dams, weirs and fast-flowing waters.

6. Members of the public need to be aware of the dangers of swimming in weirs and flooded waterways. The facts are that it only takes ankle deep water to knock you off your feet, and only 60 seconds to drown.

7. We are discouraging people from visiting Wivenhoe Dam over the next few days to view the gate openings, given how wet the area is and the forecast for further rainfall.

We also have the points at the bottom of the media release below regarding consultation with councils and consideration of the Lockyer that we can include if prompted to do so.

I will call to discuss further.

Cheers

Aleisha

MEDIA RELEASE
12 DECEMBER 2010

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Water Grid spokesperson Dan Spiller said the dam operators are likely to open one of the five gates, to release a daily average of 30,000 megalitres over a number of days. The releases will restore the dam to just below full supply level.

"The volume of water released will be less than in October, when we had all five gates open and were releasing up to 130,000 megalitres per day," said Mr Spiller.

"Releases are expected to continue until towards the end of the week, depending upon any further rainfall."

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Mr Spiller said with all the water currently around the area, the community needs to be vigilant about safety around dams, weirs and fast-flowing waters.

"Members of the public need to be aware of the dangers of swimming in weirs and flooded waterways. The facts are that it only takes ankle deep water to knock you off your feet, and only 60 seconds to drown," he said.

"We are discouraging people from visiting Wivenhoe Dam over the next few days to view the gate openings, given how wet the area is and the forecast for further rainfall."

The Water Grid has consulted with Ipswich, Somerset and Brisbane City Councils regarding the decision to release water from Wivenhoe Dam tomorrow.

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For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Barry Dennien

From: Aleisha Coote
Sent: Monday, 13 December 2010 7:40 AM
To: Dan Spiller; Michael Lyons; Barry Dennien
Cc: SEQWGM Communications Staff; Mike Foster; Paul Bird; Scott Denner; Lee Hutchison
Subject: Brisbane Times article
Attachments: image001.jpg; image002.gif

Hi team

Yesterday provided a great opportunity to test the protocols for flood releases from Wivenhoe.

Note the Brisbane Times article below, a very balanced piece that demonstrates our efforts in consulting with councils in the release of water from Wivenhoe today. Thanks everyone for your efforts over the weekend.

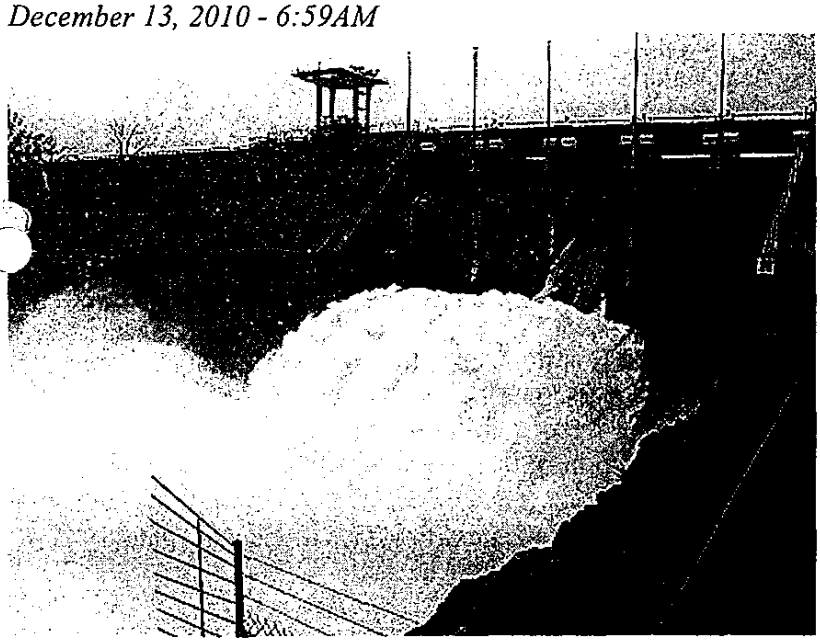
Cheers

Aleisha

As the heavens open, so do the floodgates

Tony Moore

December 13, 2010 - 6:59AM



Wivenhoe Dam last spilled over in October. *Photo: brisbanetimes.com.au reader B. Hughes*

The floodgates at Wivenhoe Dam will be opened for the second time in six weeks this afternoon as water authorities delicately balance Brisbane's creek safety with flood storage.

The new authority that manages southeast Queensland's dams, the Water Grid Manager, confirmed it hoped to release 30,000 megalitres a day through one gate over the next week.

"Releases are expected to continue until towards the end of the week, depending upon any further rainfall," spokesman Dan Spiller said.

The release of water will restore the dam to just below its full supply level.

About 130,000 megalitres of water was released into the upper reaches of the Brisbane River in October.

The release prompted the cancellation of Brisbane ferries and CityCat services for several days as the floodwaters sent logs and other debris through the river system.

It also prompted Brisbane City Council to issue flood alerts for local creeks and streams.

Brisbane Lord Mayor Campbell Newman last week said he retained the right to inform residents if council officers believed there could be flood impacts.

"[The] council will put out warnings when we believe there is an issue that needs to be put out in front of the community," Cr Newman said last Wednesday.

"We will continue to warn people about things and we will be very precise in our language.

"I am going to err on the side always of telling people what is going on, what the experts are saying and I will let people make a decision with the information in hand."

Brisbane, Ipswich and Somerset councils have been consulted on the decision to open the Wivenhoe Dam floodgates.

Colleges Crossing and Twin Bridges crossing near Karana Downs, and Savages Crossing west of Brookfield, are likely to be closed tomorrow afternoon, Mr Spiller said.

Somerset Dam (104.5 per cent capacity) began releasing water into Wivenhoe Dam (102.3 per cent) yesterday, after heavy rainfall on the Sunshine Coast.

Hinze Dam (100 per cent capacity) is already releasing 5000 megalitres of water through its floodgates.

The release of water from Wivenhoe Dam in October - the first time since the eight-year drought began - drew huge crowds of onlookers and led to massive traffic jams.

Mr Spiller asked the public to think twice about travelling to the site.

"We are discouraging people from visiting Wivenhoe Dam over the next few days to view the gate openings, given how wet the area is and the forecast for further rainfall," he said.

Aleisha Coote
Senior Media Advisor
SEQ Water Grid Communications Unit
Phone: (07) 3224 7212 | Fax: (07) 3405 0373
Email: aleisha.coote@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane

Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Barry Dennien

From: Elaina Smouha
Sent: Monday, 13 December 2010 8:01 AM
To: Barry Dennien; Dan Spiller; Grant Horton; Joanne Collins; Peter Wyllie
Subject: Fwd: Media release: HEAVY RAINS PROMPT CONTROLLED RELEASES FROM WIVENHOE DAM

Hi

Will need to notify toowoomba as per the changes to their grid contract.

Pete/Joanne - under the grid contract changes we have agreed to waive the variable charge for water supplied to toowoomba while the wivenhoe gates are opened. This waiver only applies up to march 2011.

I will shoot an email to toowoomba re this.

Elaina Smouha
Director, Governance and Regulatory Compliance
SEQ Water Grid Manager
Phone: (07) 3247 4484 | Mobile: 0459 802 675 | Fax: (07) 3405 0373
Email: elaina.smouha@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Begin forwarded message:

> **From:** SEQWGM Media <media@seqwgm.com.au>
> **Date:** 13 December 2010 7:19:40 AM GMT+10:00
> **To:** SEQWGM All Staff <SEQWGMAllStaff@seqwgm.com.au>
> **Subject: Media release: HEAVY RAINS PROMPT CONTROLLED RELEASES FROM WIVENHOE DAM**
>
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From: SEQWGM Media
Sent: Sunday, 12 December 2010 5:58 PM
Subject: Media release: HEAVY RAINS PROMPT CONTROLLED RELEASES FROM WIVENHOE DAM

MEDIA RELEASE

12 DECEMBER 2010

HEAVY RAINS PROMPT CONTROLLED RELEASES FROM WIVENHOE DAM

Controlled releases from Wivenhoe Dam are expected to begin tomorrow afternoon, following the weekend's heavy rainfall across South East Queensland.

Water Grid spokesperson Dan Spiller said the dam operators are likely to open one of the five gates, to release a daily average of 30,000 megalitres over a number of days. The releases will restore the dam to just below full supply level.

"The volume of water released will be less than in October, when we had all five gates open and were releasing up to 130,000 megalitres per day," said Mr Spiller.

"Releases are expected to continue until towards the end of the week, depending upon any further rainfall."

Somerset Dam began releasing water into Wivenhoe Dam at midday today, after heavy rainfall on the Sunshine Coast.

All dams throughout South East Queensland have been hovering around 100 per cent capacity since heavy rainfall during early October.

Hinze Dam is continuing to release approximately 5,000 megalitres of water per day through the outlet gates. Several other local dams are continuing to spill.

Mr Spiller said with all the water currently around the area, the community needs to be vigilant about safety around dams, weirs and fast-flowing waters.

"Members of the public need to be aware of the dangers of swimming in weirs and flooded waterways. The facts are that it only takes ankle deep water to knock you off your feet, and only 60 seconds to drown," he said.

"We are discouraging people from visiting Wivenhoe Dam over the next few days to view the gate openings, given how wet the area is and the forecast for further rainfall."

The Water Grid has consulted with Ipswich, Somerset and Brisbane City Councils regarding the decision to release water from Wivenhoe Dam tomorrow.

All release are being managed in accordance with approved flood management plans. Levels in the Lockyer River were taken into account, with the releases from Wivenhoe Dam timed to allow sufficient time for levels downstream to drop.

The release is expected to result in the closure of Twin Bridges, Colleges Crossing and Savages Crossing.

ENDS

Notes to the editor

About the SEQ Water Grid

Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information visit www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Barry Dennien

From: SEQWGM Media
Sent: Monday, 13 December 2010 8:34 AM
Subject: Media Report SEQ Water Grid - 13 December 2010
Attachments: image001.gif; Media release_Be DAM smart and safe this summer_11.pdf; Media release_Heavy rain prompts controlled releases from Wivenhoe Dam _12.pdf; SEQ Water Grid Media Report - 13 December 2010.pdf

Hi team

Please see attached today's media report. We launched the 'Be DAM Smart' campaign on Saturday morning out at Somerset Dam (media release attached). Also, after heavy rains over the weekend we will be releasing water from Wivenhoe Dam later today (media release attached).

Coverage over the weekend included the following:

State Government

- The Sunday Mail reports the Bligh Government was recently told to bring forward huge water bill increases of about $150 next financial year to slash the debt for building the water grid by more than $100 million. A leaked Queensland Water Commission review for State Cabinet reveals residents in the Sunshine Coast and Redland City council areas could avoid massive bill hikes forecast for 2017-18 (Sunday Mail)
- The Qld State Government says that three former Mary Valley landowners have bought back properties that were sold to make way for the scrapped Traveston Crossing Dam (ABC Sunshine Coast)

SEQ Water Grid

- Letter to the editor detailing that we could have got by during the drought without costly infrastructure (Toowoomba Chronicle)

Dams

- Media release/coverage: Heavy rains prompt controlled releases from Wivenhoe Dam (coverage received with 4GR, Courier Mail, Toowoomba Chronicle, Triple M, B105, ABC Brisbane, Brisbane Times http://www.brisbanetimes.com.au/queensland/as-the-heavens-open-so-do-the-floodgates-20101213-18ubt.html)
- Media release/coverage: Be DAM smart and safe this summer (coverage received with ABC, 4KQ, Weather Channel, Toowoomba Chronicle, Sunshine Coast Daily, ABC1 News, Channel 9, Channel 7)

Desalination

- Twenty-four workers are left to babysit the troubled Tugun desalination plant which is about to go into standby mode (Sunday Mail)

Restrictions / Consumption

- Water restrictions in Toowoomba will be eased tomorrow to their lowest in 7 years (WIN Toowoomba, 4GR)
- Letter to the editor regarding water restrictions in Toowoomba (Toowoomba Chronicle)
- Gary Hardgrave (4BC) questions why high level water restrictions are still in place in southeast Qld (4BC)
- Water consumption on the Sunshine Coast remains below the 200 litre per person per day voluntary target. According to Queensland Water Commission figures released recently, the Coast's average daily residential water consumption was 186 litres per person per day (Kawana Weekly, Nambour Weekly)

SEQ Retailer-Distributers

- Residents are warned not to fall for a scam in which people claiming to be Moreton Bay Regional Council employees demand instant payment of water bills. Three reports of the phone calls have been received (Northern Times)

- Unitywater's meter-reading program for the January 2011 account is 75 per cent complete. The council-owned water retailer says more than 88,000 Moreton Bay Regional Council-area properties had received a water meter reading notice (Northern Times)

Aleisha Coote
Senior Media Advisor
SEQ Water Grid Communications Unit

SEQ Water Grid

Media Release

MEDIA RELEASE
11 DECEMBER 2010

Be DAM smart and safe this summer

Key safety representatives today pleaded with members of the community to be DAM smart not DAM stupid this summer.

The Water Grid, Queensland Police Service and Maritime Safety Queensland have joined forces to launch a campaign encouraging the public to be 'DAM smart' on and around South East Queensland dams over summer.

Water Grid spokesperson Dan Spiller said Seqwater Rangers, Queensland Maritime Safety officers and Queensland Police will be conducting patrols around our major dams to enforce safe and responsible behaviour on and off the water.

These patrols will involve random breath-testing of boat operators and drivers, as well as monitoring dangerous or anti-social behaviour.

"With the current combined capacity of our three major dams at around 100 per cent, record numbers of more than 150,000 people are expected to visit Water Grid recreation areas over the Christmas and New Year period," said Mr Spiller.

The campaign's slogan "Don't be DAM stupid", is designed to educate people to 'rethink' their behaviour both on and around our dams.

"The majority of our visitors are very well behaved and make the most of our facilities, however even small amounts of dangerous and anti-social behaviour affect everyone," said Mr Spiller.

Ipswich District Queensland Police Inspector, Kevin Keillor said police would be targeting anti-social behaviour across all the recreational areas, including drink driving both on land and water.

"This is not about stopping people enjoying themselves and having fun, it is about ensuring people act responsibly and consider the safety and comfort of others," Inspector Keillor said.

Maritime Safety Queensland General Manager Patrick Quirk said the most common safety mistake boaties make on inland waterways relates to lifejackets.

"They don't carry enough life jackets or don't have the right size or type of

lifejackets for children. All children under 12 must wear a life jacket," Mr Quirk said.

"If you are waterskiing make sure the skier is wearing the right lifejacket and that someone more than 12 years of age is watching at all times."

Heavy rain events during the holiday season could also result in the dams and recreational areas being closed in the interests of community safety.

For information about Seqwater dams and recreation areas or to help plan your trip visit: www.seqwater.com.au

ENDS

Notes to the editor

As part of the campaign, Seqwater Rangers, Maritime Safety and Queensland Police will be monitoring:

- Excessive alcohol consumption
- Boaties & jet skiers keeping their distance from swimmers and paddlers – 30 metres for boats and 60 metres for jet skies
- People speeding in designated six-knot zones
- People swimming in non-designated areas
- Boating or fishing after dusk
- Use of PFDs
- Boat registrations

Seqwater, the Water Grid's bulk water supplier, is responsible for 24 dams and 49 weirs across South East Queensland. We would like to remind visitors:

- Individual permits are required for boating at Somerset and Wivenhoe
- Fishing permits are required for most dams where fishing is permitted (Further information on individual sites can be found on www.seqwater.com.au)
- Camping is only permitted in designated camp sites. Rangers will be on the lookout for illegal campers on private property
- While some public cooking facilities are available, visitors are advised to bring their own gas bottles and cooking equipment. The lighting of open fires is prohibited.
- Be courteous to other people whether it be on boat ramps, campsites and on the road.
- Don't litter.
- Supervise children at all times.

Background

- Many of our dams allow a range of recreational activities including camping, fishing and swimming.
- Boat permits for Somerset and Wivenhoe can be purchased at a cost of $15 for a Weekly $100 for an annual permit or renewal $75 at the following places:
- Wivenhoe Information Centre
- Fernvale Futures Information Centre, Fernvale
- Somerset General Store, Somerset
- Catchment Cafe, Somerset
- Lake Somerset Holiday Park, Somerset
- Grand Hotel, Esk
- Or directly from Rangers on weekends and holidays
- Boat permits are not required for Atkinson, Maroon, Borumba or Moogerah Dams where fuel-powered boats and skiing are also permitted.

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Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Barry Dennien

From: Scott Denner
Sent: Monday, 13 December 2010 8:40 AM
To: Barry Dennien; Dan Spiller; Michael Lyons; Lee Hutchison
Subject: FW: Technical Report W1
Attachments: Technical Stuation Report W1.docx; image001.jpg; image002.png

Gents

I think the TSR that was raised meets the intent of the protocol. In the event that a future assessment indicated localised or greater flooding in any of the urban conurbations, I would expect the council reps to provide greater guidance in their section.

Lee is chasing down the mobile number of the DG of DCS (lee – we already have that of the DERM DG), and also ascertaining off both agencies whether they have some form of Duty System in the event that their DG is not directly contactable. These contact details will be inserted in our 'contacts' emails, including on OCA, as well as handwritten on the copy of the draft protocol that is kept in the Duty Managers folder.

Regards

Scott

Scott Denner
Director Risk and Technology
SEQ Water Grid Manager
Ph: 0061 (07) 3404 0798 | Fax: 0061 (07) 3405 0373
Email: scott.denner@seqwgm.com.au
Post: PO Box 16205, BRISBANE CITY EAST, QLD 4002
Visit: Level 15, 53 Albert St, BRISBANE
ABN: 14783 317 630

From: Dan Spiller
Sent: Sunday, 12 December 2010 3:52 PM
To: Michael Lyons; Scott Denner; Aleisha Coote
Cc: Dan Spiller
Subject: FW: Technical Report W1

Hopefully with the attachment this time.

From: Rob Drury [rdrury@seqwater.com.au]
Sent: Sunday, 12 December 2010 2:46 PM
To: Dan Spiller
Cc: Mike Foster; Jim Pruss; Peter Borrows; David Roberts
Subject: Technical Report W1

Dan,
Attached is the Technical Report for our release from Wivenhoe planned to start tomorrow.

The WGM, Councils and Dam Regulator have all been informed but this will meet our obligations under the Protocol as it stands, the Protocol will no doubt be adjusted after Council comments but this meets the technical requirements.

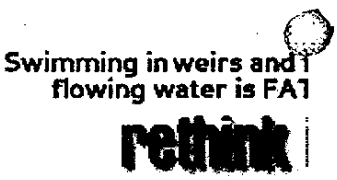
It is really an update report and will send another one when we start releasing and then when we make any major change, probably shutdown as the releases will be fairly constant. Communications will still occur regardless.

Councils are aware of the plans and I have sent them an email asking if they want to submit any assessment however considering the low level impact of the release apart from bridge closures, they probably won't. No assessment from the BoM as it is not impacting on flood levels however they have been given the information.

The Protocol mentions sending the Report as per the ERP which may mean going to the emergency email address but as we discussed last week, I will send to you as it does not require emergency actions and is more of a heads up. However let me know if you want it sent there in the future or elsewhere, I think that was in the Protocol to ensure it was not lost and we had a process during emergencies.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

Ph (07) 54278131 | Fax (07) 54261097 | M 0419378740 | E rdrury@seqwater.com.au
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

TECHNICAL SITUATION REPORT

TSR Number	W1	Date of TSR release	12.12.2010	Time of TSR release	2pm

Seqwater status of inflows and dam operations

Somerset/Wivenhoe Dams

Operational releases have been made from Wivenhoe and Somerset Dams over the last week discharging water that has come into the dams, however this is not sufficient to handle the current inflows. Rainfall in the last 24 hours will result in significant inflows to Somerset and Wivenhoe Dams which will require gate operations in the next few days.

At Somerset, two regulators have been opened around midday Sunday and remain open until at least Thursday. This will release approximately 45,000ML into Wivenhoe Dam. Water level in Somerset Dam is expected to peak around 99.7m AHD during Monday.

There is a peak flow of about 150m3/s expected in the mid Brisbane during Monday, mostly resulting from Lockyer Ck. This will be similar to, if not slightly higher than, the peak of 130 m3/s which occurred on Monday 6/12/2010.

Some 30,000 ML is expected to flow into Wivenhoe Dam from the upper Brisbane R during the next week. Coupled with the Somerset release, this will result in a rise at Wivenhoe during the next 24 to 48 hours with a peak water level around 67.6 m AHD. Releases from Wivenhoe will not be made until the runoff from the Lockyer and local areas has passed Savages Crossing so as not to exacerbate local flooding.

Releases from Wivenhoe are expected to commence on Monday afternoon depending on flows downstream and further possible rainfall, ramping up from the current release of 50m3/s to 300m3/s. The regulator will be closed and Gate 3 will be progressively opened to 3.0m. It is expected to remain at this level until Thursday when it will be reduced back to 50m3/s, at which stage the water level in the dam is expected to be below 67.25m AHD. Low level releases of 50m3/s through the hydro and regulator will then continue

It should be noted that a release of 300m3/s will impact upon Twin Bridges, Savages Crossing and Colleges Crossing. The release strategy is to discharge the stored floodwaters as quickly as possible to return the flood buffer in the dams in case there is further rainfall but in a manner that attempts to minimize disruption downstream.

The Dam Regulator has been advised of the planned actions to confirm the suitability of the planned release strategy.

Councils were contacted by phone and a follow up email sent however their phone advice is considered sufficient considering the minor actions required of councils. They can offer further comments if they desire at any stage.

The planned release strategy has been provided around 10am on 12.12.2010 by phone to
Bribsane City Council – Chris Lavin
Ipswich City Council – Tony Trace
Somerset Regional Council – Tony Jacobs

Although informal operational advice to Councils occurs at other times.

Issues raised by Councils were only a request to be advised when releases began to enable bridge closures. Somerset requested Burton's Bridge to remain open if possible or notice provided if we intend to release sufficient water to close it on purpose.

Actions taken will be to mobilise the flood centre on Monday and advise Councils as requested regarding releases.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
0410378740	0419378740

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM was advised of planned releases via their flood information email. No formal advice is required of them as the release is a minor drawdown however there is ongoing advice provided by them on predicted rainfall and flows.

Actions taken will be to mobilise the flood centre on Monday and advise Councils as requested regarding releases and keep BoM up to date.

BoM Technical Officer name	
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

BCC will advise internally for information purposes mainly re bridge closures in other council areas that may affect Brisbane residents.

Actions taken will be to mobilise the flood centre on Monday and advise Councils as requested regarding releases.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	0414 501 398

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Ipswich will coordinate closure of Colleges Crossing as necessary and any other actions.

Actions taken will be to mobilise the flood centre on Monday and advise Councils as requested regarding releases

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	0417 620 225

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Somerset Council will coordinate closure of Twin Bridges and Savages Crossing as necessary and any other actions.

Actions taken will be to mobilise the flood centre on Monday and advise Councils as requested regarding releases

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	0409 627 313

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	13.12.2010	Time		or Event

Barry Dennien

From: Michael Lyons
Sent: Monday, 13 December 2010 8:43 AM
To: Reilly Bob; Allen Peter; Barry Dennien; Best Debbie
Cc: rdrury@seqwater.com.au; pborrows@seqwater.com.au; michael.shapland@emq.qld.gov.au; Mike Foster; John Adcock
Subject: RE: Flood operations at Wivenhoe & North Pine dams

Good morning Bob,

FYI - we followed the draft protocol yesterday on advice that Wivenhoe would spill today. It was a good exercise which certainly worked from a comms perspective. The respective comms managers including myself had met on several occasions to nut out harmonisation. We actually provided a heads-up to the group on Friday that a spill might occur on the weekend. I understand that the protocol also proved well from an ops point of view yesterday. For noting: Somerset Council does not have the capacity to field calls from rate payers in relation to local flooding levels. This is especially the case on weekends. Tony Jacobs says that once advised they erect standard signage warning of increased levels at certain points and that's that. The Brisbane times also published a positive story today re the cooperation.

Regards

Mike

Michael Lyons
Director
SEQ Water Grid Communications Unit
SEQ Water Grid Manager
Phone: (07) 3247 3014 | Fax: (07) 3405 0373
Email: michael.lyons@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
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MEDIA RELEASE
12 DECEMBER 2010

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Mr Spiller said with all the water currently around the area, the community needs to be vigilant about safety around dams, weirs and fast-flowing waters.

"Members of the public need to be aware of the dangers of swimming in weirs and flooded waterways. The facts are that it only takes ankle deep water to knock you off your feet, and only 60 seconds to drown," he said.

"We are discouraging people from visiting Wivenhoe Dam over the next few days to view the gate openings, given how wet the area is and the forecast for further rainfall."

The Water Grid has consulted with Ipswich, Somerset and Brisbane City Councils regarding the decision to release water from Wivenhoe Dam tomorrow.

All release are being managed in accordance with approved flood management plans. Levels in the Lockyer River were taken into account, with the releases from Wivenhoe Dam timed to allow sufficient time for levels downstream to drop.

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From: Reilly Bob [mailto:Bob.Reilly@derm.qld.gov.au]
Sent: Friday, 10 December 2010 5:54 PM
To: Allen Peter; Barry Dennien; Best Debbie
Cc: rdrury@seqwater.com.au; pborrows@seqwater.com.au; Michael Lyons; michael.shapland@emq.qld.gov.au
Subject: Re: Flood operations at Wivenhoe & North Pine dams

Hi peter

Thanks for the email.

Brisbane city council has committed to the draft protocol, and the other 2 councils are ok with the approach but have some concerns about the wording.

Therefore it is essential that seqwater follows the draft communication protocol--if any issues arise, then please ask them to contact me.

Debbie

I suggest you let the dg know of this possible release.

Thanks

Bob

----- Original Message -----
From: Allen Peter
To: Reilly Bob
Cc: 'Rob Drury' <rdrury@seqwater.com.au>
Sent: Fri Dec 10 17:08:02 2010
Subject: Flood operations at Wivenhoe & North Pine dams

Bob,

Rob Drury has rung me to indicate that there is a significant probability that Wivenhoe will have to operate this weekend. The level is Wivenhoe is EL 67.22 which is already near the first gate opening trigger point of EL 67.25 and there is 50mm of rain forecast for Saturday night/Sunday morning. They have ceased releasing from Somerset to Wivenhoe at the moment to hold the level for the moment. The precise timing of any release will depend on the speed of a front coming across from the west.

Rob has indicated that he will follow the draft communications protocol as closely as possible when operations are needed. He has already spoken to the Councils and is looking to advise the Grid Manager.

North Pine is also probability going to operate if the rain occurs.

Peter Allen
Director Dam Safety (Water Supply)
Office of the Water Supply Regulator
Telephone 07 3224 7636, Mobile 0418 728 755 Facsimile 07 3224 7999
Email peter.allen@derm.qld.gov.au
www.derm.qld.gov.au <http://www.nrw.qld.gov.au/>
Department of Environment and Resource Management
3rd Floor 41 George Street, Brisbane Q 4000
GPO Box 2454, Brisbane Q 4001

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Subject: RE: Flood operations at Wivenhoe & North Pine dams

Hi Mike

Thanks

One issue that we will need to clarify is whether the use of the two regulators to release floodwater at Somerset Dam (which is covered by the Protocol, as well as Wivenhoe)is a trigger event for the protocol.
While I appreciate that their use has not raised any flooding issues, we still need to be clear about this point.

Regards

Bob

Bob Reilly
General Manager, Office of the Water Supply Regulator
Telephone: 07 3224 2898 Mobile: 0408 985 852 Facsimile: 07 3224 7999
Email: bob.reilly@derm.qld.gov.au
www.derm.qld.gov.au

Department of Environment and Resource Management Lvl 3 41 George Street, Brisbane Q 4000
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Peter Allen
Director Dam Safety (Water Supply)
Office of the Water Supply Regulator
Telephone 07 3224 7636, Mobile 0418 728 755 Facsimile 07 3224 7999 Email peter.allen@derm.qld.gov.au www.derm.qld.gov.au <http://www.nrw.qld.gov.au/> Department of Environment and Resource Management 3rd Floor 41 George Street, Brisbane Q 4000 GPO Box 2454, Brisbane Q 4001

+--+
Think B4U Print
1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere
3 sheets of A4 paper = 1 litre of water
+--+

Barry Dennien

From: Barry Dennien
Sent: Monday, 13 December 2010 9:25 AM
To: Elaina Smouha; Dan Spiller; Grant Horton; Joanne Collins; Peter Wyllie
Subject: RE: Media release: HEAVY RAINS PROMPT CONTROLLED RELEASES FROM WIVENHOE DAM

ta

From: Elaina Smouha
Sent: Monday, 13 December 2010 8:01 AM
To: Barry Dennien; Dan Spiller; Grant Horton; Joanne Collins; Peter Wyllie
Subject: Fwd: Media release: HEAVY RAINS PROMPT CONTROLLED RELEASES FROM WIVENHOE DAM

Hi

Will need to notify toowoomba as per the changes to their grid contract.

te/Joanne - under the grid contract changes we have agreed to waive the variable charge for water supplied to toowoomba while the wivenhoe gates are opened. This waiver only applies up to march 2011.

I will shoot an email to toowoomba re this.

Elaina Smouha
Director, Governance and Regulatory Compliance
SEQ Water Grid Manager
Phone: (07) 3247 4484 | Mobile: 0459 802 675 | Fax: (07) 3405 0373
Email: elaina.smouha@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Begin forwarded message:

> **From:** SEQWGM Media <media@seqwgm.com.au>
> **Date:** 13 December 2010 7:19:40 AM GMT+10:00
> **To:** SEQWGM All Staff <SEQWGMAllStaff@seqwgm.com.au>
> **Subject: Media release: HEAVY RAINS PROMPT CONTROLLED RELEASES FROM WIVENHOE DAM**
>
> Hi team
>
> Please note the media release below that was issued last night, regarding Wivenhoe Dam releasing water from later today. A full media summary from over the weekend will follow shortly.
>
> Cheers

Aleisha

From: SEQWGM Media
Sent: Sunday, 12 December 2010 5:58 PM
Subject: Media release: HEAVY RAINS PROMPT CONTROLLED RELEASES FROM WIVENHOE DAM

MEDIA RELEASE

12 DECEMBER 2010

HEAVY RAINS PROMPT CONTROLLED RELEASES FROM WIVENHOE DAM

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Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Barry Dennien

From: SEQWGM Media
Sent: Monday, 13 December 2010 11:20 AM
Subject: Media alert: GATES SET TO OPEN AT WIVENHOE AT 1.00PM
Attachments: image001.gif

Media alert

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Where: Wivenhoe Dam

When: 1.00pm, Monday 13 December

Photo opportunities: the best photos can be captured from the public viewing platform. This can be accessed by turning left off the Brisbane Valley Highway, near Fernvale.

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Barry Dennien

From: Michael Lyons
Sent: Monday, 13 December 2010 11:26 AM
To: Barry Dennien; Dan Spiller; michael.shapland@dcs.qld.gov.au; sdcc@dcs.qld.gov.au
Cc: Reilly Bob
Subject: FLOOD GATE SET TO OPEN AT WIVENHOE AT 1.00PM
Attachments: image001.gif

Please be advised that Wivenhoe will open a single flood release gate at 1pm today. In line with the draft protocol the Ipswich, Somerset and Brisbane City Councils have been consulted.

Regards

Michael Lyons
Director
SEQ Water Grid Communications Unit
SEQ Water Grid Manager
Phone: (07) 3247 3014 | Fax: (07) 3405 0373
Email: michael.lyons@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002

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Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Barry Dennien

From: Aleisha Coote
Sent: Monday, 13 December 2010 11:43 AM
To: Barry Dennien
Subject: FW: Media alert: GATES SET TO OPEN AT WIVENHOE AT 1.00PM
Attachments: image001.gif

Importance: High

Hi Barry – Please see the alert and Media Release below, which details the amount of water Seqwater will release each day as 30,000 megalitres.

I Seqwater are sending through the rate this amount equates to shortly.

Thanks!
Jade

Aleisha Coote
Senior Media Advisor
SEQ Water Grid Communications Unit
Phone: (07) 3224 7212 | Fax: (07) 3405 0373
Email: aleisha.coote@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

From: SEQWGM Media
Sent: Monday, 13 December 2010 11:23 AM
Subject: Media alert: GATES SET TO OPEN AT WIVENHOE AT 1.00PM
Importance: High

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Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Barry Dennien

From: Barry Dennien
Sent: Monday, 13 December 2010 11:49 AM
To: Bradley John; ken.smith@premiers.qld.gov.au
Cc: Dan Spiller; 'Rob Drury'; Michael Lyons
Subject: FW: Media alert: GATES SET TO OPEN AT WIVENHOE AT 1.00PM
Attachments: image001.gif

Ken / John

In accordance with the new flood release protocols I am required to inform you when a release is to be made from Wivenhoe Dam.

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Regards

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Barry Dennien

From: Ken Smith [Ken.Smith@premiers.qld.gov.au]
Sent: Monday, 13 December 2010 11:55 AM
To: Barry Dennien; John Bradley (JOhn.Bradley@derm.qld.gov.au)
Subject: FW: Media alert: GATES SET TO OPEN AT WIVENHOE AT 1.00PM
Attachments: image001.gif

Thanks Barry. No issues with Council ?

Regards

Ken Smith
Director-General
Department of the Premier and Cabinet

Phone: 07 322 44728 Fax: 3229 2049
Mobile: 0417 730 013
Email: Ken.Smith@premiers.qld.gov.au

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represent the views of the State of Queensland. This email is confidential and may be subject to a claim of legal privilege.

If you have received this email in error, please notify the author and delete this message immediately.

Barry Dennien

From: Barry Dennien
Sent: Monday, 13 December 2010 12:10 PM
To: 'Ken Smith'; John Bradley (JOhn.Bradley@derm.qld.gov.au)
Subject: RE: Media alert: GATES SET TO OPEN AT WIVENHOE AT 1.00PM
Attachments: image001.gif

Ken

No issues raised, the release is minor and will have very little impact if any on BCC, Ipswich and Somerset will have a few bridge closures and feel the impact a little more.

Barry

From: Ken Smith [mailto:Ken.Smith@premiers.qld.gov.au]
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h: (07) 3247 3000 | Email: media@seqwgm.com.au

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represent the views of the State of Queensland. This email is confidential and may be subject to a claim of legal privilege.

If you have received this email in error, please notify the author and delete this message immediately.

Barry Dennien

From: Ken Smith [Ken.Smith@premiers.qld.gov.au]
Sent: Monday, 13 December 2010 12:25 PM
To: Barry Dennien
Subject: RE: Media alert: GATES SET TO OPEN AT WIVENHOE AT 1.00PM
Attachments: image001.gif

Thanks Barry. Understand that far more than a quarter below release levels following October rainfall.

Regards

Ken Smith
Director-General
Department of the Premier and Cabinet

Phone: 07 322 44728 Fax: 3229 2049
Mobile: 0417 730 013
Email: Ken.Smith@premiers.qld.gov.au

Tomorrow's Queensland: strong, green, smart, healthy and fair - www.towardQ2.qld.gov.au

Please consider the environment before printing this email (3 sheets of paper = 1 litre of water)

From: Barry Dennien [mailto:Barry.Dennien@seqwgm.com.au]
Sent: Monday, 13 December 2010 12:10 PM
To: Ken Smith; John Bradley (JOhn.Bradley@derm.qld.gov.au)
Subject: RE: Media alert: GATES SET TO OPEN AT WIVENHOE AT 1.00PM

Ken

No issues raised, the release is minor and will have very little impact if any on BCC, Ipswich and Somerset will have a few bridge closures and feel the impact a little more.

Barry

From: Ken Smith [mailto:Ken.Smith@premiers.qld.gov.au]
Sent: Monday, 13 December 2010 11:55 AM
To: Barry Dennien; John Bradley (JOhn.Bradley@derm.qld.gov.au)
Subject: FW: Media alert: GATES SET TO OPEN AT WIVENHOE AT 1.00PM

Thanks Barry. No issues with Council ?

Regards

Ken Smith
Director-General
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Phone: 07 322 44728 Fax: 3229 2049
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From: Barry Dennien [mailto:Barry.Dennien@seqwgm.com.au]
Sent: Monday, 13 December 2010 11:49 AM
To: Bradley John; Ken Smith
Cc: Dan Spiller; Rob Drury; Michael Lyons
Subject: FW: Media alert: GATES SET TO OPEN AT WIVENHOE AT 1.00PM

Ken / John

In accordance with the new flood release protocols I am required to inform you when a release is to be made from Wivenhoe Dam.

All parties to the protocol have been consulted and they raised no concerns with the release strategy.

Note the media release below.

Regards

Barry Dennien

From: SEQWGM Media
Sent: Monday, 13 December 2010 11:20 AM
Subject: Media alert: GATES SET TO OPEN AT WIVENHOE AT 1.00PM

Media alert

Following last night's announcement, one of the five gates at Wivenhoe Dam will be opening today at 1.00pm.

Where: Wivenhoe Dam

When: 1.00pm, Monday 13 December

Photo opportunities: the best photos can be captured from the public viewing platform. This can be accessed by turning left off the Brisbane Valley Highway, near Fernvale.

For further information, please note the media release below.

From: SEQWGM Media
Sent: Sunday, 12 December 2010 5:58 PM
Subject: Media release: HEAVY RAINS PROMPT CONTROLLED RELEASES FROM WIVENHOE DAM

MEDIA RELEASE
12 DECEMBER 2010

HEAVY RAINS PROMPT CONTROLLED RELEASES FROM WIVENHOE DAM

Controlled releases from Wivenhoe Dam are expected to begin tomorrow afternoon, following the weekend's heavy rainfall across South East Queensland.

Water Grid spokesperson Dan Spiller said the dam operators are likely to open one of the five gates, to release a daily average of 30,000 megalitres over a number of days. The releases will restore the dam to just below full supply level.

"The volume of water released will be less than in October, when we had all five gates open and were releasing up to 130,000 megalitres per day," said Mr Spiller.

"Releases are expected to continue until towards the end of the week, depending upon any further rainfall."

Somerset Dam began releasing water into Wivenhoe Dam at midday today, after heavy rainfall on the Sunshine Coast.

All dams throughout South East Queensland have been hovering around 100 per cent capacity since heavy rainfall during early October.

Cinze Dam is continuing to release approximately 5,000 megalitres of water per day through the outlet gates. Several other local dams are continuing to spill.

Mr Spiller said with all the water currently around the area, the community needs to be vigilant about safety around dams, weirs and fast-flowing waters.

"Members of the public need to be aware of the dangers of swimming in weirs and flooded waterways. The facts are that it only takes ankle deep water to knock you off your feet, and only 60 seconds to drown," he said.

"We are discouraging people from visiting Wivenhoe Dam over the next few days to view the gate openings, given how wet the area is and the forecast for further rainfall."

The Water Grid has consulted with Ipswich, Somerset and Brisbane City Councils regarding the decision to release water from Wivenhoe Dam tomorrow.

All release are being managed in accordance with approved flood management plans. Levels in the Lockyer River were taken into account, with the releases from Wivenhoe Dam timed to allow sufficient time for levels downstream to drop.

The release is expected to result in the closure of Twin Bridges, Colleges Crossing and Savages Crossing.

ENDS

Notes to the editor

About the SEQ Water Grid

Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

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For further information visit www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:
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Barry Dennien

From: Jade Simmons
Sent: Monday, 13 December 2010 1:01 PM
To: Barry Dennien
Subject: HI Barry - Hot Issues Brief ready for the Minister.

Hi Barry,

The Hot Issues Brief on Wivenhoe and other dam releases is ready for you and the Minister.

Jade Simmons
Senior Correspondence Officer
SEQ Water Grid Communications Unit
SEQ Water Grid Manager
Phone: (07) 3247 4462 | Fax: (07) 3405 0373
Email: jade.simmons@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002

Barry Dennien

From: SEQWGM Media
Sent: Monday, 13 December 2010 1:46 PM
To: news@river949.com
Subject: Interview River 949 FM - Wivenhoe releases
Attachments: Media release_Be DAM smart and safe this summer_11.pdf; Media release_Heavy rain prompts controlled releases from Wivenhoe Dam _12.pdf

Hi Matt

Thanks for your phone call.

Just to confirm we will have Dan Spiller contact you on 3813 1021 to provide some grabs at around 3.00pm regarding the opening of Wivenhoe. I've also attached our media release on the dam safety campaign that was launched over the weekend – with all the water around at the moment the messages in this release are incredibly timely.

Chat soon
Aleisha

Aleisha Coote
Senior Media Advisor
SEQ Water Grid Communications Unit
Phone: (07) 3224 7212 | Fax: (07) 3405 0373
Email: aleisha.coote@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

SEQ Water Grid

Media Release

MEDIA RELEASE
12 DECEMBER 2010

HEAVY RAINS PROMPT CONTROLLED RELEASES FROM WIVENHOE DAM

Controlled releases from Wivenhoe Dam are expected to begin tomorrow afternoon, following the weekend's heavy rainfall across South East Queensland.

Water Grid spokesperson Dan Spiller said the dam operators are likely to open one of the five gates, to release a daily average of 30,000 megalitres over a number of days. The releases will restore the dam to just below full supply level.

"The volume of water released will be less than in October, when we had all five gates open and were releasing up to 130,000 megalitres per day," said Mr Spiller.

"Releases are expected to continue until towards the end of the week, depending upon any further rainfall."

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All dams throughout South East Queensland have been hovering around 100 per cent capacity since heavy rainfall during early October.

Hinze Dam is continuing to release approximately 5,000 megalitres of water per day through the outlet gates. Several other local dams are continuing to spill.

Mr Spiller said with all the water currently around the area, the community needs to be vigilant about safety around dams, weirs and fast-flowing waters.

"Members of the public need to be aware of the dangers of swimming in weirs and flooded waterways. The facts are that it only takes ankle deep water to knock you off your feet, and only 60 seconds to drown," he said.

"We are discouraging people from visiting Wivenhoe Dam over the next few days to view the gate openings, given how wet the area is and the forecast for further rainfall."

The Water Grid has consulted with Ipswich, Somerset and Brisbane City Councils regarding the decision to release water from Wivenhoe Dam tomorrow.

All releases are being managed in accordance with approved flood management plans. Levels in the Lockyer River were taken into account, with the releases from Wivenhoe Dam timed to allow sufficient time for levels downstream to drop.

The release is expected to result in the closure of Twin Bridges, Colleges Crossing and Savages Crossing.

ENDS

Notes to the editor

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For further information visit www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:
Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

SEQ Water Grid

Media Release

MEDIA RELEASE
11 DECEMBER 2010

Be DAM smart and safe this summer

Key safety representatives today pleaded with members of the community to be DAM smart not DAM stupid this summer.

The Water Grid, Queensland Police Service and Maritime Safety Queensland have joined forces to launch a campaign encouraging the public to be 'DAM smart' on and around South East Queensland dams over summer.

Water Grid spokesperson Dan Spiller said Seqwater Rangers, Queensland Maritime Safety officers and Queensland Police will be conducting patrols around our major dams to enforce safe and responsible behaviour on and off the water.

These patrols will involve random breath-testing of boat operators and drivers, as well as monitoring dangerous or anti-social behaviour.

"With the current combined capacity of our three major dams at around 100 per cent, record numbers of more than 150,000 people are expected to visit Water Grid recreation areas over the Christmas and New Year period," said Mr Spiller.

The campaign's slogan "Don't be DAM stupid", is designed to educate people to 'rethink' their behaviour both on and around our dams.

"The majority of our visitors are very well behaved and make the most of our facilities, however even small amounts of dangerous and anti-social behaviour affect everyone," said Mr Spiller.

Ipswich District Queensland Police Inspector, Kevin Keillor said police would be targeting anti-social behaviour across all the recreational areas, including drink driving both on land and water.

"This is not about stopping people enjoying themselves and having fun, it is about ensuring people act responsibly and consider the safety and comfort of others," Inspector Keillor said.

Maritime Safety Queensland General Manager Patrick Quirk said the most common safety mistake boaties make on inland waterways relates to lifejackets.

"They don't carry enough life jackets or don't have the right size or type of

lifejackets for children. All children under 12 must wear a life jacket," Mr Quirk said.

"If you are waterskiing make sure the skier is wearing the right lifejacket and that someone more than 12 years of age is watching at all times."

Heavy rain events during the holiday season could also result in the dams and recreational areas being closed in the interests of community safety.

For information about Seqwater dams and recreation areas or to help plan your trip visit: www.seqwater.com.au

ENDS

Notes to the editor

As part of the campaign, Seqwater Rangers, Maritime Safety and Queensland Police will be monitoring:

- Excessive alcohol consumption
- Boaties & jet skiers keeping their distance from swimmers and paddlers – 30 metres for boats and 60 metres for jet skies
- People speeding in designated six-knot zones
- People swimming in non-designated areas
- Boating or fishing after dusk
- Use of PFDs
- Boat registrations

Seqwater, the Water Grid's bulk water supplier, is responsible for 24 dams and 49 weirs across South East Queensland. We would like to remind visitors:

- Individual permits are required for boating at Somerset and Wivenhoe
- Fishing permits are required for most dams where fishing is permitted (Further information on individual sites can be found on www.seqwater.com.au)
- Camping is only permitted in designated camp sites. Rangers will be on the lookout for illegal campers on private property
- While some public cooking facilities are available, visitors are advised to bring their own gas bottles and cooking equipment. The lighting of open fires is prohibited.
- Be courteous to other people whether it be on boat ramps, campsites and on the road.
- Don't litter.
- Supervise children at all times.

Background

- Many of our dams allow a range of recreational activities including camping, fishing and swimming.
- Boat permits for Somerset and Wivenhoe can be purchased at a cost of $15 for a Weekly $100 for an annual permit or renewal $75 at the following places:
- Wivenhoe Information Centre
- Fernvale Futures Information Centre, Fernvale
- Somerset General Store, Somerset
- Catchment Cafe, Somerset
- Lake Somerset Holiday Park, Somerset
- Grand Hotel, Esk
- Or directly from Rangers on weekends and holidays
- Boat permits are not required for Atkinson, Maroon, Borumba or Moogerah Dams where fuel-powered boats and skiing are also permitted.

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For further information visit www.seqwgm.com.au

For further details contact the SEQ Water Grid Communications Unit on:
Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Barry Dennien

From: Barry Dennien
Sent: Monday, 13 December 2010 3:15 PM
To: 'Ken Smith'
Subject: RE: Media alert: GATES SET TO OPEN AT WIVENHOE AT 1.00PM
Attachments: image001.gif

Yes, sorry for the delay, release is estimated at 23% of October releases.

barry

From: Ken Smith [mailto:Ken.Smith@premiers.qld.gov.au]
Sent: Monday, 13 December 2010 12:25 PM
To: Barry Dennien
Subject: RE: Media alert: GATES SET TO OPEN AT WIVENHOE AT 1.00PM

Thanks Barry. Understand that far more than a quarter below release levels following October rainfall.

Regards

Ken Smith
Director-General
Department of the Premier and Cabinet

Phone: 07 322 44728 Fax: 3229 2049
Mobile: 0417 730 013
Email: Ken.Smith@premiers.qld.gov.au

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---

om: Barry Dennien [mailto:Barry.Dennien@seqwgm.com.au]
Sent: Monday, 13 December 2010 12:10 PM
To: Ken Smith; John Bradley (JOhn.Bradley@derm.qld.gov.au)
Subject: RE: Media alert: GATES SET TO OPEN AT WIVENHOE AT 1.00PM

Ken

No issues raised, the release is minor and will have very little impact if any on BCC, Ipswich and Somerset will have a few bridge closures and feel the impact a little more.

Barry

From: Ken Smith [mailto:Ken.Smith@premiers.qld.gov.au]
Sent: Monday, 13 December 2010 11:55 AM
To: Barry Dennien; John Bradley (JOhn.Bradley@derm.qld.gov.au)
Subject: FW: Media alert: GATES SET TO OPEN AT WIVENHOE AT 1.00PM

Thanks Barry. No issues with Council ?

Regards

Ken Smith
Director-General
Department of the Premier and Cabinet

Phone: 07 322 44728 Fax: 3229 2049
Mobile: 0417 730 013
Email: Ken.Smith@premiers.qld.gov.au

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From: Barry Dennien [mailto:Barry.Dennien@seqwgm.com.au]
Sent: Monday, 13 December 2010 11:49 AM
To: Bradley John; Ken Smith
Cc: Dan Spiller; Rob Drury; Michael Lyons
Subject: FW: Media alert: GATES SET TO OPEN AT WIVENHOE AT 1.00PM

Ken / John

In accordance with the new flood release protocols I am required to inform you when a release is to be made from Wivenhoe Dam.

All parties to the protocol have been consulted and they raised no concerns with the release strategy.

Note the media release below.

Regards

Barry Dennien

From: SEQWGM Media
Sent: Monday, 13 December 2010 11:20 AM
Subject: Media alert: GATES SET TO OPEN AT WIVENHOE AT 1.00PM

Media alert

Following last night's announcement, one of the five gates at Wivenhoe Dam will be opening today at 1.00pm.

Where: Wivenhoe Dam

When: 1.00pm, Monday 13 December

Photo opportunities: the best photos can be captured from the public viewing platform. This can be accessed by turning left off the Brisbane Valley Highway, near Fernvale.

For further information, please note the media release below.

Barry Dennien

From: SEQWGM Media
Sent: Monday, 13 December 2010 3:55 PM
Subject: Media update - Gate open at Wivenhoe
Attachments: image001.gif

Media update

Controlled releases from Wivenhoe Dam began just after 1pm today.

Water Grid spokesperson, Dan Spiller, said a single spillway gate was open, allowing approximately 30 000 megalitres a day to be released. The gate was opened in 30 minute increments over a two and half hour period until the rate of release reached 300 cubic metres per second at 3.30pm.

The releases are likely to continue over a number of days to return the dam to just below full supply level. The releases are designed to empty Wivenhoe's flood storage compartment in readiness for any further heavy weather.

Mr Spiller said it was advisable that people didn't visit Wivenhoe Dam over the next few days to view the gate openings because of how wet the area is and the forecast for further rainfall.

The Water Grid is working closely with local councils regarding the decision to release water from Wivenhoe Dam and all releases are being managed in accordance with approved flood management plans.

While the gates are open, routine updates will be provided. The next update will be provided mid-morning tomorrow.

Regards
SEQ Water Grid Communications Unit

For further details contact the SEQ Water Grid Communications Unit on:
Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Barry Dennien

From: SEQWGM Media
Sent: Monday, 13 December 2010 4:04 PM
To: Geoff Stead
Cc: SEQWGM Communications Staff; Mike Foster; Paul Bird; Dan Spiller; Barry Dennien; Scott Denner; Elaina Smouha
Subject: Media update - gate open at Wivenhoe Dam
Attachments: image001.gif

Hi Geoff

We have worked with the following media outlets today, driving the dam release /dam safety messages from over the weekend:

- Triple M/B105 (8.00am: phone interview) – news grabs with Dan Spiller, expecting the gates to open later today
- ABC Brisbane (8.30am: phone interview) – news grabs with Dan Spiller, expecting the gates to open later today
- River FM (3.00pm: phone interview) – news grabs with Dan Spiller, discussing release amounts, contact council for local impacts, driving safety messages
- Channel 7 (3.30pm: Water Grid Emergency Management Room) – interview with Dan Spiller, discussing release amounts, contact council for local impacts, driving safety messages
- Channel 9 (3.30pm: Water Grid Emergency Management Room) – interview with Dan Spiller, discussing release amounts, contact council for local impacts, driving safety messages
- Channel 10 – (6.00pm: live at Wivenhoe) – set to do a live weather cross from Wivenhoe tonight. No interview required. Key messages have been supplied

An update has also been issued to media this afternoon confirming that one gate at Wivenhoe is now open.

Regards
Aleisha

Aleisha Coote
Senior Media Advisor
SEQ Water Grid Communications Unit
Phone: (07) 3224 7212 | Fax: (07) 3405 0373
Email: aleisha.coote@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Barry Dennien

From: SEQWGM Media
Sent: Tuesday, 14 December 2010 6:06 AM
To: Barry Dennien; Dan Spiller; Michael Lyons; Scott Denner; Elaina Smouha
Cc: SEQWGM Media
Subject: Fwd: Mediaportal Alert - Morning Report 6:00am

Hi team

Note front page of today's Courier Mail re leaked document from QWC - the CM has published the full dossier online.

Let me know if any actions from our end are needed, otherwise will be handled by Mins Office and QWC. No media calls at this stage.

Aleisha

Sent from my iPhone

Begin forwarded message:

From: "mediaportal@mediamonitors.com.au" <mediaportal@mediamonitors.com.au>
Date: 14 December 2010 5:01:21 AM GMT+10:00
To: SEQWGM Media <media@seqwgm.com.au>
Subject: Mediaportal Alert - Morning Report 6:00am

Hi Joanne Fettke

Your folder – Morning Report 6:00am – has been updated with 15 new media items.

To alter the alert settings on this folder please login to Mediaportal - http://www.mediaportal.com

Toowoomba Chronicle, Toowoomba QLD
General News: 14 December 2010
View Clip View Text

Deluge helps bring dam levels to 36.5%
By: Callum Johnson

THE weekend deluge has brought the combined levels of Cooby, Cressbrook and Perseverance dams to 36.5 per cent of capacity, up 0.7% from Tuesday last week. Things are looking much healthier for Toowoomba's dams compared to this day last year when the combined dam level was only 7.9%.

Item ID: 85990850
ASR: AUD 423
Circulation: 22,644
Page: 5
Number of words: 160
Size: 0kb
Article type: News Item
Photo: No

Toowoomba Chronicle, Toowoomba QLD
General News: 14 December 2010
View Clip View Text

Item ID: 85990146
ASR: AUD 55
Circulation: 22,644

Algae alert

ACCESS to the Gordonbrook Dam has been closed after recent sampling detected high levels of blue green algae. Closure includes access to the boat ramp and fishing from banks

Page: 3
Number of words: 30
Size: 0kb
Article type: News Item
Photo: No

Courier Mail, Brisbane
General News: 14 December 2010

View Clip View Text

Item ID: 85976762
ASR: AUD 41,291
Circulation: 211,230
Page: 1
Number of words: 1077
Size: 657kb
Article type: News Item
Photo: Yes

Drip Feed

By: Steven Wardill

A TOP-SECRET dossier has exposed the embarrassing water issues plaguing the Bligh Government many of which it has tried to deny or deflect. The document details almost every crucial issue facing the Government's troubled administration of water, as well a host of bungles that will leave top bureaucrats red-faced.

Queensland Times, Ipswich QLD
General News: 14 December 2010

View Clip View Text

Item ID: 85983132
ASR: AUD 1,030
Circulation: 10,512
Page: 17
Number of words: 312
Size: 0kb
Article type: News Item
Photo: No

Water torture bill for Scenic Rim residents

By: Melanie Maeseele

SCENIC Rim residents are paying a high price for quality water more than their rural counterparts. Recent water bills distributed to residents in South East Queensland from Queensland Urban Utilities (QUU), the new corporation which distributes water to residents in the region, shows Scenic Rim residents have to pay up to 30 cents more a kilolitre than residents living in the Brisbane or Lockyer valleys.

Gold Coast Bulletin, Gold Coast QLD
General News: 14 December 2010

View Clip View Text

Item ID: 85985263
ASR: AUD 126
Circulation: 39,593
Page: 10
Number of words: 83
Size: 0kb
Article type: News Item
Photo: No

Dam floodgate opened

WATER authorities yesterday opened a spiliway at Wivenhoe Dam to empty the flood storage compartment before further heavy downp ours arrive. The controlled release at the dam, 80km northwest of Brisbane, began at 1pm.

Queensland Times, Ipswich QLD
General News: 14 December 2010

View Clip View Text

Item ID: 85983003
ASR: AUD 2,052
Circulation: 10,512
Page: 1
Number of words: 434

Here we flow again at Wivenhoe

Wivenhoe Dam. South East Queensland Water Grid management yesterday announced that one of the five gates was opened at 1pm, allowing a daily average of 30,000 megalitres to gush down the Brisbane River.

Size: 0kb
Article type: News Item
Photo: Yes

Beaudesert Times, Beaudesert QLD
General News: 08 December 2010

View Clip View Text

Item ID: 85631649
ASR: AUD 940
Circulation: 3,951
Page: 5
Number of words: 459
Size: 0kb
Article type: News Item
Photo: Yes

Dams are overflowing

By: Natalie Hart

THE drought is well and truly over for farmers relying on water from Maroon and Moogerah Dams, with water flowing over the storage spillways for the first time in recent memory. On the back of sustained rainfall in the region over the past month, Moogerah Dam this week returned to being full for the first time since 1991, while Maroon Dam is at its highest level ever at 44,319ML, and has been at 100 per cent for several weeks.

Fassifern Guardian, Boonah QLD
General News: 08 December 2010

View Clip View Text

Item ID: 85632380
ASR: AUD 331
Circulation: 2,912
Page: 10
Number of words: 320
Size: 0kb
Article type: News Item
Photo: No

E-petition launched against $27 billion Coal Seam Gas industry

A SCENIC Rim-based environmental action group has launched an e-petition against the coal seam gas industry Scenic Rim Action Group (SRAG) member Andy McCann, explained that the group has joined forces with two other action groups to launch the e-petition.

Brisbane Valley Kilcoy Sun, Kilcoy QLD
General News: 03 December 2010

View Clip View Text

Item ID: 85633612
ASR: AUD 79
Circulation: 2,520
Page: 6
Number of words: 108
Size: 72kb
Article type: News Item
Photo: No

Pollution probes

A CREEK in the Coominya area has been allegedly polluted by the release of contaminants from a quarry The incident was jointly investigated by Somerset Council Environmental Health officers and the Department of Environment and Resource Management (DERM). It is now the subject of ongoing enforcement action by DERM.

Brisbane Courier-Mail
www.couriermail.com.au Date found: 13 December 2010 06:19PM

ASR: AUD 1,600
Unique Daily Visitors: 28,622
Av. Story Audience: 1,201

Floodgates opened at Wivenhoe Dam as more heavy downpours are expected

OVERFLOW: The floodgates are open at Wivenhoe Dam sending water over thespillway. Pic: Jono

empty the flood storage compartment in preparation for further...

Read full story on source web site

Keywords

WATER (1), Queensland (2), Water (2), South East (1), water (4), southeast (1).

Brisbane Times
www.brisbanetimes.com.au Date found: 13 December 2010 06:35PM

ASR: AUD 45
Unique Daily Visitors: 22,250
Av. Story Audience: 207

Wivenhoe Dam floodgates open

Water authorities have opened a spillway at Wivenhoe Dam to empty the flood storage compartment in preparation for further heavy downpours in southeast Queensland. The controlled water release at the dam 80 kilometres northwest of Brisbane, began at...

Read full story on source web site

Keywords

water (3), Queensland (2), Water (3), South East (1), southeast (1).

Courier Mail, Brisbane
General News: 14 December 2010

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Item ID: 85976785
ASR: AUD 1,736
Circulation: 211,230
Page: 5
Number of words: 188
Size: 0kb
Article type: News Item
Photo: No

Bligh's bluster at leak fooling nobody

By: Steven Wardill

THE Bligh Government will today attempt to mount a "dog ate our homework" argument over the latest damaging water leak to strike its administration. Their faux defence will be led with angry denials and claims that unscrupulous individuals had concocted this document in a bid to get even with them.

Courier Mail, Brisbane
General News: 14 December 2010

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Item ID: 85976815
ASR: AUD 2,582
Circulation: 211,230
Page: 9
Number of words: 354
Size: 0kb
Article type: News Item
Photo: No

Teen drowns as rescue fails

By: Peter Michael Robyn Ironside

A TEENAGE girl died in her friends' arms as she was swallowed in a raging torrent of flash flooding at a popular north Queensland swimming hole. Friends and onlookers fought in vain to keep 17-year-old Che-Nezce Perrie Shepherd's head above water when her foot became wedged between rocks in Alligator Creek, south of Townsville, at about 330pm on Sunday.

Brisbane Courier-Mail
www.couriermail.com.au Date found: 14 December 2010 01:29AM

ASR: AUD 4,955
Unique Daily Visitors: 28,622
Av. Story Audience: 1,201

Secret dossier reveals water woes

BUNGLE DOSSIER: A top-secret dossier has exposed almost every crucial issue facing the Government's troubled administration of water, as well a host of bungles that will leave top bureaucrats red-faced. Source: The Courier-Mail A TOP-SECRET dossier has...

Read full story on source web site

Keywords

Queensland (1), Water (1), Tugun Desalination (1), plant (2), water (13), Commission (1), Plant (1), plants (1).

Sunshine Coast Daily, Maroochydore QLD
General News: 13 December 2010

View Clip View Text

Item ID: 85907982
ASR: AUD 1,721
Circulation: 20,603
Page: 2
Number of words: 509
Size: 0kb
Article type: News Item
Photo: No

Rescues swamp stretched crews

By: Damian Bathersby

THE Sunshine Coast was spared much of the mayhem as torrential rain swept through South-East Queensland yesterday, sparking a series of dramatic rescues. A family escaped from their vehicle after it became submerged in a flooded section of the D'Aguilar Highway, west of Kilcoy, about midday but most of the drama occurred further north.

Barry Dennien

From: SEQWGM Media
Sent: Tuesday, 14 December 2010 10:33 AM
Subject: Media update - 14 December 2010 - Wivenhoe Dam gate releases
Attachments: image001.gif

Media update (Morning)
14 December 2010

Controlled releases from Wivenhoe Dam began just after 1pm yesterday through a single gate, and are expected to continue until later this week.

As a result of this release activity, Atkinson's Crossing at Lake Wivenhoe is closed to the launching of canoes/kayaks and any other vessels until further notice.

Cone valves are currently releasing water from Somerset Dam into Wivenhoe Dam and the Hinze Dam emergency gate is being systematically closed.

Inflows into North Pine Dam are being monitored to determine whether a spill gate release is required.

Telephone - 1800 613 122 has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils**.

The Water Grid will continue to work with local councils regarding the release water from Wivenhoe Dam. All releases are being managed in accordance with approved flood management plans.

Note to the Editor: While Wivenhoe is spilling routine updates will be provided mid morning and mid to late afternoon.

Regards
SEQ Water Grid Communications Unit

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Barry Dennien

From: Barry Dennien
Sent: Tuesday, 14 December 2010 2:11 PM
To: Shion Yee
Cc: Dan Spiller
Subject: FW:
Attachments: WIVENHOE DAM - Storage Lowering Investigation.docx; WIVENHOE DAM - Storage Lowering Investigation.docx

Shion

Have a read of the response below and attached documents before we meet.

Barry

From: Rob Drury [mailto:rdrury@seqwater.com.au]
Sent: Thursday, 9 December 2010 12:11 PM
To: Barry Dennien; Jim Pruss
Cc: Dan Spiller; Peter Borrows
Subject: RE:

Barry,

To question 1, no it wasn't modelled mainly because the bigger the event, the much less impact of the reduced FSL. But yes to Question 2 in that this was considered. However the following may help summarise and also offer a way to give the proposal a more detailed analysis in the future.

Basically, there are an unlimited number of scenarios containing an infinite number of rainfall patterns and distributions producing flood events in the Brisbane River for flows both above and below 3500 cumecs. Seqwater has not attempted to model each scenario in the discussion paper or even a variety of scenarios. A major study would be required to undertake this exercise and the study that Seqwater has been commissioned to undertake for the Water Commission relating to raising the Wivenhoe Dam Full Supply Level will consider these issues. This study is scheduled to commence in the new year and take in the order of six months.

The main point to be noted from the discussion paper is that having a relatively small volume of water to fill below the dam FSL provides only limited benefits and the larger the flood, the smaller these benefits will potentially be (although unusual rainfall patterns could produce exceptions). The reason for the reducing potential benefit as flood size increases is due to the reducing proportion of the available volume below FSL to the total flood volume. The other factor is that the available storage volume below FSL is generally only a very small proportion of the total flood storage unless the dam is below around 50% capacity.

Generally although the lower Wivenhoe Dam is at the commencement of the event, the smaller the downstream impacts, as the events get bigger the impact reduction will generally decrease and may be insignificant. And during smaller events, the impact is less significant anyway. Quantifying the exact size of the potential benefit for a range of scenarios will take a major study and as previously discussed, this work will commence in the new year.

Hence to gain any significant benefit, Wivenhoe would have to be considerably lower at the start of an event and assuming the dam would not be kept at 50% or 75% continually, the point to really consider is how does Seqwater lower the storage below FSL before an event. Once rain commences it will generally be too late, as a release strategy may already be optimised to control downstream flood impacts, so increasing releases to lower the storage level will likely worsen those downstream flood impacts. That is, if there are significant flows downstream, it is already too late to pre-release.

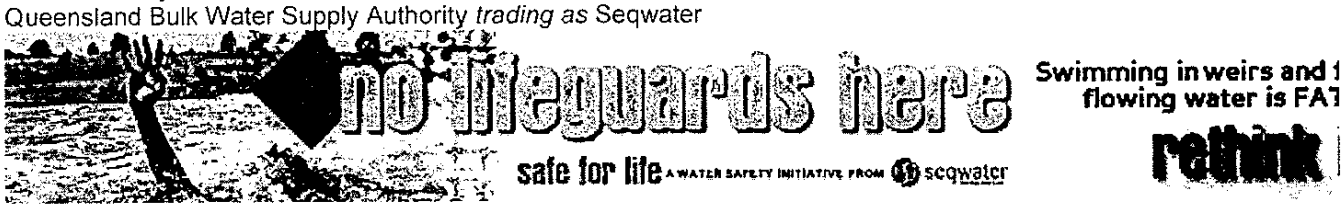
The other option is to pre-release based on forecast and before the rain event is underway. However, as seen in recent events, lowering storage levels based on forecast and before the event initiates, is a strategy containing many risks including:

- Causing unnecessary downstream impacts when rainfall below forecast levels is experienced.
- Standing accused of wasting precious water resources when rainfall below forecast levels is experienced.
- Unnecessarily extending bridge inundation times and disrupting irrigation activities downstream of Wivenhoe Dam.
- Unnecessarily increasing river turbidity downstream of Wivenhoe Dam.

In summary, much thought and investigation by many people has gone into developing the current Manual of Flood Mitigation for Wivenhoe and Somerset dams. The Manual should not be modified lightly and certainly not without suitable engineering investigations being undertaken. Seqwater will undertake extensive investigations for the Water Commission in the new year to examine the possibility of raising the full supply level of Wivenhoe Dam. At this stage it is suggested that the scope of this work be widened to consider not just raising the water level in the dam, but also examining in detail the costs and benefits of modifying the manual of Flood Mitigation to allow "pre-lowering" of storage levels based on forecast rainfall at the onset of potential flood events.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

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PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Barry Dennien [mailto:Barry.Dennien@seqwgm.com.au]
Sent: Wednesday, 8 December 2010 8:23 AM
To: Jim Pruss; Rob Drury
Cc: Dan Spiller; Peter Borrows
Subject:

Hi Jim Rob

The Minister is attending our Board meeting this Monday and given the public debate on Wivenhoe levels is very much front of mind (attached) he will ask on the status of the modelling work. I received your update the other day thankyou, I had a few extra questions, is there any chance on your thoughts before Monday, not necessarily any new model runs before then.

Regards

Barry

Rob

Thanks for the report. Thanks for the additional BOM advice.

I note the good work on modelled sensitivities for flows below 1900m3/sec – W1 strategy (flood manual)

The report then jumps to greater than 3500m3/sec (W4 strategy) and comments how peak water levels would unlikely be impacted and it comments that dam volume reductions of 250,000 megalitres (reduction 20% dam level) would be needed for any significant reduction in water level peaks.

Q1. Was the >3500m3/sec modelled like the October event < 1900M3/sec to draw the above conclusions.

Q2. Was the flow between 1900 and 3500 m3/sec modelled (Strategy W2 W3) with various dam levels to ascertain benefits to peak levels or bridge outage durations

Q3. If no to 1 and 2 is it worth doing considering we make the comments above about maybe a benefit if we have 250,000 ML extra storage.

Regards

Barry

DAM FULL SUPPLY LEVEL (FSL) INVESTIGATIONS
SEQWATER GATED STORAGES

INTRODUCTION

The following short paper examines the issues associated with temporary lowering the full supply levels of Seqwater's gated dams to improve short term flood mitigation benefits. The paper considers Wivenhoe Dam, Somerset Dam, North Pine Dam and Leslie Harrison Dam.

WIVENHOE DAM AND SOMERSET DAM

Wivenhoe Dam and Somerset dam control only 50% of the Brisbane River catchment (Bremer River and Lockyer Creek catchments are not controlled), therefore the Flood Mitigation benefits provided by the dam will depend on the rainfall distribution experienced during a flood event. This makes it difficult to quantify exactly the benefits of lowering the storage in anticipation of possible flood rains.

There are primarily two types of flood events that may occur in the Brisbane River Catchment. There are the smaller events that impact primarily on the rural bridges upstream of Moggill and the larger events that impact on urban areas in Brisbane. The threshold that separates these two events is a river flow of around 3500 cubic metres per second at Moggill. To understand the possible benefits of lowering the storage to reduce flooding impacts, it makes sense to discuss these two types of events separately.

Events Impacting on Bridges (Moggill Flow < 3500m^3/s) – Limited Urban Impacts

In recent history, flood events of this nature occurred in April 1989, February 1999 and October 2010. The flow characteristics of events of this type are shown in the following table.

Event	Wivenhoe Dam					
	Starting Level		Volume Of Inflow	Volume Of Outflow	Peak Outflow	Peak Water Level
	m AHD	%	ML	ML	m3/s	m AHD
Early April 1989	67.06	>100	690,000	690,000	1,620	69.78
Late April 1989	67.00	100	870,000	820,000	1,490	71.45
February 1999	63.92	<100	1,220,000	900,600	1,800	70.45
October 2010	67.03	>100	640,000	640,000	1,300	69.65

The October 2010 event was examined to determine the benefits of lowering the storage level. This event commenced with the dam at FSL. The event was examined with the dam at 95% capacity, 90% capacity, 80% capacity, 50% capacity and empty at the commencement of the event. The results are shown in the following table. When reading the table it is important to understand that the bridges are impacted not just by outflows from Wivenhoe, but also by flows from the uncontrolled areas of the river catchment. Accordingly, the location of a bridge within the system will dictate the size of catchment area that will impact on the bridge. All inundation times shown in the table are approximations only, made for the purposes of this investigation.

Dam Percentage Full at Event Commencement	Approximate Duration of Wivenhoe Radial Gate Releases/ Twin Bridges Inundation (hours)	Approximate Duration of Savages Crossing and Colleges Crossing Inundation (hours)	Approximate Duration of Burtons Bridge and Kholo Bridge Inundation (hours)	Peak Flow at Moggill (m^3/s)
100%	230	247	183	1848
95%	187	214	183	1848
90%	185	214	183	1841
80%	172	214	183	1786
50%	130	214	153	1722
0%	0	189	38	940

The table shows that the reduction in FSL won't have a large impact on Bridge inundation times. A reduction in the order or 36 hours or 15% of the total inundation time may be possible for the low level bridges only. The reductions are generally caused by the delay in release commencement associated with the lower starting FSL. However, the bridges can often already inundated at this time anyway due to flood inflows into the Brisbane River from the 50% of the catchment not controlled by Wivenhoe Dam. Lowering the FSL of the dam has no impact on such inundations as shown in the table.

For events smaller than those considered above, it should be noted that the Manual of Flood Mitigation allows a trigger level buffer of 27500 megalitres above FSL and this has the effect of protecting Twin Bridges and the lower level bridges from inundation as a result of minor events. Twin Bridges is essentially a low level causeway that is inundated following any radial gate release. This inundation could possibly be prevented by raising the bridge deck level. Regardless, the areas accessed using this bridge can also be accessed using the Fernvale Bridge. It is acknowledged however that the closing of Twin Bridges causes inconvenience to local residents, as it adds approximately another five kilometres to the journeys to and from their residences. Approximately 40 residences and several businesses (primarily turf farms) are impacted.

Events Impacting on Urban Areas (Moggill Flow > 3500m^3/s) – All rural bridges inundated

Events of this nature have not been experienced since the construction of Wivenhoe Dam was completed in 1984, with the last event of this nature being experienced in 1974. The inflow volume into Wivenhoe Dam associated with the 1974 event has been estimated to be in the order of 1.5 million megalitres. However during the 1974 event, an additional 1.5 million megalitres of flood flow impacting of the urban areas of Brisbane originated from catchment areas that are not controlled by Wivenhoe Dam.

For events of this nature, it is unlikely that peak water levels in Brisbane would be significantly impacted by minor reductions in the level of Wivenhoe Dam. Certainly reductions in dam volume in the order of at least 250000 megalitres would be needed to provide any significant reduction in water level peaks experienced in urban areas. Additionally, reductions in the FSL of this order would not necessarily guarantee reductions in urban flood levels, as the effectiveness of Wivenhoe Dam in reducing urban flood levels is

directly dependant on the distribution of rainfall in the Brisbane River catchment during a flood event (Wivenhoe Dam controls only 50% of the total Brisbane River catchment) and the spacing between individual flood events.

NORTH PINE DAM

North Pine Dam has no flood mitigation potential. Unlike Wivenhoe Dam, once the dam has reached FSL, all water flows into the dam must be released to protect the structural safety of the dam.

Any radial gate operation at North Pine Dam to release flood water, results in inundation of Youngs Crossing Road, so lowering the FSL is problematic and may best be achieved by increasing the daily water diversion to the North Pine Dam Water Treatment Plant. There are river release valves that allow some water to be drained from North Pine Dam without inundating Youngs Crossing. These valves have been operated continuously since the recent gate releases to manage residual inflows into the dam. However outflows from these valves are restricted to flows in the order of several hundred megalitres per day as larger flows will adversely impact on Youngs Crossing. Certainly a small reduction in the level of North Pine Dam is potentially beneficial in preventing closures of Youngs Crossing Road associated with small storm events.

It should be noted however that Youngs Crossing Road is also impacted by uncontrolled flood flows from Lake Kurwongbah and local storm run-off. In recent times Youngs Crossing Road has been closed by flood water during times when no water releases were being made from North Pine Dam, but when storm rains resulted in flood flows from uncontrolled areas of the catchment.

The table below gives an indication of the rainfall required to operate for NPD:

Level	Capacity			Rainfall Required to Operate	
				Wet Conditions	Dry Conditions
	m AHD	%	ML	mm	mm
FSL	39.60	100.0%	214,302	5	60
Reduced FSL	39.10	95.0%	203,618	35	100

Recent changes to the Manual of Flood Mitigation for North Pine Dam allows for some ability to retain up to 2500 megalitres of water to reduce impacts on Youngs Crossing Road, provided favourable weather forecasts are experienced. However the preferred option to reduce public inconvenience associated with storm events would be to raise the flood immunity of the river crossing on Youngs Crossing Road. This crossing is primarily a low level causeway that is potentially unsuitable given the volume of traffic that now uses this crossing on a daily basis.

LESLIE HARRISON DAM

Similar to North Pine Dam, Leslie Harrison Dam has no flood mitigation potential. Once the dam has reached FSL, all water flows into the dam must be released to protect the structural safety of the dam.

The dam is relatively small with a total full supply storage volume of only 24800 megalitres, against an inflow volume during a 72 hour 1 in 50 year storm event of over 30000 megalitres. Flood gate operations at Leslie Harrison Dam do not impact on public roads and generally only inconvenience the general public during large flood events. Reductions in this inconvenience cannot be achieved by small reductions in dam storage level.

Summary of comments

The attached paper summarises an analysis that changing the initial storage level of dams has on downstream flood impacts.

Wivenhoe/Somerset System

The analysis shows that for some minor floods similar to October 2010, reducing the starting volume of Wivenhoe Dam by 5% or 10% has minimal impacts on impacts downstream. The main benefit being that inundation times for downstream bridges will be reduced but only by around15%. However peak water levels are not affected. There are minimal potential benefits to downstream bridge until dam levels are reduced down to about 50% of capacity.

These results are not unexpected as Wivenhoe has such a large flood storage. Adding say 100,000ML to the flood storage (equates to reducing the storage volume by 10%) does not appreciably increase this available flood storage.

It should also be noted that in many cases, Wivenhoe flood releases will be made following the peaks of inflows into the Brisbane River from the Lockyer and Bremer Catchments. Certainly during many events, Lockyer Creek could already have inundated most or all of the road crossings downstream of Wivenhoe Dam. In these instances, a small amount of additional flood storage in the dam provides minimal benefit.

Another option considered was pre-releasing Wivenhoe water in anticipation of a flood event. This is not considered a viable option for the following reasons:

- Regardless of forecast, there is never any certainty on the amount of rain that will fall within a dam catchment. For example, on 29 November 2010, the quantitative forecast from BOM for the Wivenhoe Catchment was 25 to 50 millimetres. Actual rainfall received was in the order of 10 millimetres. On a saturated catchment this could equate to a runoff discrepancy of hundreds of thousands of megalitres. A pre-release of anticipated flood water based on forecast could result in major embarrassment.
- Any significant pre-release of water would result in bridge inundation below Wivenhoe Dam.
- Any pre-release of water from Wivenhoe Dam will take at least 24 hours to reach the lower end of the Brisbane River system. Rains occurring in the catchments below the dam over this period could potentially worsen downstream flood impacts.

The Bureau of Meteorology has been contacted and they have confirmed the above forecast reliability assessment. They advised that, whilst weather prediction models are steadily improving, the forecast of rainfall amounts over catchment time/space scales is recognised as one of the most challenging/difficult tasks. Detailed rainfall forecasting is not deterministic - the uncertainties involved are often expressed in probablistic forecasts and whilst there is often the ability to forecast the potential for a significant rain event to occur in the southeast Qld-northern NSW region, it is difficult (if not impossible) to predict the actual location of the heaviest rain, even with only a few hours notice.

The Queensland Director of Dam Safety (Mr Peter Allen) was contacted and he confirmed the assessment that minor reductions in the stored volume of Wivenhoe Dam would have

minimal impacts on floods downstream and concurred with the risks involved in any pre release of significant volumes of water from dams prior to an event.

North Pine and Leslie Harrison Dams

Lowering the normal FSL for North Pine and Leslie Harrison Dams will have minimal impact on major floods and may not decrease releases depending on the size of even minor events. However lowering the level of North Pine Dam after a flood release to between 95% and 100% may reduce the frequency of operations in some rain events although the main benefit is in operational efficiency as it provides more time for response and may reduce making releases in a minor storm event.

Similarly reducing Leslie Harrison level to around 95% after or before an event could assist in reducing call out of staff and manning the storage for minor releases and even the timing of releases.

Normally both dams are returned to just under 100% after an event based on base inflows still occurring and possible further rain. Allowing the dams to reduce to around 95% improves the operational leeway. However this could best be provided by an operational arrangement where the WGM simply agrees Seqwater has the operational latitude to reduce both storages to between 95% and 100% after an event or when there is some inflow and Seqwater can decide the exact level based on ongoing inflows and possible predicted rainfall, but not going below 95%.

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Barry Dennien

From: SEQWGM Media
Sent: Wednesday, 15 December 2010 9:58 AM
Subject: Media update - 15 December 2010 - Wivenhoe Dam gate releases
Attachments: image001.gif

Media update – Dam releases – 15 December 2010 (Morning)

Releases from Wivenhoe Dam are continuing, after one gate was opened at 1.00pm, 13 December 2010, with flows remaining steady at approximately 26,000 megalitres per day.

A release was made overnight from North Pine Dam, in consultation with the Moreton Shire Regional Council. The spillway gates were closed at 5.00 am this morning.

Telephone - 1800 613 122 has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils.**

The Water Grid will continue to work with local councils regarding the release water from Wivenhoe Dam. All releases are being managed in accordance with approved flood management plans.

For further information on the Water Grid: www.watergrid.com.au

Note to the Editor: While Wivenhoe is spilling routine updates will be provided mid morning and mid to late afternoon.

ENDS

Regards
SEQ Water Grid Communications Unit

For further details contact the SEQ Water Grid Communications Unit on:
Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Barry Dennien

From: SEQWGM Media
Sent: Wednesday, 15 December 2010 4:24 PM
Subject: Media update - 15 December 2010 - Wivenhoe Dam gate releases
Attachments: image001.gif

Media update – Dam releases – 15 December 2010 (Afternoon)

The single spillway gate, currently releasing water from Wivenhoe Dam, is expected to close on 16 December 2010. It was opened on Monday 13 December 2010 at 1.00pm and has been releasing a steady flow of approximately 30,000 megalitres per day as part of a controlled programme to return the dam to full supply level.

A release was made overnight from North Pine Dam, in consultation with the Moreton Shire Regional Council. The spillway gates were closed at 5.00 am this morning.

Telephone - 1800 613 122 has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils.**

The Water Grid will continue to work with local councils regarding the release water from Wivenhoe Dam. All releases are being managed in accordance with approved flood management plans.

For further information on the Water Grid: www.watergrid.com.au

Note to the Editor: While Wivenhoe is spilling routine updates will be provided mid morning and mid to late afternoon.

ENDS

Regards
SEQ Water Grid Communications Unit

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Barry Dennien

From: SEQWGM Media
Sent: Thursday, 16 December 2010 10:08 AM
Subject: Media update: Dam releases
Attachments: image001.gif

16 December 2010

Media update: Dam releases

The single spillway gate, currently releasing water from Wivenhoe Dam, will close later this morning.

Somerset Dam is continuing to release a daily estimate of 12,000 megalitres of water into Wivenhoe Dam.

The impact of yesterday afternoon's storm will likely see a small release of water made from Leslie Harrison Dam later today.

There have been no further releases from North Pine Dam or Hinze Dam.

A telephone number - 1800 613 122 - has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on potential impacts in their local areas should direct inquiries to their local councils.

All releases are being managed in accordance with approved flood management plans.

For further information on the Water Grid: www.watergrid.com.au

ENDS

Notes to the editor

About the SEQ Water Grid

Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

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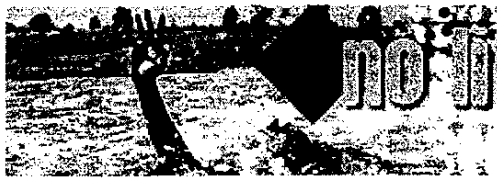
Ph: (07) 3247 3000 | Email: media@seqwgm.com.au



no lifeguards here

A WATER SAFETY INITIATIVE FROM

Swimming in weirs and f
flowing water is FA1

rethink

Barry Dennien

From: SEQWGM Media
Sent: Thursday, 16 December 2010 4:32 PM
Subject: Media update - dam releases
Attachments: image001.gif

16 December 2010

Media update: Dam releases

The single spillway gate at Wivenhoe Dam has been closed today. Inflows to the dam will continue to be closely monitored.

The Atkinson's Crossing at Lake Wivenhoe remains closed to the launching of canoes, kayaks and any other vessels until further notice.

Somerset Dam is continuing to release a daily estimate of 12,000 megalitres of water into Wivenhoe Dam; however these releases will be reduced over the next 24 hours.

North Pine Dam is being closely monitored following today's heavy rainfall and there is a possibility of a small, controlled release taking place over the next 24 hours.

A small release is currently being made from Leslie Harrison Dam after the impact of yesterday's storm; however the gates at Leslie Harrison Dam are expected to close this afternoon.

There are no releases planned for Hinze Dam at this stage.

The Water Grid team has advised that due to recent rainfall events, Lake Maroon has been closed to swimming and skiing as a precaution, until further notice. Boating and fishing is still permitted.

A telephone number - 1800 613 122 - has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on potential impacts in their local areas should direct inquiries to their local councils.

All releases are being managed in accordance with approved flood management plans.

For further information on the Water Grid: www.watergrid.com.au

ENDS

Notes to the editor

About the SEQ Water Grid

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For further information visit www.seqwgm.com.au

For further details contact the SEQ Water Grid Communications Unit on:
Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Barry Dennien

From: Michael Lyons
Sent: Tuesday, 21 December 2010 7:23 AM
To: Barry Dennien; Dan Spiller; Reilly Bob
Subject: FW: Brisbane City Council Community Service Announcement: Potential forminor tidal flooding

Barry – after much lead-up liaison and harmonising yesterday, BCC decided to remove any mention of Wivenhoe and its releases from their media release. Good outcome.

Regards

Mike

From: Lisa.M Martin [mailto:Lisa.M.Martin@brisbane.qld.gov.au]
Sent: Monday, 20 December 2010 7:11 PM
To: John Adcock; Shelley Banks
Subject: Fwd: Brisbane City Council Community Service Announcement: Potential forminor tidal flooding

FYI. This is the version that went out in the end.
Cheers.

Lisa Martin
Media Officer, Marketing and Communication | Marketing and Communication Branch
Corporate Strategy Office | BRISBANE CITY COUNCIL
Brisbane Square | Level 19, 266 George Street, Brisbane, Qld 4000
Phone: 07 3403 6326
Email: Lisa.M.Martin@brisbane.qld.gov.au

Web: http://www.brisbane.qld.gov.au/
Twitter: http://twitter.com/brisbanecityqld
Facebook: http://www.facebook.com/BrisbaneCityCouncil

>>> "Media Release" <MediaRelease@Mediamonitors.com.au> 20/12/2010 7:07:34 pm >>>
Potential for minor tidal flooding
20 December, 2010

With a combination of recent rain and its associated effects and higher than usual tides caused by an atmospheric anomaly residents are advised minor tidal flooding may occur in a handful of areas in coming days.

Brisbane may experience minor tidal flooding on some local streets in the next few days based on mapping by Brisbane City Council and modelling by the Bureau of Meteorology. Some roads, parked cars and paddocks may be affected if tidal flooding occurs.

Tomorrow, minor tidal flooding may occur before and after the high tide peak of 2.48 metres at 9.29am (Brisbane Bar) in low lying areas near tidal waters including:

- Victoria and Northey streets, Windsor
- in the vicinity of Park, Amy, Agnes and Edmonstone streets, Albion: and
- on low lying land in the vicinity of Youngs Road, Hemmant

Council will also be monitoring neighbouring streets in these areas.

Wednesday's high tide of 2.54 metres is expected at 10.11am (Brisbane Bar).

Users of the Bicentennial Bikeway along Coronation Drive are encouraged to take care following flooding on the path over the past few days.

Brisbane City Council crews are now working to clear debris from the path that was left in the wake of floodwaters.

Residents can find out where flooding may occur from creeks, rivers and storm tides by downloading the Flood Flag map for their suburb. These maps are free for download and are available from Council's website at www.brisbane.qld.gov.au/floodwise

For more information, phone Council on 3403 8888.

-ENDS-

Media Contact (not for publication):
Lisa Martin
Media Officer
0403 041 510
Lisa.M.Martin@brisbane.qld.gov.au

Barry Dennien

From: Barry Dennien
Sent: Tuesday, 21 December 2010 7:27 AM
To: Michael Lyons
Subject: Re: Brisbane City Council Community Service Announcement: Potential forminor tidal flooding

Agree

Regards
Barry Dennien

On 21/12/2010, at 7:22 AM, "Michael Lyons" <Michael.Lyons@seqwgm.com.au> wrote:

> Barry – after much lead-up liaison and harmonising yesterday, BCC decided to remove any mention of Wivenhoe and its releases from their media release. Good outcome.
>
> Regards
>
> Mike

From: Lisa.M Martin [mailto:Lisa.M.Martin@brisbane.qld.gov.au]
Sent: Monday, 20 December 2010 7:11 PM
To: John Adcock; Shelley Banks
Subject: Fwd: Brisbane City Council Community Service Announcement: Potential forminor tidal flooding

FYI. This is the version that went out in the end.
Cheers.

Lisa Martin
Media Officer, Marketing and Communication | Marketing and Communication Branch
Corporate Strategy Office | BRISBANE CITY COUNCIL
Brisbane Square | Level 19, 266 George Street, Brisbane, Qld 4000
Phone: 07 3403 6326
Email: Lisa.M.Martin@brisbane.qld.gov.au

Web: http://www.brisbane.qld.gov.au/
Twitter: http://twitter.com/brisbanecityqld
Facebook: http://www.facebook.com/BrisbaneCityCouncil

>>> "Media Release" <MediaRelease@Mediamonitors.com.au> 20/12/2010 7:07:34 pm >>>
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- Victoria and Northey streets, Windsor
- in the vicinity of Park, Amy, Agnes and Edmonstone streets, Albion: and
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For more information, phone Council on 3403 8888.

-ENDS-

Media Contact (not for publication):
Lisa Martin
Media Officer
0403 041 510
Lisa.M.Martin@brisbane.qld.gov.au

Barry Dennien

From: Dan Spiller
Sent: Tuesday, 21 December 2010 8:26 AM
To: Barry Dennien; Michael Lyons
Subject: Fwd: Technical Report W13
Attachments: Seqwater_No-Lifeguards-Here_email_strap.png; ATT00001.htm; cidimage001.png@01CA24E1.BDB90020; ATT00002.htm; Technical Stuation Report W13.docx; ATT00003.htm

Begin forwarded message:

From: Rob Drury <rdrury@seqwater.com.au>
Date: 21 December 2010 7:59:59 AM GMT+10:00
To: Dan Spiller <Daniel.Spiller@seqwgm.com.au>
Cc: Jim Pruss <jpruss@seqwater.com.au>, Peter Borrows <pborrows@seqwater.com.au>, Mike Foster <mfoster@seqwater.com.au>
Subject: Technical Report W13

Please find attached report W13.

Again, all discussions and communications with Councils have indicated no issues at this stage other than those everyone is aware of and managing.

Rob

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater

Ph (07) 54278131 | Fax (07) 54261097 | M 0419378740 | E rdrury@seqwater.com.au

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306

Website | www.seqwater.com.au

TECHNICAL SITUATION REPORT

TSR Number	W13	Date of TSR release	21.12.2010	Time of TSR release	7.30am

Seqwater status of inflows and dam operations

Somerset/Wivenhoe Dams

Somerset Dam

Gate operations are occurring at Somerset Dam and are expected to continue until at least Wednesday 22 December 2010 assuming no further rainfall. Two sluice gates are currently releasing about 410 m3/s from the dam into Lake Wivenhoe.

Somerset Dam peaked at EL 100.43 m AHD at around 13:00 on Monday 20 December 2010 and the lake level is slowly falling. Somerset Dam is currently at EL 100.23 m AHD, (114 % of capacity).

The estimated inflow into Somerset Dam to date is 110,700 ML, of which 67,500 ML has been discharged into Wivenhoe Dam.

Continued gate operations may be necessary if forecast rainfall from Wednesday to Monday results in subsequent river rises.

Wivenhoe Dam

Gate operations are occurring at Wivenhoe Dam and are expected to continue until Thursday 23 December 2010 assuming no further rainfall. Releases from the dam have been steadily increased overnight with a maximum release rate of about 1,280 m3/s being established at 05:00 today. This flow rate will be maintained until early Thursday 23 December 2010, when releases will be reduced as the flood storage compartment is emptied.

Wivenhoe Dam peaked at a level of EL 68.24 m AHD at approximately 04:00 this morning. The current level is EL 68.22 m AHD (112% of capacity) and falling slowly.

The estimated inflow into Wivenhoe Dam to date (excluding releases from Somerset Dam) is 157,900 ML, of which 103,000 ML has been released. The total estimated inflow into both dams for this event, based upon rainfall to date is 310,000 ML.

Continued gate operations may be necessary if forecast rainfall from Wednesday to Monday results in subsequent river rises.

Impacts of Releases

The increased release from Wivenhoe Dam has resulted in elevated levels in the Lower Brisbane River. Twin Bridges, Savages Crossing and Colleges Crossing were inundated earlier in the event. As a consequence of the increased release from Wivenhoe Dam, Burtons Bridge was inundated at around 00:40 on Tuesday 21 December 2010. Kholo Bridge is also expected to be inundated by mid-morning today as the increased releases reach the lower Brisbane River. In accordance with the adopted

operational strategy these bridges should be back in service by late Thursday and all bridges (with the possible exception of Twin Bridges) should be trafficable for Christmas providing no further rainfall occurs.

Advice from the BoM regarding predicted tides in the Brisbane River at the City Gauge, suggest that peak levels (1.6 to 1.8 m AHD) may reach or slightly exceed the minor flood level of 1.7 m AHD. The effect of the Wivenhoe release on these high tide values is estimated to be only 0.1 m. Peak levels will coincide with high tides which are expected at about 11:00 am on Wednesday 22 December and around noon on Thursday 23 December. Tide levels will be monitored over the next few days and these estimates may be adjusted in light of changed observations.

BCC had similar advice from BoM yesterday that releases plus other fresh water flows would only have 100mm impact on tides. The Flood Centre discussed with BCC yesterday and requested if they had any concerns to advise or any need to change release strategy and none received to date.

Emails have been sent to BCC, ICC and SRC this morning with similar information and requesting any assessments or concerns. If any are received they will be forwarded.

The BoM is aware of all releases.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
0410378740	0419378740

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

As above.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

BCC has been contacted by Flood Centre on ongoing basis.
Email sent to request any assessment.

BCC Technical Officer name	Chris Lavin

BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	0414 501 398

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

ICC has been contacted by Flood Centre on ongoing basis.
Email sent to request any assessment.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	0417 620 225

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

SRC has been contacted by Flood Centre on ongoing basis.
Email sent to request any assessment.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	0409627313

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	21.12.2010	**Time**	Late afternoon	**or Event**	

Barry Dennien

From: SEQWGM Media
Sent: Tuesday, 21 December 2010 10:01 AM
Subject: Media update: Dam releases
Attachments: image001.gif

21 December 2010

Media update: Dam releases

Releases from Wivenhoe Dam increased overnight and reached a peak of 110,000 megalitres earlier today.

Based on current weather forecasts, releases from Wivenhoe Dam are likely to continue through to the end of this week, however the release amount may be reduced as the dam's flood storage compartment empties.

ıe Water Grid continues to work closely with local councils regarding the likely impacts of these releases on surrounding areas which include the closure of Twin Bridges, Savages Crossing, Colleges Crossing, Burtons Crossing and Kholo Crossing.

Releases equivalent to about 35,000 megalitres per day are continuing from Somerset Dam into Wivenhoe Dam, and are expected to continue until at least tomorrow depending on forecast rainfall.

A minor release from Leslie Harrison Dam will occur today due to continuing inflows.

Gates at North Pine Dam were closed at 5am today.

Members of the public seeking information on potential impacts in their local areas should direct inquiries to their local councils.

For recorded information on current dam releases in South East Queensland, members of the public are encouraged to call **1800 613 122**.

Recreation update

Due to recent heavy rains, flood conditions exist and many dam areas can be extremely hazardous.

Somerset Dam is currently closed to all water-based recreational activities however access is expected to resume on Wednesday 22 December.

Wivenhoe Dam is also closed to all water-based recreational activities but is expected to open again later this week. The following recreation sites at Wivenhoe are currently closed:

- O'Sheas Crossing
- Sinnamon Point
- Billies Bay
- Hamon Cove
- Logan Inlet and Captain Logan Camp

Atkinson's Crossing at Wivenhoe Dam is currently open however river access is closed.

Lake Maroon is currently closed to swimming and skiing due to recent heavy rainfall however boating and fishing are still currently allowed.

For further information on the Water Grid: www.watergrid.com.au

ENDS

Notes to the editor

About the SEQ Water Grid

Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

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For further details contact the SEQ Water Grid Communications Unit on:
Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Barry Dennien

From: SEQWGM Media
Sent: Tuesday, 21 December 2010 2:10 PM
To: Barry Dennien; Michael Lyons
Cc: Shelley Banks
Subject: FW: Channel 7; Wivehoe Dam releases - media response
Attachments: image001.gif; Media response - Channel Seven_Wivenhoe Dam 21DEC1.docx

Barry and Mike

The attached media response has been approved by Seqwater. Please approve and I'll forward to Geoff Stead.

Regards
John

From: Mike Foster [mailto:mfoster@seqwater.com.au]
Sent: Tuesday, 21 December 2010 2:08 PM
To: SEQWGM Media; Paul Bird
Cc: Shelley Banks
Subject: RE: Channel 7; Wivehoe Dam releases - media response

All good

Cheers Mike

From: SEQWGM Media [mailto:media@seqwgm.com.au]
Sent: Tuesday, 21 December 2010 2:06 PM
To: Paul Bird; Mike Foster
Cc: Shelley Banks
Subject: Channel 7; Wivehoe Dam releases - media response

Hi Guys

Can you let me know if you are OK with the attached response.

Cheers

John Adcock
Stakeholder Relations Manager
SEQ Water Grid Manager
Phone: (07) 3247 3015 | Fax: (07) 3405 0373 |
Email: john.adcock@seqwgm.qld.gov.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

SEQ Water Grid

Media Response

TRIM reference: D/10/8002	**Enquiry received:** 21.12.10
Media outlet: Channel Seven	
Journalist: Geoff Breusch	
Deadline: 4pm 21 December 2010	
Email: GBreusch@seven.com.au	
Phone: 0424 779 043	

Please attribute all quotes to Barry Dennien, spokesperson for the SEQ Water Grid.

Questions

When was the last time the current rate of release from Wivenhoe (110,000 ML per day) occurred?

In mid-October 2010, 130,000 ML per day was released for several days. In 1999 there was a similar event with slightly higher release flows (155,000 ML per day).

Approved
Barry Dennien
CEO
[Insert date]

Barry Dennien

From: Barry Dennien
Sent: Tuesday, 21 December 2010 2:52 PM
To: SEQWGM Media; Michael Lyons
Cc: Shelley Banks
Subject: RE: Channel 7; Wivehoe Dam releases - media response
Attachments: image001.gif

Approved

From: SEQWGM Media
Sent: Tuesday, 21 December 2010 2:10 PM
To: Barry Dennien; Michael Lyons
Cc: Shelley Banks
Subject: FW: Channel 7; Wivehoe Dam releases - media response

Barry and Mike

The attached media response has been approved by Seqwater. Please approve and I'll forward to Geoff Stead.

Regards
John

From: Mike Foster [mailto:mfoster@seqwater.com.au]
Sent: Tuesday, 21 December 2010 2:08 PM
To: SEQWGM Media; Paul Bird
Cc: Shelley Banks
Subject: RE: Channel 7; Wivehoe Dam releases - media response

All good

Cheers Mike

From: SEQWGM Media [mailto:media@seqwgm.com.au]
Sent: Tuesday, 21 December 2010 2:06 PM
To: Paul Bird; Mike Foster
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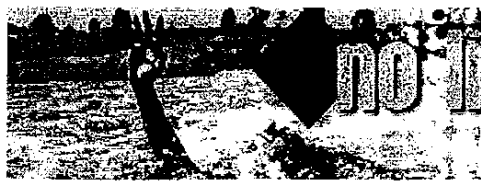
John Adcock
Stakeholder Relations Manager
SEQ Water Grid Manager
Phone: (07) 3247 3015 | Fax: (07) 3405 0373 |
Email: john.adcock@seqwgm.qld.gov.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630



Swimming in weirs and f
flowing water is FA1

Rethink

Barry Dennien

From: Tim Watts [Tim.Watts@ministerial.qld.gov.au]
Sent: Tuesday, 21 December 2010 4:15 PM
To: Dan Spiller
Cc: Lance McCallum; Barry Dennien
Subject: residents apparently not contacted before twin Bridges drowned out

Dan
As discussed the following person needs to be called re Englands Creek Road being cut by releases from Wivenhoe:

Barry Doul - 5426 7704

Please provide info about how it came to be that he was not notified that releases would increase river level and cut access.
Please also provide info about when the water is expected to recede and the system that will be put in place to ensure the 20 or so households isolated when twin bridges are drowned out are given as much notice as possible of releases from the dam.

Tim Watts
Policy Advisor
Office of the Minister for Natural Resources, Mines and Energy and Minister for Trade
Phone: (07) 3225 1797
Mobile: 0409 891 342
Fax: (07) 3225 1828

Barry Dennien

From: Dan Spiller
Sent: Tuesday, 21 December 2010 4:38 PM
To: Jade Simmons
Cc: Michael Lyons; Barry Dennien; John Adcock
Subject: FW: residents apparently not contacted before twin Bridges drowned out

Jade,

As discussed, can you please action.

Dan

-----Original Message-----
From: Tim Watts [mailto:Tim.Watts@ministerial.qld.gov.au]
Sent: Tuesday, 21 December 2010 4:15 PM
To: Dan Spiller
Cc: Lance McCallum; Barry Dennien
Subject: residents apparently not contacted before twin Bridges drowned out

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Tim

Tim Watts
Policy Advisor
Office of the Minister for Natural Resources, Mines and Energy and Minister for Trade
Phone: (07) 3225 1797
Mobile: 0409 891 342
Fax: (07) 3225 1828

From: Jade Simmons
Sent: Tuesday, 21 December 2010 4:43 PM
To: 'Mike Foster'
Cc: Dan Spiller; Michael Lyons; John Adcock
Subject: FW: URGENT - Minister Robertson - Public Enquiry - Wivenhoe Dam release, flooding in Fernvale
Importance: High

Hi Mike,

Please see the DLO request (email trail) and my summary of our telephone call below.

The Ministers Office would now also like:

- Please provide info about how it came to be that he was not notified that releases would increase river level and cut access.
- Please also provide info about when the water is expected to recede and the system that will be put in place to ensure the 20 or so households isolated when twin bridges are drowned out are given as much notice as possible of releases from the dam.

While we had until 10am tomorrow to provide response to this request, however considering the escalation, I would like to put up information this afternoon.

Barry Doul
Englands Creek Road
5426 7704

Kindest regards

Jade Simmons
Senior Correspondence Officer
SEQ Water Grid Communications Unit
SEQ Water Grid Manager
Phone: (07) 3247 4462 | Fax: (07) 3405 0373
Email: jade.simmons@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002

From: Jade Simmons
Sent: Tuesday, 21 December 2010 2:42 PM
To: 'Paul Bird'; 'Mike Foster'
Subject: FW: URGENT - Minister Robertson - Public Enquiry - Wivenhoe Dam release, flooding in Fernvale
Importance: High

Hi Mike Hi Paul,

Received this DLO request, have just spoken to him and he is very, very unhappy gentleman that would like to speak to someone about reducing the release amount so they can have access to and from their house for Christmas. He says council used to change it so they could get out, why won't we?

Have given the gentleman the 1800 number and explained that road closures are the responsibility of council. Have also stated that someone from Seqwater will contact him.

Please note the short timeframe for response and if you are to give me a few dot points, will put up in a DLO response.

Kindest regards

Jade Simmons
Senior Correspondence Officer
SEQ Water Grid Communications Unit
SEQ Water Grid Manager
Phone: (07) 3247 4462 | Fax: (07) 3405 0373
Email: jade.simmons@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002

From: Marney Jared [mailto:Jared.Marney@derm.qld.gov.au] **On Behalf Of** DLO NRMET
Sent: Tuesday, 21 December 2010 1:28 PM
To: Jade Simmons
Subject: URGENT - Minister Robertson - Public Enquiry - Wivenhoe Dam release, flooding in Fernvale
Importance: High

Jade,

The Minister's Office was contacted this morning by a Mr Barry Doole from Fernvale in relation to flooding in their area after the release of water from Wivenhoe Dam.

Could you please arrange to have an officer contact Mr Doole and assist him with his enquiry?

Please also provide a response back to me outlining the call and its outcomes by **10AM Wednesday, 22 December 2010.**

Apologies for the tight turnaround on this, however the Minister's Office has asked for all public enquiries to be responded to within 24 hours prior to Christmas leave.

Thanks,

Jared Marney
A/Senior Departmental Liaison Officer (Resource Management)
Office of the Minister for Natural Resources, Mines and Energy and Minister for Trade
Department of Environment and Resource Management

Telephone: 07 322 47077 Mobile: 0423 293 115
Email: jared.marney@derm.qld.gov.au
DLO.NRMET@derm.qld.gov.au

From: Mulder Gayle
Sent: Tuesday, 21 December 2010 9:11 AM
To: DLO NRMET
Subject: Enquiry Member of the Public
Importance: High

Phone call log MO Reception

Date Call Received	Title	First Name	Surname	Company Or Department	Address	Phone Number	Phone Message	Call From:	Allocate to:
21/12/2010	Mr	Barry	Doole	Fernvale		07 5426 7704	Mr Doole and several other families have been flooded in due to	Member of the Public	DLO NRMET

Phone call log MO Reception									
Date Call Received	Title	First Name	Surname	Company Or Department	Address	Phone Number	Phone Message	Call From	Allocate to
							the opening of the gates at Wivenhoe Dam. They went to go out xmas shopping this morning and the bridge was flooded. Mr Doole advised it they turn the volume down a notch they would be able to manage. Could someone please call him today.		

Kind Regards,

Gayle Mulder
Administration Officer
Reception / Correspondence Management Team
Department of Employment, Economic Development and Innovation
Level 17, 61 Mary Street Brisbane Qld, 4000
Telephone: 07 3006 2603
Email gayle.mulder@deedi.qld.gov.au
www.deedi.qld.gov.au

Barry Dennien

From: SEQWGM Media
Sent: Tuesday, 21 December 2010 5:05 PM
Subject: Media update - Dam releases
Attachments: image001.gif

21 December 2010 - Afternoon

Media update: Dam releases

Releases from Wivenhoe Dam increased overnight and reached a peak of 110,000 megalitres earlier today. All five spillway gates at Wivenhoe Dam have now been opened to release this volume.

Based on current weather forecasts, releases from Wivenhoe Dam are likely to continue through to the end of this week, however the release amount may be reduced as the dam's flood storage compartment empties.

The Water Grid continues to work closely with local councils regarding the likely impacts of these releases on surrounding areas which include the closure of Twin Bridges, Savages Crossing, Colleges Crossing, Burtons Crossing and Kholo Crossing.

Releases equivalent to about 35,000 megalitres per day are continuing from Somerset Dam into Wivenhoe Dam, and are expected to continue until at least tomorrow depending on forecast rainfall.

A minor release from Leslie Harrison Dam occurred today due to continuing inflows, which will close at approximately 4.30 pm.

Gates at North Pine Dam were closed at 5am today.

Members of the public seeking information on potential impacts in their local areas should direct inquiries to their local councils.

For recorded information on current dam releases in South East Queensland, members of the public are encouraged to call **1800 613 122**.

Recreation update

Due to recent heavy rains, flood conditions exist and many dam areas can be extremely hazardous.

Somerset Dam is currently closed to all water-based recreational activities however access is expected to resume on Wednesday 22 December.

Wivenhoe Dam is also closed to all water-based recreational activities but is expected to open again later this week. The following recreation sites at Wivenhoe are currently closed:

- O'Sheas Crossing
- Sinnamon Point
- Billies Bay
- Hamon Cove
- Logan Inlet and Captain Logan Camp

Atkinson's Crossing at Wivenhoe Dam is currently open however river access is closed.

Lake Maroon is currently closed to swimming and skiing due to recent heavy rainfall however boating and fishing are still currently allowed.

For further information on the Water Grid: www.watergrid.com.au

ENDS

Notes to the editor

About the SEQ Water Grid

Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further details contact the SEQ Water Grid Communications Unit on:
Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Barry Dennien

From: Jade Simmons
Sent: Tuesday, 21 December 2010 5:14 PM
To: mfoster@seqwater.com.au
Cc: Michael Lyons; Dan Spiller; Barry Dennien
Subject: FW: URGENT - Minister Robertson - Public Enquiry - Wivenhoe Dam release, flooding in Fernvale

Importance: High

HI Mike,

Just spoke to Ministers Office, while it would be best that someone calls this constituent tonight, Ministers Office are happy to receive the information tomorrow, as per the original response time.

Kindest regards

Jade Simmons
Senior Correspondence Officer
SEQ Water Grid Communications Unit
SEQ Water Grid Manager
Phone: (07) 3247 4462 | Fax: (07) 3405 0373
Email: jade.simmons@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002

From: Jade Simmons
Sent: Tuesday, 21 December 2010 4:43 PM
To: 'Mike Foster'
Cc: Dan Spiller; Michael Lyons; John Adcock
Subject: FW: URGENT - Minister Robertson - Public Enquiry - Wivenhoe Dam release, flooding in Fernvale
Importance: High

Hi Mike,

Please see the DLO request (email trail) and my summary of our telephone call below.

The Ministers Office would now also like:

- Please provide info about how it came to be that he was not notified that releases would increase river level and cut access.
- Please also provide info about when the water is expected to recede and the system that will be put in place to ensure the 20 or so households isolated when twin bridges are drowned out are given as much notice as possible of releases from the dam.

While we had until 10am tomorrow to provide response to this request, however considering the escalation, I would like to put up information this afternoon.

Barry Doul
Englands Creek Road
5426 7704

Kindest regards

Jade Simmons
Senior Correspondence Officer
SEQ Water Grid Communications Unit
SEQ Water Grid Manager
Phone: (07) 3247 4462 | Fax: (07) 3405 0373
Email: jade.simmons@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002

From: Jade Simmons
Sent: Tuesday, 21 December 2010 2:42 PM
To: 'Paul Bird'; 'Mike Foster'
Subject: FW: URGENT - Minister Robertson - Public Enquiry - Wivenhoe Dam release, flooding in Fernvale
Importance: High

Hi Mike Hi Paul,

Received this DLO request, have just spoken to him and he is very, very unhappy gentleman that would like to speak to someone about reducing the release amount so they can have access to and from their house for Christmas. He says council used to change it so they could get out, why won't we?

Have given the gentleman the 1800 number and explained that road closures are the responsibility of council. Have also stated that someone from Seqwater will contact him.

Please note the short timeframe for response and if you are to give me a few dot points, will put up in a DLO response.

Kindest regards

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Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002

From: Marney Jared [mailto:Jared.Marney@derm.qld.gov.au] **On Behalf Of** DLO NRMET
Sent: Tuesday, 21 December 2010 1:28 PM
To: Jade Simmons
Subject: URGENT - Minister Robertson - Public Enquiry - Wivenhoe Dam release, flooding in Fernvale
Importance: High

Hi Jade,

The Minister's Office was contacted this morning by a Mr Barry Doole from Fernvale in relation to flooding in their area after the release of water from Wivenhoe Dam.

Could you please arrange to have an officer contact Mr Doole and assist him with his enquiry?

Please also provide a response back to me outlining the call and its outcomes by **10AM Wednesday, 22 December 2010.**

Apologies for the tight turnaround on this, however the Minister's Office has asked for all public enquiries to be responded to within 24 hours prior to Christmas leave.

Thanks,

Jared Marney
A/Senior Departmental Liaison Officer (Resource Management)
Office of the Minister for Natural Resources, Mines and Energy and Minister for Trade
Department of Environment and Resource Management

Telephone: 07 322 47077 Mobile: 0423 293 115
Email: jared.marney@derm.qld.gov.au
DLO.NRMET@derm.qld.gov.au

From: Mulder Gayle
Sent: Tuesday, 21 December 2010 9:11 AM
To: DLO NRMET
Subject: Enquiry Member of the Public
Importance: High

Phone call log MO Reception

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Kind Regards,

Gayle Mulder
Administration Officer
Reception / Correspondence Management Team
Department of Employment, Economic Development and Innovation
Level 17, 61 Mary Street Brisbane Qld, 4000
Telephone: 07 3006 2603
Email gayle.mulder@deedi.qld.gov.au
www.deedi.qld.gov.au

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+----------+

Barry Dennien

From: Jade Simmons
Sent: Wednesday, 22 December 2010 8:20 AM
To: Dan Spiller; John Adcock
Cc: Barry Dennien; Michael Lyons
Subject: FW: URGENT - Minister Robertson - Public Enquiry - Wivenhoe Dam release, flooding in Fernvale

Morning Dan and John,

Please see below the summary from Seqwater in relation to Mr Barry Doole, in particular, that Somerset Council believed they had contacted all residents.

Kindest regards

Jade Simmons
Senior Correspondence Officer
SEQ Water Grid Communications Unit
SEQ Water Grid Manager
Phone: (07) 3247 4462 | Fax: (07) 3405 0373
Email: jade.simmons@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002

From: Mike Foster [mailto:mfoster@seqwater.com.au]
Sent: Tuesday, 21 December 2010 5:26 PM
To: Jade Simmons
Subject: RE: URGENT - Minister Robertson - Public Enquiry - Wivenhoe Dam release, flooding in Fernvale

Jade,

Seqwater Operations Manager Rob Drury has called and left a message and will call again later tonight if his call is not returned.

We have also spoken to Somerset Council who were aware of the likelihood of England's Creek Rd flooding. Council advised they believed they had contacted ALL residents.

Suggest the Grid comms contact Somerset tomorrow with the details to ensure Mr Doul is on their contact list for the area.

Cheers Mike

From: Jade Simmons [mailto:Jade.Simmons@seqwgm.com.au]
Sent: Tuesday, 21 December 2010 5:14 PM
To: Mike Foster
Cc: Michael Lyons; Dan Spiller; Barry Dennien
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SEQ Water Grid Manager
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Importance: High

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- Please also provide info about when the water is expected to recede and the system that will be put in place to ensure the 20 or so households isolated when twin bridges are drowned out are given as much notice as possible of releases from the dam.

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Barry Doul
Englands Creek Road
5426 7704

Kindest regards

Jade Simmons
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SEQ Water Grid Communications Unit
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Phone: (07) 3247 4462 | Fax: (07) 3405 0373
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To: 'Paul Bird'; 'Mike Foster'
Subject: FW: URGENT - Minister Robertson - Public Enquiry - Wivenhoe Dam release, flooding in Fernvale
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Hi Mike Hi Paul,

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Have given the gentleman the 1800 number and explained that road closures are the responsibility of council. Have also stated that someone from Seqwater will contact him.

Please note the short timeframe for response and if you are to give me a few dot points, will put up in a DLO response.

Kindest regards

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SEQ Water Grid Communications Unit
SEQ Water Grid Manager
Phone: (07) 3247 4462 | Fax: (07) 3405 0373
Email: jade.simmons@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002

From: Marney Jared [mailto:Jared.Marney@derm.qld.gov.au] **On Behalf Of** DLO NRMET
Sent: Tuesday, 21 December 2010 1:28 PM
To: Jade Simmons
Subject: URGENT - Minister Robertson - Public Enquiry - Wivenhoe Dam release, flooding in Fernvale
Importance: High

Hi Jade,

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Could you please arrange to have an officer contact Mr Doole and assist him with his enquiry?

Please also provide a response back to me outlining the call and its outcomes by **10AM Wednesday, 22 December 2010.**

Apologies for the tight turnaround on this, however the Minister's Office has asked for all public enquiries to be responded to within 24 hours prior to Christmas leave.

Thanks,

Jared Marney
A/Senior Departmental Liaison Officer (Resource Management)
Office of the Minister for Natural Resources, Mines and Energy and Minister for Trade
Department of Environment and Resource Management

Telephone: 07 322 47077 Mobile: 0423 293 115
Email: jared.marney@derm.qld.gov.au
DLO.NRMET@derm.qld.gov.au

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Kind Regards,

Gayle Mulder
Administration Officer
Reception / Correspondence Management Team
Department of Employment, Economic Development and Innovation
Level 17, 61 Mary Street Brisbane Qld, 4000
Telephone: 07 3006 2603
Email gayle.mulder@deedi.qld.gov.au
www.deedi.qld.gov.au

Barry Dennien

From: Dan Spiller
Sent: Wednesday, 22 December 2010 9:15 AM
To: Michael Lyons; Barry Dennien
Subject: Fwd: Technical Report W14
Attachments: Seqwater_No-Lifeguards-Here_email_strap.png; ATT00001.htm; cidimage001.png@01CA24E1.BDB90020; ATT00002.htm; Technical Stuation Report W14.docx; ATT00003.htm

Begin forwarded message:

From: Rob Drury <rdrury@seqwater.com.au>
Date: 22 December 2010 8:37:36 AM GMT+10:00
To: Dan Spiller <Daniel.Spiller@seqwgm.com.au>
Cc: David Roberts <droberts@seqwater.com.au>, Peter Borrows <pborrows@seqwater.com.au>, Jim Pruss <jpruss@seqwater.com.au>, Mike Foster <mfoster@seqwater.com.au>, Alex Fisher <afisher@seqwater.com.au>, Helen Moore <hmoore@seqwater.com.au>, Bill Andrew <bandrew@seqwater.com.au>
Subject: Technical Report W14

Attached Report W14.

Rob

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater

Ph (07) 54278131 | Fax (07) 54261097 | M 0419378740 | E rdrury@seqwater.com.au

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306

Website | www.seqwater.com.au

TECHNICAL SITUATION REPORT

TSR Number	W14	Date of TSR release	22.12.2010	Time of TSR release	8.30am

Seqwater status of inflows and dam operations

Somerset/Wivenhoe Dams

Rainfall

No rainfall has occurred over the catchment of the dams since 03:00 on Monday 20 December 2010. All major streams have now peaked and inflows are receding.

Wednesday 22 December Rain developing
Thursday 23 December Rain easing to showers
Friday 24 December Showers tending to rain at times
Saturday 25 December Showers tending to rain at times
Sunday 26 December Rain increasing
Monday 27 December Rain at times
Tuesday 28 December Rain at times

Somerset Dam

Gate operations are occurring at Somerset Dam and are expected to continue until at least Wednesday 22 December 2010 assuming no further rainfall. Two sluice gates are currently releasing about 410 m3/s from the dam into Lake Wivenhoe.

Somerset Dam peaked at EL 100.43 m AHD at around 13:00 on Monday 20 December 2010 and the lake level is slowly falling. Somerset Dam is currently at EL 99.68 m AHD, (108 % of capacity).

The estimated inflow into Somerset Dam to date is 121,500ML, of which 103,000 ML has been discharged into Wivenhoe Dam.

Continued gate operations may be necessary if forecast rainfall from Wednesday to Monday results in subsequent river rises.

Wivenhoe Dam

Gate operations are occurring at Wivenhoe Dam and are expected to continue until Thursday 23 December 2010 assuming no further rainfall. Releases from the dam were increased slightly late yesterday as other river flows dropped and have been steady at a maximum release rate of about 1,440 m3/s since 18:00 Tuesday 21/12/2010. This flow rate will be maintained until early Thursday 23 December 2010, when releases will be reduced as the flood storage compartment is emptied.

Wivenhoe Dam peaked at a level of EL 68.24 m AHD at approximately 04:00 on Tuesday 21/12/2010. The current level is EL 67.71 m AHD (107% of capacity) and falling slowly.

The estimated inflow into Wivenhoe Dam to date (excluding releases from Somerset Dam) is 181,000 ML, of which 221,500 ML has been released. The total estimated inflow into both dams for this event, based upon rainfall to date is 310,000 ML.

Continued gate operations may be necessary if forecast rainfall from Wednesday to Monday results in subsequent river rises.

Impacts of Releases

The increased release from Wivenhoe Dam has resulted in elevated levels in the Brisbane River from Wivenhoe to Colleges Crossing. Twin Bridges, Savages Crossing and Colleges Crossing were inundated earlier in the event. As a consequence of the increased release from Wivenhoe Dam, Burtons Bridge was inundated at around 00:40 on Tuesday 21 December 2010. Kholo Bridge was inundated around midday Tuesday 21 December 2010. In accordance with the adopted operational strategy these bridges should be back in service by late Thursday or Friday and all bridges (with the exception of Twin Bridges) should be trafficable for Christmas providing no further rainfall occurs. No future rainfall is currently included in these forecasts.

Advice from the BoM regarding predicted tides in the Brisbane River at the City Gauge, suggest that peak levels (1.7 to 1.8 m AHD) may reach or slightly exceed the minor flood level of 1.7 m AHD. The effect of the Wivenhoe release on these high tide values is estimated to be about 0.1m. Peak levels will coincide with high tides which are expected at about 11:00 am on Wednesday 22 December and around noon on Thursday 23 December. Tide levels will be monitored over the next few days and these estimates may be adjusted by BoM in light of changed observations. It is anticipated that this advice will be updated sometime today but no significant change to this advice is expected.

Emails have been sent to BCC, ICC and SRC this morning with similar information and requesting any assessments or concerns. If any are received they will be forwarded.

The BoM is aware of all releases.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
0410378740	0419378740

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

As above.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

BCC has been contacted by Flood Centre on ongoing basis.
Email sent to request any assessment.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	0414 501 398

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

ICC has been contacted by Flood Centre on ongoing basis.
Email sent to request any assessment.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	0417 620 225

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

SRC has been contacted by Flood Centre on ongoing basis.
Email sent to request any assessment.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	0409627313

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**		**Time**		**or Event**	Closing strategy

Barry Dennien

From: Jade Simmons
Sent: Wednesday, 22 December 2010 9:18 AM
To: Barry Dennien
Cc: Michael Lyons; John Adcock
Subject: FW: URGENT - Minister Robertson - Public Enquiry - Wivenhoe Dam release, flooding in Fernvale

HI Barry,

As discussed, please see below the email trail from yesterday and today, in relation to Mr Barry Doole and the request from Ministers Office to contact him.

Kindest regards

Jade Simmons
Senior Correspondence Officer
SEQ Water Grid Communications Unit
SEQ Water Grid Manager
Phone: (07) 3247 4462 | Fax: (07) 3405 0373
Email: jade.simmons@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002

From: Mike Foster [mailto:mfoster@seqwater.com.au]
Sent: Wednesday, 22 December 2010 8:32 AM
To: Jade Simmons
Subject: RE: URGENT - Minister Robertson - Public Enquiry - Wivenhoe Dam release, flooding in Fernvale

Thanks Jade

Our Operations Manager Rob Drury spoke to Mr Doul for about 30 minutes last night.

While he has a better understanding of our release requirements he remains unhappy that he wasn't notified and that the release is occurring.

As per below Seqwater spoke to the Somerset Regional Council and they have advised they will be speaking with Mr Doul today. As per below the Council believed that had spoken to ALL residents England's Creek Rd prior to the release.

Cheers Mike

From: Jade Simmons [mailto:Jade.Simmons@seqwgm.com.au]
Sent: Wednesday, 22 December 2010 8:28 AM
To: Mike Foster
Subject: RE: URGENT - Minister Robertson - Public Enquiry - Wivenhoe Dam release, flooding in Fernvale

Thanks Mike,

Would you be able to send through a summary of the telephone call if Rob managed to get hold of him please? We will also contact council and I will cc you in on the response to Ministers Office.

Kindest regards

Jade Simmons
Senior Correspondence Officer
SEQ Water Grid Communications Unit
SEQ Water Grid Manager
Phone: (07) 3247 4462 | Fax: (07) 3405 0373
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Jade,

Seqwater Operations Manager Rob Drury has called and left a message and will call again later tonight if his call is not returned.

We have also spoken to Somerset Council who were aware of the likelihood of England's Creek Rd flooding. Council advised they believed they had contacted ALL residents.

Suggest the Grid comms contact Somerset tomorrow with the details to ensure Mr Doul is on their contact list for the area.

Cheers Mike

From: Jade Simmons [mailto:Jade.Simmons@seqwgm.com.au]
Sent: Tuesday, 21 December 2010 5:14 PM
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Cc: Michael Lyons; Dan Spiller; Barry Dennien
Subject: FW: URGENT - Minister Robertson - Public Enquiry - Wivenhoe Dam release, flooding in Fernvale
Importance: High

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Email: jade.simmons@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002

Barry Dennien

From: Reilly Bob [Bob.Reilly@derm.qld.gov.au]
Sent: Wednesday, 22 December 2010 9:27 AM
To: pborrows@seqwater.com.au
Cc: Barry Dennien; Michael Lyons; rdrury@seqwater.com.au; Best Debbie
Subject: Wivenhoe floodwater releases: impacts on access arrangements for people

Hi Peter

The nature of the flood releases is such that a certain number of low level crossings are submerged for a longer period of time, than would be the case in the absence of the releases.

For many of the people whose access may be affected by the floodwater releases, alternative (albeit with longer travel times) access arrangements, are available.

However, are their people who do not have alternative access arrangements? If so, roughly how many, and in what locations? Has Council/Seqwater provided them with some support arrangements to deal with these access issues?

The reason I ask is that is one thing to ask for such people to be inconvenienced (in the absence of some support arrangements) for a few days once every 5 to 10 years, but it is another matter if these events occur on a monthly (or more frequent basis) basis—as may well happen over the next few months.

If you could give me a ring to discuss the matter later this week, then that would be appreciated.

Thanks

Bob

Bob Reilly

General Manager, Office of the Water Supply Regulator

Telephone: 07 3224 2898 **Mobile:** 0408 985 852 **Facsimile:** 07 3224 7999

Email: bob.reilly@derm.qld.gov.au

www.derm.qld.gov.au

Department of Environment and Resource Management

Lvl 3 41 George Street, Brisbane Q 4000

GPO Box 2454, Brisbane Q 4001

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

Barry Dennien

From: Shelley Banks
Sent: Wednesday, 22 December 2010 9:33 AM
To: Barry Dennien
Subject: FW: Morning Update
Attachments: image001.jpg; image002.png; image003.gif

Importance: High

Recreation update below.

Shelley Banks
Senior Communications Officer
SEQ Water Grid Communications Unit
SEQ Water Grid Manager
Phone: (07) 3247 3014 | Fax: (07) 3405 0373
Email: shelley.banks@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

From: Tara King [mailto:tking@seqwater.com.au]
Sent: Wednesday, 22 December 2010 8:06 AM
To: SEQWGM Media; aroebuck@ipswich.qld.gov.au; greg.swain@brisbane.qld.gov.au; GSTUBBS@goldcoast.qld.gov.au; lisa.m.martin@brisbane.qld.gov.au; tjacobs@somerset.qld.gov.au
Cc: Mike Foster; Michael Lyons; Reception; Arminda Roberts; Michael Fiechtner; Bill Andrew; Peter Borrows; Jim Pruss
Subject: Morning Update
Importance: High

AS AT 8AM WEDNSDAY 22 DECEMBER THE FOLLOWING WATER RELEASES ARE BEING MADE:

WIVENHOE DAM:
RELEASES HAVE CONTINUED OVERNIGHT, WITH GATED OPERATIONS EXPECTED TO CONTINUE UNTIL THURSDAY OR FRIDAY, ASSUMING NO FURTHER RAINFALL.
THE CURRENT RELEASE FLOW RATE WILL BE MAINTAINED UNTIL THURSDAY 23 DECEMBER, WHEN RELEASES ARE EXPECTED TO REDUCE AS THE FLOOD STORAGE COMPARTMENT EMPTIES.

CONTINUED GATE OPERATIONS MAY BE NECESSARY IF FORECAST RAINFALL FROM WEDNESDAY TO MONDAY RESULTS IN SUBSEQUENT RIVER RISES.

LOCAL COUNCILS HAVE BEEN CONSULTED AND THE RELEASE WILL RESULT IN THE CLOSURE OF:
TWIN BRIDGES,
SAVAGES CROSSING
COLLEGES CROSSING
BURTONS CROSSING
KHOLO CROSSING

SOMERSET DAM:

RELEASES OF ABOUT 35,000 MEGALITRES ARE BEING MADE FROM SOMERSET DAM VIA SLUICE GATES INTO WIVENHOE DAM. RELEASES ARE EXPECTED TO CONTINUE UNTIL WEDNESDAY 22 DECEMBER BUT MAY CONTINUE PAST THIS DATE IF FORECAST RAINFALL RESULTS IN SUBSEQUENT RIVER RISES.

NORTH PINE DAM:
NORTH PINE GATES WERE CLOSED AT 5.00 AM TUESDAY 21 DECEMBER.

LESLIE HARRISON DAM:
LESLIE HARRISON GATES WERE CLOSED AT 4.00 PM TUESDAY 21 DECEMBER.

HINZE DAM:
NO RELEASES

FOR DETAILED INFORMATION ON ROAD CROSSING CLOSURES AND OTHER POTENTIAL IMPACTS, ALWAYS CONTACT YOUR LOCAL COUNCIL

RECREATION UPDATE:
LAKE SOMERSET HAS BEEN REOPENED TO WATER-BASED RECREATIONAL ACTIVITIES.

'IVENHOE STILL HAS SOME INFRASTRUCTURE SUBMERGED AT PARTICULAR SITES, HOWEVER LAKE WIVENHOE HAS REOPENED TO WATER-BASED RECREATIONAL ACTIVITIES. THE FOLLOWING RECREATIONAL SITES REMAIN CLOSED, HOWEVER IT IS EXPECTED THEY MAY REOPEN TOMORROW.

- HAMON COVE
- CAPTAIN LOGAN CAMP
- RIVER ACCESS AT ATKINSON'S CROSSING
- BILLIES BAY.

ALL OTHER RECREATIONAL SITES HAVE REOPENED. IF FORECAST RAINFALL EVENTUATES, THIS MAY AFFECT RECREATIONAL ACTIVITIES.

DUE TO RECENT RAINFALL EVENTS, LAKE MAROON HAS BEEN CLOSED TO SWIMMING AND SKIING AS A PRECAUTION UNTIL FURTHER NOTICE. BOATING AND FISHING ARE STILL ALLOWED.

PLEASE NOTE: CONDITIONS WILL BE EXTREMELY DANGEROUS, WITH THE RAIN HAVING CLEARED, FLOOD CONDITIONS STILL EXIST. MORE RAIN IS FORECAST FOR THE COMING WEEK, WHICH MAY IMPACT ON RECREATIONAL AND WATER RELEASE ACTIVITIES.

THIS INFORMATION WILL BE UPDATED DURING THE AFTERNOON OF 22 DECEMBER OR IF ANY SIGNIFICANT CHANGES OCCUR.

TARA KING
Communications Advisor
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

Ph (07) 3035 5563 | Fax (07) 3229 7926 | E tking@seqwater.com.au
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

Barry Dennien

From: SEQWGM Media
Sent: Wednesday, 22 December 2010 10:47 AM
Subject: Media update - Dam releases

22 December 2010 - Morning

Media update: Dam releases

Releases from Wivenhoe Dam continued overnight with all five spillway gates at Wivenhoe Dam opened.

The current release volume of 110,000 megalitres will be maintained until Thursday 23 December 2010, when releases are expected to reduce as the flood storage compartment empties.

Continued gate operations are being assessed depending on whether the forecasted level of rainfall and inflows is received over the Christmas period.

The Water Grid continues to work closely with local councils regarding the likely impacts of these releases on surrounding areas which include the closure of Twin Bridges, Savages Crossing, Colleges Crossing, Burtons Crossing and Kholo Crossing.

Releases equivalent to about 35,000 megalitres per day are continuing from Somerset Dam into Wivenhoe Dam, and are expected to continue depending on forecast rainfall.

The gates at Leslie Harrison Dam closed at 4.00pm yesterday, after a minor release was made.

Members of the public seeking information on potential impacts in their local areas should direct inquiries to their local councils.

For recorded information on current dam releases in South East Queensland, members of the public are encouraged to call **1800 613 122**.

Recreation update

While every effort will be made to keep recreational sites open, public safety is paramount and it is possible that some sites may be closed at short notice due to heavy weather.

Therefore, members of the public who are considering recreational activities including camping at South East Queensland dams over the Christmas/New Year period are urged to explore other options – have a plan B.

Currently, Somerset Dam has been re-opened for all water-based recreational activities, however this may change.

Likewise, Wivenhoe Dam has also been re-opened for all water-based recreational activities, however the following recreation sites at Wivenhoe remain closed:

- Hamon Cove
- Captain Logan Camp
- Billies Bay

Atkinson's Crossing at Wivenhoe Dam is currently open however river access is closed.

Lake Maroon is currently closed to swimming and skiing due to recent heavy rainfall however boating and fishing are still currently allowed.

For further information on the Water Grid: www.watergrid.com.au

ENDS

Notes to the editor

About the SEQ Water Grid

Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further details contact the SEQ Water Grid Communications Unit on:
Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Jade Simmons
Senior Correspondence Officer
SEQ Water Grid Communications Unit
SEQ Water Grid Manager
Phone: (07) 3247 4462 | Fax: (07) 3405 0373
Email: jade.simmons@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002

Barry Dennien

From: Ken Smith [Ken.Smith@premiers.qld.gov.au]
Sent: Wednesday, 22 December 2010 12:53 PM
To: John Bradley (JOhn.Bradley@derm.qld.gov.au); Barry Dennien
Subject: FW: Brisbane residents sandbagging against localised floods

John and Barry

Some very localised flooding. What are the current release levels from Wivenhoe?

Regards

Ken Smith
Director-General
Department of the Premier and Cabinet

Phone: 07 322 44728 Fax: 3229 2049
Mobile: 0417 730 013
Email: Ken.Smith@premiers.qld.gov.au

Tomorrow's Queensland: strong, green, smart, healthy and fair - www.towardQ2.qld.gov.au

Please consider the environment before printing this email (3 sheets of paper = 1 litre of water)

From: Kimberley Gardiner [mailto:Kimberley.Gardiner@ministerial.qld.gov.au]
Sent: Wednesday, 22 December 2010 12:41 PM
To: Anna Bligh; Premiers Office - Media Unit; Stephen Beckett; Melissa Patch; Adam Shortman
Cc: Ken Smith
Subject: Brisbane residents sandbagging against localised floods

Brisbane residents sandbagging against localised floods

By Stephanie Smail ABC News

Posted 11 minutes ago

- Map: Brisbane 4000

Tidal flooding has inundated some suburbs along the Brisbane River this morning.

Days of heavy rain, storm run-off and releases from the Wivenhoe Dam, north of Ipswich, have raised river levels.

There is minor flooding in suburbs including Windsor, Albion and Newstead.

The Brisbane City Council says some sandbagging is underway but the water levels are already dropping.

Kimberley Gardiner
Director, Government Media Unit
Office of the Premier of Queensland
P 07 3225 1610
M 0457 808 559
E kimberley.gardiner@ministerial.qld.gov.au

Barry Dennien

From: Barry Dennien
Sent: Wednesday, 22 December 2010 1:13 PM
To: 'Ken Smith'; John Bradley (JOhn.Bradley@derm.qld.gov.au)
Cc: Dan Spiller
Subject: RE: Brisbane residents sandbagging against localised floods

Ken

Current release rate is 110,000 megalitres per day (1300 cubic meters per second) October releases were at a maximum of 1500 cubic meters per second. These are expected to continue until tomorrow and then cut back over the xmas break. However the variable in all of this is the rain forecast. Wivenhoe is at 106% and we are targeting 100% by tomorrow allowing for inflows still coming .

The forecast could change in the coming days with the low forming off the Mid East Coast of Queensland, getting the dam back to 100% is critical in case the rain event escalates.

The tide peaked today at 1.85m and tomorrow and Friday will peak slightly higher than at 1.95m this is higher than October 1.66m peak. Then the tides will start to decrease.

We remain in close communication with the BOM and BCC. The protocol is being followed.

Regards

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Barry Dennien

From: Ken Smith [Ken.Smith@premiers.qld.gov.au]
Sent: Wednesday, 22 December 2010 1:25 PM
To: Barry Dennien; John Bradley (JOhn.Bradley@derm.qld.gov.au)
Cc: Dan Spiller; 'Jim McGowan'; 'Bruce Grady'
Subject: RE: Brisbane residents sandbagging against localised floods

Thanks Barry. We are getting further advice from the Bureau on Friday at our SDMG meeting which John or his rep will attend.

Jim/ Bruce ...what are the impacts of the higher tide peak on Friday? 1.85 to 1.95?

Regards

Ken Smith
Director-General
Department of the Premier and Cabinet

Phone: 07 322 44728 Fax: 3229 2049
Mobile: 0417 730 013
Email: Ken.Smith@premiers.qld.gov.au

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Kimberley Gardiner
Director, Government Media Unit
Office of the Premier of Queensland
P 07 3225 1610
M 0457 808 559
E kimberley.gardiner@ministerial.qld.gov.au

Gina O'Driscoll

From: Bradley John [John.Bradley@derm.qld.gov.au]
Sent: Wednesday, 22 December 2010 1:35 PM
To: Armstrong Steve
Cc: Dan Spiller; Brown Damien; Leverington Andrea; Wall Terry; Barry Dennien; Best Debbie; Ellwood Dean
Subject: RE: Brisbane residents sandbagging against localised floods

Steve

Can you pls pull together **for 4.00 or 5.00pm tomorrow** a DERM portfolio SITREP discussion in advance of SDMG on Friday to run through latest on key issues.

We will need attendees at least as above....

My starting point for agenda is below but happy for others to add to it.

- Mines Preparation **(Terry/Damien)**
  - CQ Mines - TEP approvals etc
  - NW Mines - Current Status / Imminent Risks (Gulf System, etc)
- SEQ Flood Risk Management **(Barry/Dan)**
  - (Dam releases etc)
- Other regional Dam release issues (if any worth discussing, if not remove) - **Terry / OWSR**
- QPWS preparation **(Andrea)**

Intent would be to get a one pager or key SITREPs on each topic. Key focus should be on

- Current Status/Risk
- Incident management readiness
- Resource Availability and On Call arrangements if needed – eg. processing permits/approvals.

thanks alot

John Bradley
Director-General
Department of Environment and Resource Management
Telephone: 07 3330 6298
Email: John.Bradley@derm.qld.gov.au
www.derm.qld.gov.au

Department of Environment and Resource Management
400 George Street, Brisbane Q 4000
GPO Box 2454, Brisbane Q 4001

From: Barry Dennien [mailto:Barry.Dennien@seqwgm.com.au]
Sent: Wednesday, 22 December 2010 1:13 PM
To: Ken Smith; Bradley John
Cc: spiller daniel @ SEQWGM
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E kimberley.gardiner@ministerial.qld.gov.au

Barry Dennien

From: SEQWGM Media
Sent: Wednesday, 22 December 2010 1:58 PM
To: Geoff Stead
Cc: SEQWGM Communications Staff; Dan Spiller; Barry Dennien; Mike Foster; pbird@seqwater.com.au; Michael Lyons
Subject: Approved advertising script and text
Attachments: image001.gif

Hi Geoff

Please see below the text and script for the advertisements to run over the next week, highlighting safety messages around Water Grid recreation sites.

Approved text for print ads:
(Courier Mail, Queensland Times, Sunshine Coast Daily, Gold Coast Bulletin)

WATER GRID COMMUNITY SERVICE ANNOUNCEMENT

Wet weather means that water releases from dams across the region are likely to continue this holiday season.

For daily information on dam releases in South East Queensland, contact 1800 613 122.

While every effort will be made to keep recreational sites open, public safety is paramount and it is possible that some sites may be closed at short notice due to heavy weather.

The Water Grid is urging campers at South East Queensland dams to consider a plan B this holiday season.

For more information on the status of dam levels and Water Grid recreation sites visit www.watergrid.com.au

For information on local flooding, including road closures, contact the local council or visit their website.

The council areas that are affected by Wivenhoe Dam releases are:

- Somerset Regional Council; 5424 4000; www.somerset.qld.gov.au
- Ipswich City Council; 3810 6666; www.ipswich.qld.gov.au
- Brisbane City Council; 3403 8888; www.brisbane.qld.gov.au

Approved script for radio ads:
(B105, Triple M, River FM, 4BC)

Wet weather means that water releases from dams across South East Queensland are likely to continue this holiday season.

To find out the latest information on dam releases call 1800 613 122.

The Water Grid is making every effort to keep recreational sites open, but public safety is paramount. Some sites may need to be closed at short notice. Visit www.watergrid.com.au for the latest information.

For information on local flooding, including road closures, contact the local council or visit their website.

Aleisha Coote
Senior Media Advisor
SEQ Water Grid Communications Unit
Phone: (07) 3224 7212 | Fax: (07) 3405 0373
Email: aleisha.coote@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Barry Dennien

From: Barry Dennien
Sent: Wednesday, 22 December 2010 2:03 PM
To: John Bradley (JOhn.Bradley@derm.qld.gov.au); 'Ken Smith'
Cc: Michael Lyons; Dan Spiller
Subject: FW: Media update - Dam releases
Attachments: Technical Stuation Report W14.docx

Ken John

We will keep you updated on our press releases from now on.

Also see attached this morning's "Technical Situation Report"

This report is a key step in the Premier's flood release protocol.

Dan Spiller will shortly send through some advertising we are planning over the coming days with regards flood releases and Dam recreation.

I will send through a fact sheet on Wivenhoe Flood Management in the next few hours after it comes back from the editor.

Regards

Barry

From: SEQWGM Media
Sent: Wednesday, 22 December 2010 10:47 AM
Subject: Media update - Dam releases

22 December 2010 - Morning

Media update: Dam releases

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The gates at Leslie Harrison Dam closed at 4.00pm yesterday, after a minor release was made.

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Currently, Somerset Dam has been re-opened for all water-based recreational activities, however this may change.

Likewise, Wivenhoe Dam has also been re-opened for all water-based recreational activities, however the following recreation sites at Wivenhoe remain closed:

- Hamon Cove
- Captain Logan Camp
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TECHNICAL SITUATION REPORT

TSR Number	W14	Date of TSR release	22.12.2010	Time of TSR release	8.30am

Seqwater status of inflows and dam operations

Somerset/Wivenhoe Dams

Rainfall

No rainfall has occurred over the catchment of the dams since 03:00 on Monday 20 December 2010. All major streams have now peaked and inflows are receding.

Wednesday 22 December Rain developing
Thursday 23 December Rain easing to showers
Friday 24 December Showers tending to rain at times
Saturday 25 December Showers tending to rain at times
Sunday 26 December Rain increasing
Monday 27 December Rain at times
Tuesday 28 December Rain at times

Somerset Dam

Gate operations are occurring at Somerset Dam and are expected to continue until at least Wednesday 22 December 2010 assuming no further rainfall. Two sluice gates are currently releasing about 410 m3/s from the dam into Lake Wivenhoe.

Somerset Dam peaked at EL 100.43 m AHD at around 13:00 on Monday 20 December 2010 and the lake level is slowly falling. Somerset Dam is currently at EL 99.68 m AHD, (108 % of capacity).

The estimated inflow into Somerset Dam to date is 121,500ML, of which 103,000 ML has been discharged into Wivenhoe Dam.

Continued gate operations may be necessary if forecast rainfall from Wednesday to Monday results in subsequent river rises.

Wivenhoe Dam

Gate operations are occurring at Wivenhoe Dam and are expected to continue until Thursday 23 December 2010 assuming no further rainfall. Releases from the dam were increased slightly late yesterday as other river flows dropped and have been steady at a maximum release rate of about 1,440 m3/s since 18:00 Tuesday 21/12/2010. This flow rate will be maintained until early Thursday 23 December 2010, when releases will be reduced as the flood storage compartment is emptied.

Wivenhoe Dam peaked at a level of EL 68.24 m AHD at approximately 04:00 on Tuesday 21/12/2010. The current level is EL 67.71 m AHD (107% of capacity) and falling slowly.

The estimated inflow into Wivenhoe Dam to date (excluding releases from Somerset Dam) is 181,000 ML, of which 221,500 ML has been released. The total estimated inflow into both dams for this event, based upon rainfall to date is 310,000 ML.

Continued gate operations may be necessary if forecast rainfall from Wednesday to Monday results in subsequent river rises.

Impacts of Releases

The increased release from Wivenhoe Dam has resulted in elevated levels in the Brisbane River from Wivenhoe to Colleges Crossing. Twin Bridges, Savages Crossing and Colleges Crossing were inundated earlier in the event. As a consequence of the increased release from Wivenhoe Dam, Burtons Bridge was inundated at around 00:40 on Tuesday 21 December 2010. Kholo Bridge was inundated around midday Tuesday 21 December 2010. In accordance with the adopted operational strategy these bridges should be back in service by late Thursday or Friday and all bridges (with the exception of Twin Bridges) should be trafficable for Christmas providing no further rainfall occurs. No future rainfall is currently included in these forecasts.

Advice from the BoM regarding predicted tides in the Brisbane River at the City Gauge, suggest that peak levels (1.7 to 1.8 m AHD) may reach or slightly exceed the minor flood level of 1.7 m AHD. The effect of the Wivenhoe release on these high tide values is estimated to be about 0.1m. Peak levels will coincide with high tides which are expected at about 11:00 am on Wednesday 22 December and around noon on Thursday 23 December. Tide levels will be monitored over the next few days and these estimates may be adjusted by BoM in light of changed observations. It is anticipated that this advice will be updated sometime today but no significant change to this advice is expected.

Emails have been sent to BCC, ICC and SRC this morning with similar information and requesting any assessments or concerns. If any are received they will be forwarded.

The BoM is aware of all releases.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
0410378740	0419378740

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

As above.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

BCC has been contacted by Flood Centre on ongoing basis.
Email sent to request any assessment.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	0414 501 398

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

ICC has been contacted by Flood Centre on ongoing basis.
Email sent to request any assessment.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	0417 620 225

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

SRC has been contacted by Flood Centre on ongoing basis.
Email sent to request any assessment.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	0409627313

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**		**Time**		**or Event**	Closing strategy

Barry Dennien

From: Ken Smith [Ken.Smith@premiers.qld.gov.au]
Sent: Wednesday, 22 December 2010 2:10 PM
To: Barry Dennien; John Bradley (JOhn.Bradley@derm.qld.gov.au)
Cc: Michael Lyons; Dan Spiller
Subject: RE: Media update - Dam releases

Thanks Barry. Can I get a copy of the fact sheet, albeit I understand it is a draft and will treat it as such.

Regards

Ken Smith
Director-General
Department of the Premier and Cabinet

Phone: 07 322 44728 Fax: 3229 2049
Mobile: 0417 730 013
Email: Ken.Smith@premiers.qld.gov.au

Tomorrow's Queensland: strong, green, smart, healthy and fair - www.towardQ2.qld.gov.au

---

From: Barry Dennien [mailto:Barry.Dennien@seqwgm.com.au]
Sent: Wednesday, 22 December 2010 2:03 PM
To: John Bradley (JOhn.Bradley@derm.qld.gov.au); Ken Smith
Cc: Michael Lyons; Dan Spiller
Subject: FW: Media update - Dam releases

Ken John

We will keep you updated on our press releases from now on.

Also see attached this morning's "Technical Situation Report"

This report is a key step in the Premier's flood release protocol.

Dan Spiller will shortly send through some advertising we are planning over the coming days with regards flood releases and Dam recreation.

I will send through a fact sheet on Wivenhoe Flood Management in the next few hours after it comes back from the editor.

Regards

Barry

From: SEQWGM Media
Sent: Wednesday, 22 December 2010 10:47 AM
Subject: Media update - Dam releases

22 December 2010 - Morning

Media update: Dam releases

Releases from Wivenhoe Dam continued overnight with all five spillway gates at Wivenhoe Dam opened.

The current release volume of 110,000 megalitres will be maintained until Thursday 23 December 2010, when releases are expected to reduce as the flood storage compartment empties.

Continued gate operations are being assessed depending on whether the forecasted level of rainfall and inflows is received over the Christmas period.

The Water Grid continues to work closely with local councils regarding the likely impacts of these releases on surrounding areas which include the closure of Twin Bridges, Savages Crossing, Colleges Crossing, Burtons Crossing and Kholo Crossing.

Releases equivalent to about 35,000 megalitres per day are continuing from Somerset Dam into Wivenhoe Dam, and are expected to continue depending on forecast rainfall.

The gates at Leslie Harrison Dam closed at 4.00pm yesterday, after a minor release was made.

Members of the public seeking information on potential impacts in their local areas should direct inquiries to their local councils.

For recorded information on current dam releases in South East Queensland, members of the public are encouraged to call **1800 613 122**.

Recreation update

While every effort will be made to keep recreational sites open, public safety is paramount and it is possible that some sites may be closed at short notice due to heavy weather.

Therefore, members of the public who are considering recreational activities including camping at South East Queensland dams over the Christmas/New Year period are urged to explore other options – have a plan B.

Currently, Somerset Dam has been re-opened for all water-based recreational activities, however this may change.

Likewise, Wivenhoe Dam has also been re-opened for all water-based recreational activities, however the following recreation sites at Wivenhoe remain closed:

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ENDS

Notes to the editor

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Jade Simmons
Senior Correspondence Officer
SEQ Water Grid Communications Unit
SEQ Water Grid Manager
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Visit: Level 15, 53 Albert Street Brisbane
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Sent: Wednesday, 22 December 2010 2:19 PM
To: 'Ken Smith'; John Bradley (JOhn.Bradley@derm.qld.gov.au)
Cc: Michael Lyons; Dan Spiller
Subject: RE: Media update - Dam releases
Attachments: Page 1 Factsheet changes.pdf; Page 2 Factsheet changes.pdf

Ken

See attached

Barry

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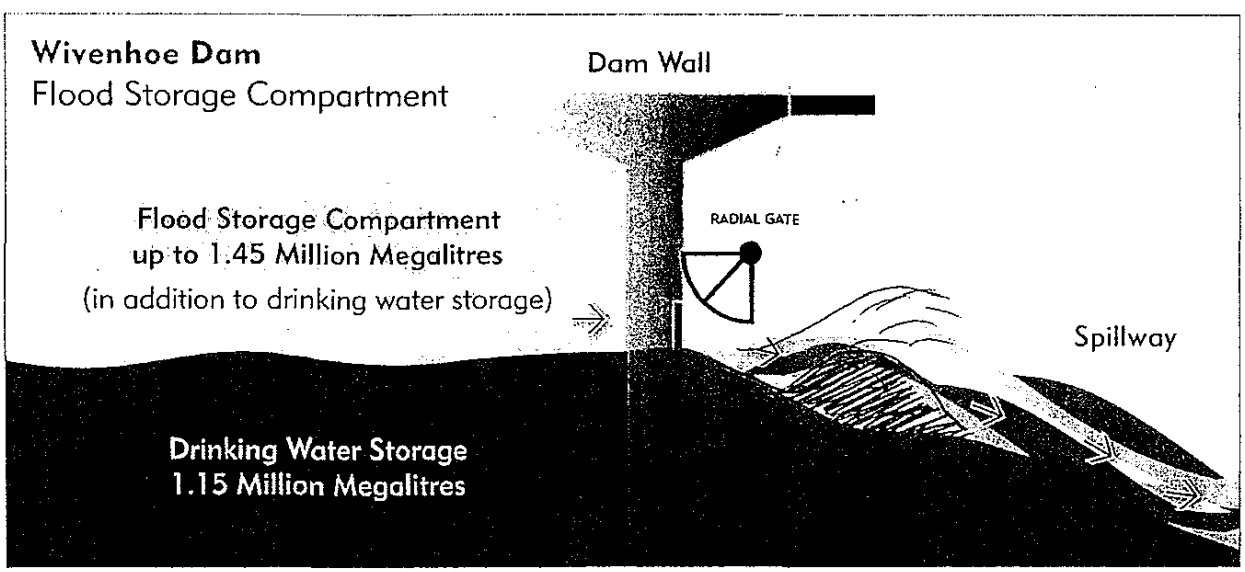
SEQ Water Grid

Wivenhoe & Somerset Dams

A FEW FACTS

- Wivenhoe Dam was built in response to the 1974 floods, and is an award winning feat of hydrological and structural engineering.
- Somerset Dam was completed in 1959. In the event of heavy rains, Somerset releases water downstream to Wivenhoe when it reaches full capacity.
- On top of storing as much as 1.15 million megalitres of precious drinking water, Wivenhoe can also store an additional 1.45 million megalitres, equal to 2.5 times the volume of Sydney Harbour. The space for this extra water is called the dam's flood storage compartment. Its job is to hold back the flood waters which gather in the Brisbane Valley and which can threaten Brisbane after heavy weather events.
- The flood storage compartment temporarily stores flood waters and releases them at a controlled rate so as to minimise downstream impacts. In other words, there will be much lower flood levels along the Brisbane River in the Ipswich and Brisbane urban areas than would have otherwise occurred without the dam.
- Wivenhoe Dam is able to withstand a flood with a 1 in 100,000 risk of occurring in any one particular year, an extremely rare event.
- In an event similar to January 1974, there would still be a large amount of local flooding in and around Ipswich and Brisbane due to the heavy local rainfall but water levels along the Brisbane River would be reduced due to the mitigating impact of Somerset and Wivenhoe dams.
- If it wasn't for Wivenhoe and Somerset dams, a considerable number of people, their properties and infrastructure could be at even greater risk of serious flood, this makes these dams a crucial component of South East Queensland's flood mitigation plan and something Queenslanders can be proud of.



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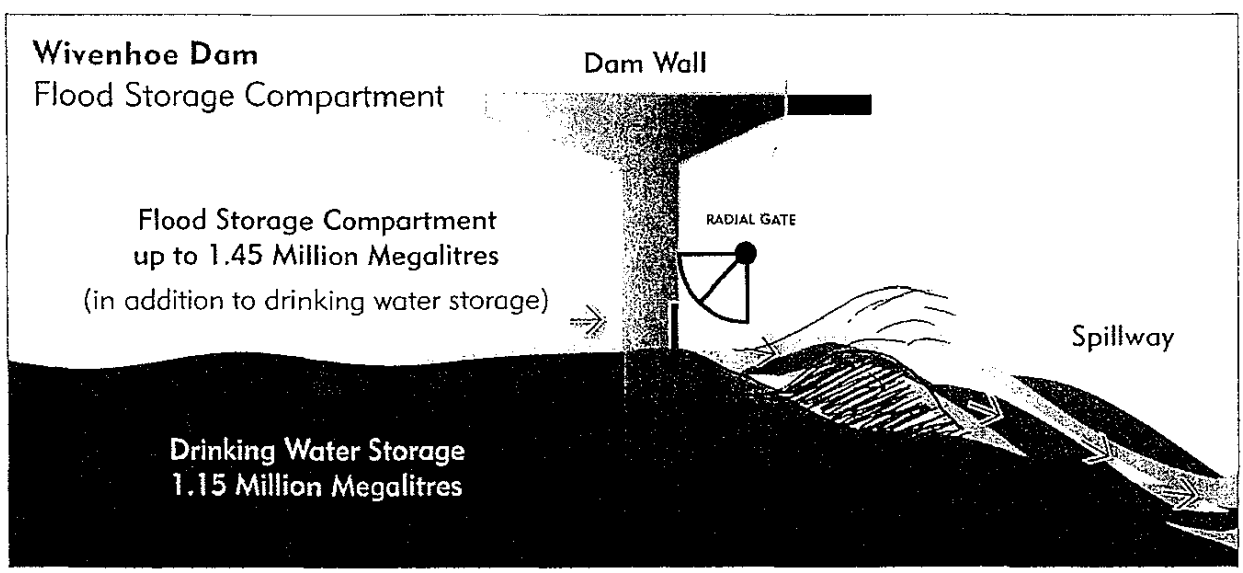

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Spectacular pictures - but why does Wivenhoe have to release stored flood water?

- South East Queensland has a weather pattern that often sees prolonged or multiple rain events in close succession.
- As soon as Wivenhoe's flood storage compartment begins to fill, it has to be carefully emptied. This has to be done in order to make room in case another heavy rainfall event arrives quickly. Before any release from the compartment the following flood factors are considered: catchment runoff below the dam wall, urban runoff and storm surges.
- Brisbane can still flood from other sources such as rainfall in the catchment below the dam wall and because Wivenhoe only controls 50% of the Brisbane Catchment.
- A fundamental principle is that all floodwater should be released within seven days. This means the greater the volume received in the flood storage compartment, the greater the discharge required.

How are the releases managed?

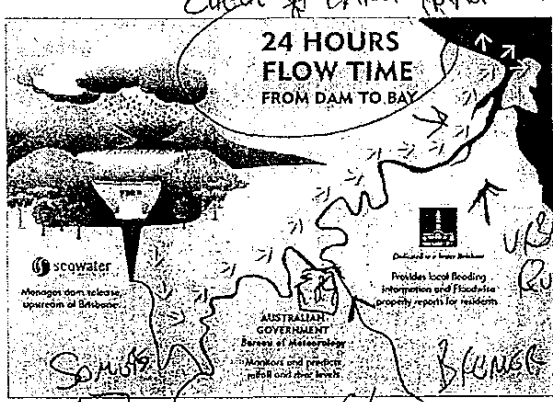
Before Wivenhoe begins a controlled emptying of its flood storage compartment, a dedicated 24hour Flood Operations Centre is activated for the specific purpose of managing the possible effects downstream.

The actions of the Flood Operations Centre are guided by a Flood Mitigation Manual. The Queensland State Government, local councils and all emergency services are notified before the water flows so that communities can be warned and take all necessary precautions.

The amount of water being released depends on the level currently inside the flood storage compartment, as well as the amount of incoming flows and flows in downstream tributaries.

Wivenhoe's managers therefore have to decide on how much to let go in order to keep Wivenhoe ready for more rain and safe.

During a major flooding event the Bureau of Meteorology, the Water Grid, Seqwater (Wivenhoe and Somerset Dam operators) and local councils work together to formulate advice and instructions for the public and relevant Emergency Services on how to manage impending localised flooding.



The Bureau of Meteorology, Seqwater and local councils continually monitor rainfalls throughout all South East Queensland catchments during a flood event. The Bureau of Meteorology provides rainfall forecasts for Seqwater's dam operators monitoring the surrounding catchments.

Using this information, a comprehensive network of river height sensors and real time rainfall data across the Wivenhoe catchment, Seqwater is then able to formulate a schedule of controlled dam releases to ensure the safety and integrity of the dam wall is maintained, and maximum protection from flooding in urban areas is achieved.

Based on the Bureau's forecasts and predictions, as well as Seqwater's dam releases, South East Queensland local councils then begin alerting residents to road and bridge closures, as well as advising on the severity and flows of the impending flood event.

The following priorities are considered when determining how much water has to be let go, and how fast:

- ensuring the structural safety of the dam
- providing maximum protection from flooding for urbanised areas
- minimising disruption to rural industries along the Brisbane River and Stanley River valleys
- retaining the storage at Full Supply Level at the conclusion of a flood event
- minimising impacts to riparian flora and fauna during the water release phase of a flood event.

How to prepare for flooding?

In the event of flooding, the Bureau of Meteorology, working together with the Water Grid, bulk water authorities and local councils to ensure minimal impact downstream after any dam releases. For information on local flooding, contact your local council for flood information packs and advice.

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seqwater LinkWater WaterSecure SEQ Water Grid

Barry Dennien

From: John Adcock
Sent: Wednesday, 22 December 2010 4:31 PM
To: Barry Dennien; Michael Lyons
Subject: Media Update - Dam releases
Attachments: image001.gif

Importance: High

Barry and Mike

Latest update ready to go and for your approval

22 December 2010 - Afternoon

Media update: Dam releases

Releases from all five spillway gates at Wivenhoe Dam are continuing.

In accordance with approved Flood Management Plans, the current release volume of 110,000 megalitres will be maintained until at least Thursday 23 December 2010, when releases are expected to reduce as the flood storage compartment empties.

Ongoing gate operations will be assessed depending on rainfall and inflows over the Christmas period.

The Water Grid continues to work closely with local councils regarding the likely impacts of these releases on surrounding areas which include the closure of Twin Bridges, Savages Crossing, Colleges Crossing, Burtons Crossing and Kholo Crossing.

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Members of the public who are considering recreational activities, including camping, at South East Queensland dams over the Christmas/New Year period are urged to consider alternative arrangements.

PLEASE NOTE: Conditions will be extremely dangerous as flood conditions exist in some areas.

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Notes to the editor

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Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Barry Dennien

From: Jade Simmons
Sent: Wednesday, 22 December 2010 4:53 PM
To: Barry Dennien
Cc: Michael Lyons; Aleisha Coote; Andrew Musgrave; John Adcock
Subject: speaking points - premiers - wivenhoe dam flood capacity
Attachments: speaking points - premiers - wivenhoe dam flood capacity.doc

Hi Barry – here it is – a little punchier and with your lines include.

Jade Simmons
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SEQ Water Grid Manager
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SEQ Water Grid

Speaking Points

TRIM reference: D/10/8065	Enquiry received: 22 December 2010
Purpose: Speaking points for the Premier	

SEQ Water Grid flood preparation

- Firstly I would like to reinforce a very important point - We will not take risks with the safety of South East Queensland during floods.
- What 1974's flood taught us was that having flood storage is critical control for the safety of people and property in the Brisbane region. We designed the Wivenhoe Dam based on 1974 and why would we change this - especially in this current wet period.
- While the drinking water compartment of Wivenhoe Dam at 100 per cent can store 1.2 million megalitres, the dam also has flood capacity over and above the space for drinking water supply.
- Wivenhoe flood storage has enormous capacity – 1.45 million megalitres – to put this in context, this amount is almost the equivalent of three times Sydney Harbour.
- It is this flood storage capacity that provides protection for South East Queensland during flood.

- The flood storage compartment of Wivenhoe allows us to control two things, control when releases are made to allow downstream flows to subside and control the rate of releases to relieve downstream flooding impacts. The more we have stored in the flood compartment the less control we have.

- Wivenhoe Dam has been designed to store and safely release a quantity of water equal to mammoth volumes.
- In accordance with the requirements of the *Water Supply Act 2008*, Seqwater maintains a comprehensive Dam Safety Management Program covering its 25 referable dams.
- The program ensures that each of its dams are operated and maintained in a manner that is both safe from a structural perspective and minimises the dam failure risks associated with flood events.
- This includes making arrangements with local councils and emergency management agencies for appropriate response to dam safety emergencies including flood events.
- The program has been endorsed and approved by the Dam Safety Regulator and met the standards required by the Queensland Dam Safety Management Guidelines and the international ANCOLD Guidelines on Dam Safety Management.

- To further protect South East Queensland, the Water Grid also mobilises a Flood Control Centre during a flood event at North Pine, Somerset or Wivenhoe Dams. It operates 24 hours a day with teams of operators at each dam 24 hours a day managing releases.
- Once levels are reached in Wivenhoe which require controlled flood gate operations, release instructions are issues by the Flood Control Centre, which is part of the Water Grid.
- We have also been able to best manage our dam release frequency. For example, recently with approval from the Flood Control Centre, Seqwater has held back water in Wivenhoe Dam while waiting for the Lockyer release flows to subside, which they now have.
- With the SEQ Water Grid in place, we have never been in a better position to help protect SEQ from flooding.
- Take October 2010's rain for example, during the time the gates were open, 655,000 megalitres were released from Wivenhoe Dam, which is equivalent to 262,000 olympic sized swimming pools.
- Prior to any releases, Seqwater advises relevant councils, including Brisbane City Council, of impending gate operations including release volumes. Regular contact is

made with relevant councils during the duration of the release event.

- Councils, working with emergency services, have the responsibility for determining the extent of any impact and any actions that may be required including local bridge and road closures.
- The Water Grid continues to work closely with local councils regarding the likely impacts of these releases on surrounding areas which include the closure of crossings.
- It is anticipated that during a large flood similar in magnitude to that experienced in 1974, by using the SEQ Water Grid mitigation facility within Wivenhoe Dam, flood levels will be reduced downstream by an estimated 2 metres.
-

Barry Dennien

From: Mike Foster [mfoster@seqwater.com.au]
Sent: Wednesday, 22 December 2010 5:05 PM
To: Michael Lyons
Cc: Rob Drury; Barry Dennien
Subject: RE: Premiers
Attachments: image001.gif

Michael,

Wivenhoe could effectively fill in as little as 2-3 **days.**

In the Oct event the majority of the 650,000ML (more than a Sydney Harbour worth of water or a half of Wivenhoe's drinking water capacity) flowed into Wivenhoe in three days.

Cheers Mike

From: Michael Lyons [mailto:Michael.Lyons@seqwgm.com.au]
Sent: Wednesday, 22 December 2010 4:44 PM
To: Mike Foster
Cc: Rob Drury
Subject: Premiers

Mate – very fast if you can. What was the fastest inflow rate into Wiv. Or how long did it take that 600,000 meg to get in into the Dam.. And how fast could Wiv fill up . Premier asking

---

From: Mike Foster [mailto:mfoster@seqwater.com.au]
Sent: Wednesday, 22 December 2010 2:01 PM
To: Michael Lyons; John Adcock
Subject: FW: Dam recreation - advertsing
Importance: High

Gents,

Nice job

As discussed back at Oct let's see if we can use the approval of the current CSAs to expand to TV CSAs for summer.

Good to use it also as a basis for local MP briefings – at least information kits for local MPs to use with their electorate.

Cheers Mike

From: John Adcock [mailto:John.Adcock@seqwgm.com.au]
Sent: Wednesday, 22 December 2010 1:11 PM
To: Mike Foster
Cc: Michael Lyons; Aleisha Coote
Subject: Dam recreation - advertsing
Importance: High

Mike

We have approval for $30k of advertising re: warnings on recreation sites.

We need to get your input quickly into scope of this message (Wivenhoe only v's all dams). We need to get radio script in by 1.30pm

Give me a call asap

Many thanks

John Adcock
Stakeholder Relations Manager
SEQ Water Grid Manager
Phone: (07) 3247 3015 | Fax: (07) 3405 0373 |
Email: john.adcock@seqwgm.qld.gov.au
Visit: Level 15, 53 Albert Street Brisbane
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ABN: 14783 317 630

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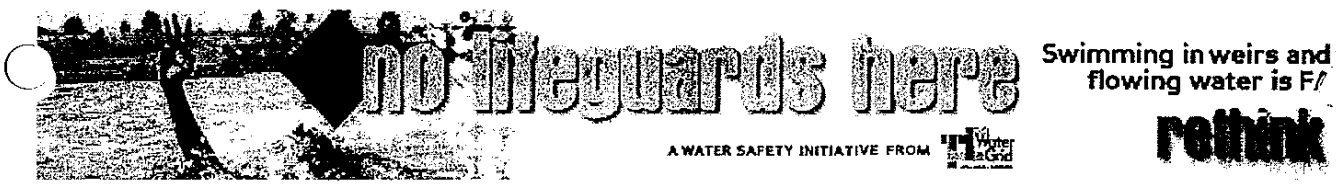

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From: John Adcock
Sent: Wednesday, 22 December 2010 5:19 PM
To: Barry Dennien; Michael Lyons
Subject: FW: Dam update draft FYI VERSION 2
Attachments: image001.gif

Importance: High

Barry and Mike

Revised Media Update on Dams per advice re: gates closing at Wivenhoe Dam. Please confirm approval.
Regards
John

From: Mike Foster [mailto:mfoster@seqwater.com.au]
Sent: Wednesday, 22 December 2010 5:20 PM
To: John Adcock
Subject: RE: Dam update draft FYI VERSION 2

Thanks very much for catching this one.

I need to talk to my guys.

All good to go

Cheers Mike

From: John Adcock [mailto:John.Adcock@seqwgm.com.au]
Sent: Wednesday, 22 December 2010 5:15 PM
To: Mike Foster
Subject: FW: Dam update draft FYI VERSION 2
Importance: High

Mike

Latest version with gate closures for your approval

Cheers

John

22 December 2010 - Afternoon

Media update: Dam releases

Wivenhoe Dam gates commenced closing at 4pm today with all expected to be shut by 2pm on Thursday 23 December. Water levels at Wivenhoe Dam are expected to be slightly below Full Supply Level by late Thursday.

Releases from Wivenhoe via the cone valves are expected to continue until further notice.

Future gate operations will be assessed depending on rainfall and inflows over the Christmas period.

The Water Grid continues to work closely with local councils regarding the likely impacts of these releases on surrounding areas including Twin Bridges, Savages Crossing, Colleges Crossing, Burtons Crossing and Kholo Crossing.

Members of the public seeking information on potential impacts in their local areas, including road closures, should direct inquiries to their local councils.

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Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further details contact the SEQ Water Grid Communications Unit on:
Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

From: Mike Foster [mailto:mfoster@seqwater.com.au]
Sent: Wednesday, 22 December 2010 4:21 PM
To: John Adcock
Subject: RE: Dam update draft FYI

Plan B was the go

From: John Adcock [mailto:John.Adcock@seqwgm.com.au]
Sent: Wednesday, 22 December 2010 4:17 PM
To: Mike Foster
Subject: RE: Dam update draft FYI

We used "alternative arrangements" after some feedback from Barry (I like Plan B but ....)

From: Mike Foster [mailto:mfoster@seqwater.com.au]
Sent: Wednesday, 22 December 2010 4:18 PM
To: John Adcock
Subject: RE: Dam update draft FYI

So we need something about the Plan B as per advert

Cheers Mike

From: John Adcock [mailto:John.Adcock@seqwgm.com.au]
Sent: Wednesday, 22 December 2010 4:09 PM
To: Mike Foster
Cc: Michael Lyons
Subject: FW: Dam update draft FYI

From: Shelley Banks
Sent: Wednesday, 22 December 2010 4:06 PM
To: John Adcock
Subject: RE: Dam update draft FYI

Hi John

I've made a few changes.

Shelley

Mike

Is this OK with you to go?

Cheers

John

22 December 2010 - Afternoon

Media update: Dam releases

Releases from all five spillway gates at Wivenhoe Dam are continuing.

In accordance with approved Flood Management Plans, the current release volume of 110,000 megalitres will be maintained until at least Thursday 23 December 2010, when releases are expected to reduce as the flood storage compartment empties.

Ongoing gate operations will be assessed depending on rainfall and inflows over the Christmas period.

The Water Grid continues to work closely with local councils regarding the likely impacts of these releases on surrounding areas which include the closure of Twin Bridges, Savages Crossing, Colleges Crossing, Burtons Crossing and Kholo Crossing.

Releases equivalent to about 35,000 megalitres per day are continuing from Somerset Dam into Wivenhoe Dam, and may continue depending on forecast rainfall.

Members of the public seeking information on potential impacts in their local areas, including road closures, should direct inquiries to their local councils.

For recorded information on current dam releases in South East Queensland, members of the public are encouraged to call **1800 613 122**.

Recreation update

Wivenhoe and Somerset dams have been re-opened for all water-based recreational activities, however this may change at short notice depending on weather.

The following recreation sites at Wivenhoe Dam remain closed:

- Hamon Cove
- Captain Logan Camp
- Billies Bay

Atkinson's Crossing at Wivenhoe Dam is currently open, however river access is closed. All other recreational sites have reopened however this status could change due to weather.

Lake Maroon is currently closed to swimming and skiing due to recent heavy rainfall, however boating and fishing are still currently allowed.

While every effort will be made to keep recreational sites open, public safety is paramount and it is possible that some sites may be closed at short notice due to poor weather.

Members of the public who are considering recreational activities, including camping, at South East Queensland dams over the Christmas/New Year period are urged to consider alternative arrangements.

PLEASE NOTE: Conditions will be extremely dangerous as flood conditions exist in some areas.

For further information on the Water Grid: www.watergrid.com.au

ENDS

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While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
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Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Barry Dennien

From: Dan Spiller
Sent: Wednesday, 22 December 2010 5:23 PM
To: Bradley John
Cc: Barry Dennien; Michael Lyons
Subject: Wivenhoe Dam talking points
Attachments: speaking points - premiers - wivenhoe dam flood capacity.doc

John,

As requested.

Regards,
Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
Phone: (07) 3405 0364 | Fax: (07) 3405 0373 | Mobile: 0403 607 857
Email: daniel.spiller@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

SEQ Water Grid

Speaking Points

TRIM reference: D/10/8065	Enquiry received: 22 December 2010
Purpose: speaking points on Wivenhoe Dam flood preparation	

SEQ Water Grid flood preparation

- ~~Firstly, I would like to reinforce a very important point -~~W~~-~~ we will not take risks with the safety of South East Queensland during flood events.
- ~~What~~ 1974~~'s flood~~ taught us was that ~~having~~ flood storage capacity is necessary to ensure ~~is a critical control for~~ the safety of people and property in the Brisbane region. ~~-~~The past two months have only highlighted this.
- Wivenhoe Dam was designed with 1.45 million megalitres of flood storage – equivalent to two and a half times Sydney Harbour.
- It is this flood storage capacity that provides protection for South East Queensland during flood – it is the only lever we have to control flooding in Ipswich and Brisbane.
- The flood storage compartment means that we can hold back flood water, and make controlled releases when downstream flows subside. For example, we recently held back water in

Wivenhoe Dam until after flows from the Lockyer Valley had passed.

- This is a large storage, but can potentially fill within less than three days in heavy rain.
- In October, over just three days, 655,000 megalitres flowed into the dam – that's the equivalent of 262,000 olympic sized swimming pools. Without the dam, and these controlled releases, this water would have flooded parts of Brisbane.
- South East Queensland has a history of back to back weather events, including 1974 and 1999. We must ensure that the flood compartment is emptied in controlled way, to make room for another event.
- ~~We designed the~~ Wivenhoe Dam has proven itself on a number of occasions and can be relied upon in even larger events, if operated properly. This is exactly what we are doing – w~~based on 1974 and w~~hy would we change ~~this,~~ especially in this current wet period?

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- ~~While~~ The drinking water compartment of Wivenhoe Dam ~~at 100 per cent~~ can store 1.2 million megalitres~~, the dam also has flood capacity over and above the space for drinking water supply~~.

- ~~Wivenhoe flood storage has enormous capacity — 1.45 million megalitres. To put this in context, this amount is almost the equivalent of three times Sydney Harbour. This flood storage can fill up in three days after heavy rain.~~
- ~~It is this flood storage capacity that provides protection for South East Queensland during flood.~~
- ~~The flood storage compartment of Wivenhoe allows us to control two things, control when releases are made to allow downstream flows to subside and control the rate of releases to relieve downstream flooding impacts. The more we have stored in the flood compartment the less control we have.~~
- ~~Wivenhoe Dam has been designed to store and safely release a quantity of water equal to mammoth volumes.~~
- In accordance with the requirements of the *Water Supply Act 2008*, Seqwater maintains a comprehensive Dam Safety Management Program covering its 25 referable dams.
- The program ensures that each of its dams are operated and maintained in a manner that is both safe from a structural perspective and minimises the dam failure risks associated with flood events.
- This includes making arrangements with local councils and emergency management agencies for appropriate response to dam safety emergencies including flood events.

- The program has been endorsed and approved by the Dam Safety Regulator and met the standards required by the Queensland Dam Safety Management Guidelines and the international ANCOLD Guidelines on Dam Safety Management.
- To further protect South East Queensland, the Water Grid also mobilises a Flood Control Centre during a flood event at North Pine, Somerset or Wivenhoe Dams. It operates 24 hours a day with teams of operators at each dam 24 hours a day managing releases.
- Once levels are reached in Wivenhoe which require controlled flood gate operations, release instructions are issues by the Flood Control Centre, which is part of the Water Grid.
- ~~We have also been able to best manage our dam release frequency. For example, recently with approval from the Flood Control Centre, Seqwater has held back water in Wivenhoe Dam while waiting for the Lockyer release flows to subside, which they now have.~~
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~~Wivenhoe Dam, which is equivalent to 262,000 olympic sized swimming pools.~~

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- Councils, working with emergency services, have the responsibility for determining the extent of any impact and any actions that may be required including local bridge and road closures.
- The Water Grid continues to work closely with local councils regarding the likely impacts of these releases on surrounding areas which include the closure of crossings.
- It is anticipated that during a large flood similar in magnitude to that experienced in 1974, by using the SEQ Water Grid mitigation facility within Wivenhoe Dam, flood levels will be reduced downstream by an estimated 2 metres.

Barry Dennien

From: SEQWGM Media
Sent: Wednesday, 22 December 2010 5:26 PM
Subject: Media Alert - Dam Releases
Attachments: image001.gif

22 December 2010 - Afternoon

Media update: Dam releases

Wivenhoe Dam gates commenced closing at 4pm today with all expected to be shut by 2pm on Thursday 23 December. Water levels at Wivenhoe Dam are expected to be slightly below Full Supply Level by late Thursday.

Releases from Wivenhoe via the cone valves are expected to continue until further notice.

Future gate operations will be assessed depending on rainfall and inflows over the Christmas period.

The Water Grid continues to work closely with local councils regarding the likely impacts of these releases on surrounding areas including Twin Bridges, Savages Crossing, Colleges Crossing, Burtons Crossing and Kholo Crossing.

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Barry Dennien

From: Bradley John [John.Bradley@derm.qld.gov.au]
Sent: Wednesday, 22 December 2010 5:54 PM
To: Dan Spiller
Cc: Barry Dennien; Michael Lyons
Subject: RE: Wivenhoe Dam talking points

Good stuff

Thanks

John Bradley
Director-General
Department of Environment and Resource Management
Telephone: 07 3330 6298
Email: John.Bradley@derm.qld.gov.au
www.derm.qld.gov.au

Department of Environment and Resource Management
400 George Street, Brisbane Q 4000
PO Box 2454, Brisbane Q 4001

From: Dan Spiller [mailto:Daniel.Spiller@seqwgm.com.au]
Sent: Wednesday, 22 December 2010 5:23 PM
To: Bradley John
Cc: Dennien Barry @ SEQWGM; Lyons Michael @ SEQWGM
Subject: Wivenhoe Dam talking points

John,

As requested.

Regards,
Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
Phone: (07) 3405 0364 | Fax: (07) 3405 0373 | Mobile: 0403 607 857
Email: daniel.spiller@seqwgm.com.au
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ABN: 14783 317 630

+----------+

Think B4U Print

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+----------+

Barry Dennien

From: Bradley John [John.Bradley@derm.qld.gov.au]
Sent: Wednesday, 22 December 2010 5:56 PM
To: Ken Smith
Cc: Dan Spiller; Barry Dennien; lance.mccallum@ministerial.qld.gov.au; Tim Watts; Geoff Stead
Subject: FW: Wivenhoe Dam talking points
Attachments: speaking points - premiers - wivenhoe dam flood capacity.doc

Ken

Barry and Dan have prepared the attached which look good to me.

If you are OK with them, they can be used to enrich the earlier draft of the fact sheet which Barry sent you earlier today.

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Barry Dennien

From: Ken Smith [Ken.Smith@premiers.qld.gov.au]
Sent: Wednesday, 22 December 2010 7:05 PM
To: 'Bradley John'
Cc: Dan Spiller; Barry Dennien; lance.mccallum@ministerial.qld.gov.au; Tim Watts; Geoff Stead
Subject: RE: Wivenhoe Dam talking points

Thanks John, Dan and | Barry

Will review tonight and get back to you. Much appreciated

Regards

Ken Smith
Director-General
Department of the Premier and Cabinet

Phone: 07 322 44728 Fax: 3229 2049
Mobile: 0417 730 013
Email: Ken.Smith@premiers.qld.gov.au

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From: Bradley John [mailto:John.Bradley@derm.qld.gov.au]
Sent: Wednesday, 22 December 2010 5:56 PM
To: Ken Smith
Cc: spiller daniel @ SEQWGM; Dennien Barry @ SEQWGM; lance.mccallum@ministerial.qld.gov.au; Tim Watts; Geoff Stead
Subject: FW: Wivenhoe Dam talking points

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For consideration,

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Subject: Wivenhoe Dam talking points

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As requested.

Regards,
Dan

Daniel Spiller
Director, Operations
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Barry Dennien

From: Aleisha Coote
Sent: Thursday, 23 December 2010 8:34 AM
To: Paul Bird
Cc: Dan Spiller; Scott Denner; Barry Dennien
Subject: RE: Release Update
Attachments: image002.gif; image003.jpg; image004.jpg

Hi Paul

Thanks for this. Can we please ensure Dan, Barry and Scott receive this daily update as well.

Thanks
Aleisha

Aleisha Coote
Senior Media Advisor
SEQ Water Grid Communications Unit
Phone: (07) 3224 7212 | Fax: (07) 3405 0373
Email: aleisha.coote@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

From: Paul Bird [mailto:pbird@seqwater.com.au]
Sent: Thursday, 23 December 2010 8:16 AM
To: SEQWGM Media; aroebuck@ipswich.qld.gov.au; greg.swain@brisbane.qld.gov.au; STUBBS@goldcoast.qld.gov.au; lisa.m.martin@brisbane.qld.gov.au; tjacobs@somerset.qld.gov.au
Cc: Mike Foster; Michael Lyons; Reception; Tara King; Arminda Roberts; Michael Fiechtner; Peter Borrows; Jim Pruss
Subject: Release Update

AS AT 8 AM THURSDAY 23 DECEMBER, THE FOLLOWING WATER RELEASES ARE BEING MADE:

WIVENHOE DAM:
THE GATE CLOSURE SEQUENCES IS UNDERWAY WITH ALL GATES EXPECTED TO BE CLOSED BY LATER TODAY, PROVIDING THERE IS NO FURTHER SIGNIFICANT RAINFALL. ONGOING OPERATIONAL RELEASES WILL BE MADE TO ASSIST IN MAINTAINING THE DAM LEVEL. AN ESTIMATED 320,000 MEGALITRES OF WATER HAS BEEN RELEASED.

FURTHER GATE OPERATIONS MAY BE NECESSARY IF FORECAST RAINFALL RESULTS IN SUBSEQUENT RIVER RISES.

LOCAL COUNCILS HAVE BEEN CONSULTED AND IT IS EXPECTED THAT THE MAJOR DOWNSTREAM CROSSINGS WILL BE RE-OPENED BY FRIDAY 24 DECEMBER.

SOMERSET DAM:
SLUICE GATE OPERATIONS ARE CONTINUING WITH ONCE SLUICE GATE CURRENTLY OPEN. THIS GATE WILL BE CLOSED AT AROUND 9:00AM THURSDAY 23 DECEMBER. A VALVE MAY THEN BE USED TO MAINTAIN THE LAKE LEVEL NEAR FULL SUPPLY LEVEL.

NORTH PINE DAM:
NORTH PINE GATES WERE CLOSED AT 5.00 AM TUESDAY 21 DECEMBER AND NO FURTHER GATE OPERATIONS ARE ANTICIPATED UNLESS THERE IS SIGNIFICANT RAINFALL. A SMALL CONE VALVE RELEASE WILL COMMENCE DURING THE MORNING OF THURSDAY 23 DECEMBER, BUT IS NOT EXPECTED TO IMPACT ON YOUNGS CROSSING

LESLIE HARRISON DAM:
NO RELEASES

HINZE DAM:
NO RELEASES

FOR DETAILED INFORMATION ON ROAD CROSSING CLOSURES AND OTHER POTENTIAL IMPACTS, ALWAYS CONTACT YOUR LOCAL COUNCIL.

RECREATION UPDATE:
WHILE EVERY EFFORT WILL BE MADE TO KEEP RECREATIONAL SITES OPEN, PUBLIC SAFETY IS PARAMOUNT AND IT IS POSSIBLE THAT SOME SITES MAY BE CLOSED AT SHORT NOTICE DUE TO HEAVY WEATHER.

THEREFORE, MEMBERS OF THE PUBLIC WHO ARE CONSIDERING RECREATIONAL ACTIVITIES, INCLUDING CAMPING, AT SOUTH EAST QUEENSLAND DAMS OVER THE CHRISTMAS/NEW YEAR PERIOD ARE URGED TO EXPLORE OTHER OPTIONS – HAVE A PLAN B.

CURRENTLY, SOMERSET DAM HAS BEEN REOPENED FOR ALL WATER-BASED RECREATIONAL ACTIVITIES, HOWEVER THIS MAY CHANGE.

LIKEWISE, WIVENHOE DAM HAS ALSO BEEN REOPENED FOR ALL WATER-BASED RECREATIONAL ACTIVITIES; HOWEVER THE FOLLOWING RECREATION SITES AT WIVENHOE REMAIN CLOSED:

- RIVER ACCESS AT ATKINSONS CROSSING
- BILLIES BAY

ALL OTHER RECREATIONAL SITES HAVE REOPENED. HOWEVER, IF FORECAST RAINFALL EVENTUATES, THIS MAY CHANGE.

Paul Bird
Senior Communications Advisor
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

P 07 3035 5519 M 0409 111 870 E pbird@seqwater.com.au
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

Barry Dennien

From: Tim Watts [Tim.Watts@ministerial.qld.gov.au]
Sent: Thursday, 23 December 2010 8:38 AM
To: Barry Dennien
Cc: Lance McCallum; Geoff Stead
Subject: Tech reports and grid media releases

Barry - as discussed, please send tech reports, sitreps and media releases to the following addresses - the Min would like to be kept in the loop directly:

Tim.Watts@ministerial.qld.gov.au
Lance.McCallum@ministerial.qld.gov.au
Geoff.Stead@ministerial.qld.gov.au
Stephen.Robertson@ministrial.qld.gov.au

Tim
Tim Watts
Policy Advisor
Office of the Minister for Natural Resources, Mines and Energy and Minister for Trade
Phone: (07) 3225 1797
Mobile: 0409 891 342
Fax: (07) 3225 1828

Barry Dennien

From: Geoff Stead [Geoff.Stead@ministerial.qld.gov.au]
Sent: Thursday, 23 December 2010 8:42 AM
To: Barry Dennien
Subject: FW: Tech reports and grid media releases

Hi Barry, also please include

Lauren.Sims@ministerial.qld.gov.au

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Barry - as discussed, please send tech reports, sitreps and media releases to the following addresses - the Min would like to be kept in the loop directly:

Tim.Watts@ministerial.qld.gov.au
Lance.McCallum@ministerial.qld.gov.au
Geoff.Stead@ministerial.qld.gov.au
Stephen.Robertson@ministrial.qld.gov.au

Tim
Tim Watts
Policy Advisor
Office of the Minister for Natural Resources,
Mines and Energy and Minister for Trade
Phone: (07) 3225 1797
Mobile: 0409 891 342
Fax: (07) 3225 1828

Barry Dennien

From: Paul Bird [pbird@seqwater.com.au]
Sent: Thursday, 23 December 2010 8:46 AM
To: Aleisha Coote
Cc: Dan Spiller; Scott Denner; Barry Dennien; Mike Foster
Subject: RE: Release Update
Attachments: image001.gif; image002.jpg; image003.jpg

No problems

From: Aleisha Coote [mailto:Aleisha.Coote@seqwgm.com.au]
Sent: Thursday, 23 December 2010 08:34
To: Paul Bird
Cc: Dan Spiller; Scott Denner; Barry Dennien
Subject: RE: Release Update

Hi Paul

Thanks for this. Can we please ensure Dan, Barry and Scott receive this daily update as well.

Thanks
Aleisha

Aleisha Coote
Senior Media Advisor
SEQ Water Grid Communications Unit
Phone: (07) 3224 7212 | Fax: (07) 3405 0373
Email: aleisha.coote@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

From: Paul Bird [mailto:pbird@seqwater.com.au]
Sent: Thursday, 23 December 2010 8:16 AM
To: SEQWGM Media; aroebuck@ipswich.qld.gov.au; greg.swain@brisbane.qld.gov.au; GSTUBBS@goldcoast.qld.gov.au; lisa.m.martin@brisbane.qld.gov.au; tjacobs@somerset.qld.gov.au
Cc: Mike Foster; Michael Lyons; Reception; Tara King; Arminda Roberts; Michael Fiechtner; Peter Borrows; Jim Pruss
Subject: Release Update

AS AT 8 AM THURSDAY 23 DECEMBER, THE FOLLOWING WATER RELEASES ARE BEING MADE:

WIVENHOE DAM:
THE GATE CLOSURE SEQUENCES IS UNDERWAY WITH ALL GATES EXPECTED TO BE CLOSED BY LATER TODAY, PROVIDING THERE IS NO FURTHER SIGNIFICANT RAINFALL. ONGOING OPERATIONAL RELEASES WILL BE MADE TO ASSIST IN MAINTAINING THE DAM LEVEL. AN ESTIMATED 320,000 MEGALITRES OF WATER HAS BEEN RELEASED.

FURTHER GATE OPERATIONS MAY BE NECESSARY IF FORECAST RAINFALL RESULTS IN SUBSEQUENT RIVER RISES.

LOCAL COUNCILS HAVE BEEN CONSULTED AND IT IS EXPECTED THAT THE MAJOR DOWNSTREAM CROSSINGS WILL BE RE-OPENED BY FRIDAY 24 DECEMBER.

SOMERSET DAM:
SLUICE GATE OPERATIONS ARE CONTINUING WITH ONCE SLUICE GATE CURRENTLY OPEN. THIS GATE WILL BE CLOSED AT AROUND 9:00AM THURSDAY 23 DECEMBER. A VALVE MAY THEN BE USED TO MAINTAIN THE LAKE LEVEL NEAR FULL SUPPLY LEVEL.

NORTH PINE DAM:
NORTH PINE GATES WERE CLOSED AT 5.00 AM TUESDAY 21 DECEMBER AND NO FURTHER GATE OPERATIONS ARE ANTICIPATED UNLESS THERE IS SIGNIFICANT RAINFALL. A SMALL CONE VALVE RELEASE WILL COMMENCE DURING THE MORNING OF THURSDAY 23 DECEMBER, BUT IS NOT EXPECTED TO IMPACT ON YOUNGS CROSSING

LESLIE HARRISON DAM:
NO RELEASES

HINZE DAM:
NO RELEASES

FOR DETAILED INFORMATION ON ROAD CROSSING CLOSURES AND OTHER POTENTIAL IMPACTS, ALWAYS CONTACT YOUR LOCAL COUNCIL.

RECREATION UPDATE:
WHILE EVERY EFFORT WILL BE MADE TO KEEP RECREATIONAL SITES OPEN, PUBLIC SAFETY IS PARAMOUNT AND IT IS POSSIBLE THAT SOME SITES MAY BE CLOSED AT SHORT NOTICE DUE TO HEAVY WEATHER.

THEREFORE, MEMBERS OF THE PUBLIC WHO ARE CONSIDERING RECREATIONAL ACTIVITIES, INCLUDING CAMPING, AT SOUTH EAST QUEENSLAND DAMS OVER THE CHRISTMAS/NEW YEAR PERIOD ARE URGED TO EXPLORE OTHER OPTIONS – HAVE A PLAN B.

CURRENTLY, SOMERSET DAM HAS BEEN REOPENED FOR ALL WATER-BASED RECREATIONAL ACTIVITIES, HOWEVER THIS MAY CHANGE.

LIKEWISE, WIVENHOE DAM HAS ALSO BEEN REOPENED FOR ALL WATER-BASED RECREATIONAL ACTIVITIES; HOWEVER THE FOLLOWING RECREATION SITES AT WIVENHOE REMAIN CLOSED:

- RIVER ACCESS AT ATKINSONS CROSSING
- BILLIES BAY

ALL OTHER RECREATIONAL SITES HAVE REOPENED. HOWEVER, IF FORECAST RAINFALL EVENTUATES, THIS MAY CHANGE.

Paul Bird
Senior Communications Advisor
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

P 07 3035 5519 M 0409 111 870 E pbird@seqwater.com.au
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002

Barry Dennien

From: Dan Spiller
Sent: Thursday, 23 December 2010 8:50 AM
To: Barry Dennien; John Adcock
Subject: FW: Technical Report W16
Attachments: image001.jpg; image002.png; Technical Stuation Report W16.docx

---

From: Rob Drury [mailto:rdrury@seqwater.com.au]
Sent: Thursday, 23 December 2010 8:39 AM
To: Dan Spiller
Cc: Peter Borrows; Jim Pruss; Mike Foster; Alex Fisher; Helen Moore
Subject: Technical Report W16

Technical Report W16 is attached.

It is covering the strategy up until early this morning.

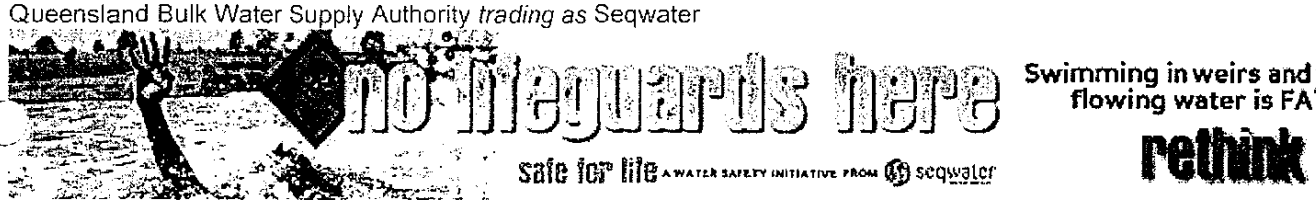
However rain has been falling in the Lockyer during the night and is continuing this morning. The Creek has now started to rise and it is possible that it may flood enough to affect our plan of getting the bridges out as planned.

If the Lockyer is going to affect the bridges anyway, we may have to change our strategy.

We will monitor and provide updates.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

Ph (07) 54278131 | Fax (07) 54261097 | M 0419378740 | E rdrury@seqwater.com.au
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

TECHNICAL SITUATION REPORT

TSR Number	W16	Date of TSR release	23.12.2010	Time of TSR release	8.00am

Seqwater status of inflows and dam operations

Somerset/Wivenhoe Dams

Somerset Dam

Sluice Gate operations are continuing with once sluice gate currently open. This gate will be closed at around 9:00am this morning. At this time the lake level will be around 99.10m or 100mm above the dam full supply level. A regulator may then be used to maintain the lake level near full supply level. The estimated inflow into Somerset Dam to date is 135,000ML, the majority of which has been discharged into Wivenhoe Dam.

Further gate operations may be necessary in coming days if forecast rainfall results in subsequent river rises.

Wivenhoe Dam

Radial Gate operations are occurring at Wivenhoe Dam with the gate closure sequence currently underway. The gate closure sequence has been developed to minimise adverse river bank impacts downstream of the dam, while also aiming to allow downstream river crossings to be open for Christmas day. All gates are currently scheduled to be closed by 1500 on Thursday 23 December 2010 (today) to allow for fish recovery in daylight hours. This assumes that no further significant rainfall occurs during the day. When the gates are closed, the lake level will be around 67.20m or 200mm above the dam full supply level and 50mm below the radial gate opening trigger level of 67.25m. A regulator will then be used to maintain the lake level near to or below this level. The estimated inflow into Wivenhoe Dam to date (excluding releases from Somerset Dam) is 204,000 ML. A total of 324000 ML has been released. The total estimated inflow into both dams for this event, based upon rainfall to date is 340,000 ML.

There is also the possibility of using a gate to make a low level ongoing release that may affect low levels bridges but keep the dam levels under control. Again this is rain dependent and will be decided later today.

Continued gate operations may be necessary if forecast rainfall results in subsequent river rises. The gate closure sequence will be reviewed throughout today and discussions with impacted Local Authorities will be ongoing.

Impacts of Wivenhoe Dam Releases

The releases from Wivenhoe Dam have resulted in elevated levels in the Brisbane River downstream to Colleges Crossing. Twin Bridges, Savages Crossing, Colleges Crossing, Burtons Bridge and Kholo Bridge are currently all closed due to inundation resulting from these releases. In accordance with the

current operational strategy all bridges (with the exception of Twin Bridges) should be trafficable by Friday. Projected "early side" times for bridges becoming clear of water based on the current gate closure sequence and no Lockyer Creek outflows are as follows. (Note that rainfalls of up to 33mm have been observed in the Lockyer Creek Catchment over the last 24 hours, but no significant stream rises have been observed as yet). These are estimates only.

Burtons Bridge – 18:00 Thursday 23 December 2010.
Savages Crossing – 19:00 Thursday 23 December 2010
Kholo Bridge – 21:00 Thursday 23 December 2010
Colleges Crossing – 08:00 Friday 23 December 2010

Tide levels continue to be monitored closely with peak tide estimates being adjusted by BOM to account for Wivenhoe Dam outflows.

The BoM is aware of all releases.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
0410378740	0419378740

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and is in line with previous strategy.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	0414 501 398

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and is in line with previous strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	0417 620 225

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and is in line with previous strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	0409627313

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date		Time		or Event	Closure

Barry Dennien

From: John Adcock
Sent: Thursday, 23 December 2010 9:21 AM
To: Tony Jacobs
Subject: RE: Impacts of dam releases on Somerset Council residents (eg: England's Creek Rd)
Attachments: image001.gif; Radio text - Weather warning for campers.doc; Advertising text - Weather warning for campers.doc

Thanks Tony

Do you know when the letter might go out to these people?

FYI please find attached copies of Community Service Announcement materials being released today. The print advert will appear Monday and the radio will run today and tomorrow.

You raise some valid points Tony that our collective actions may miss some people however I guess we need to do, and be seen to do, as much as we possibly can to assist people impacted by these events.

key message worth considering to put Somerset Regional Council website may be *"for information on dam releases please call 1 800 613 122 or go to www.watergrid.com.au"*

I'm sure Barry will be glad to hear from Bob and discuss the great work Somerset is doing by creating this database and sending out the letter.

Many thanks and regards
John

From: Tony Jacobs [mailto:TJacobs@somerset.qld.gov.au]
Sent: Thursday, 23 December 2010 8:41 AM
To: John Adcock
Subject: RE: Impacts of dam releases on Somerset Council residents (eg: England's Creek Rd)

John,

Council would have mailing info from the rates data base and I have seen a list that was extracted yesterday afternoon and a draft letter to those people offering to place their contact details on a data list with mobile contact details.
I believe Bob is to talk to Barry about making this offer and methods/options for making contact.

Although it may help one issue, I believe it will create other problems. There will be people other than the residents in the two areas isolated that will feel they need to be contacted. Should the data base be open to all and how do we control numbers? The success rate on contact via SMS that EMQ recently trialled was only about 60%. Managing negative customers in the 40% will be an issue.

Tony Jacobs
Manager Operations
Somerset Regional Council
2 Redbank Street, Esk QLD 4312

Ph: (07) 54244000
Fax: (07) 54244099
Email: tjacobs@somerset.qld.gov.au

From: John Adcock [mailto:John.Adcock@seqwgm.com.au]
Sent: Wednesday, 22 December 2010 2:05 PM
To: Tony Jacobs
Cc: Michael Lyons; Shelley Banks
Subject: Impacts of dam releases on Somerset Council residents (eg: England's Creek Rd)

Tony

Thanks for your input into the Community Service Announcement which has just gone and for your support with key messages on your council's website.

My CEO Barry Dennien has just advised he spoke with Bob Bain this morning regarding a resident complaint which came through via the Minister's office late yesterday. This chap was based around England's Creek Road and claims no-one contacted him and other residents regarding local road being cut-off.

I understand Bob and Barry discussed ensuring data regarding residents likely to be cut-off by dam releases is gathered and options for contacting these people. To what extent does Somerset Council have information on the location and contact details of these residents?

Cheers

John Adcock
Stakeholder Relations Manager
SEQ Water Grid Manager
Phone: (07) 3247 3015 | Fax: (07) 3405 0373 |
Email: john.adcock@seqwgm.qld.gov.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Water Grid

Advertisement text
– recreation safety

RADIO TEXT – RECREATION SAFETY

WATER GRID COMMUNITY SERVICE ANNOUNCEMENT

Wet weather means that water releases from dams across South East Queensland are likely to continue this holiday season.

To find out the latest information on dam releases call 1800 613 122.

The Water Grid is making every effort to keep recreational sites open, but public safety is paramount. Some sites may need to be closed at short notice. Visit www.watergrid.com.au for the latest information.

For information on local flooding, including road closures, contact the local council or visit their website.

ADVERTISEMENT TEXT – RECREATION SAFETY

WATER GRID COMMUNITY SERVICE ANNOUNCEMENT

Wet weather means that water releases from dams across the region are likely to continue this holiday season.

For daily information on dam releases in South East Queensland, contact 1800 613 122.

While every effort will be made to keep recreational sites open, public safety is paramount and it is possible that some sites may be closed at short notice due to heavy weather.

The Water Grid is urging campers at South East Queensland dams to consider a plan B this holiday season.

For more information on the status of dam levels and Water Grid recreation sites visit www.watergrid.com.au

For information on local flooding, including road closures, contact the local council or visit their website.

The council areas that are affected by Wivenhoe Dam releases are:

- Somerset Regional Council; 5424 4000; www.somerset.qld.gov.au
- Ipswich City Council; 3810 6666; www.ipswich.qld.gov.au
- Brisbane City Council; 3403 8888; www.brisbane.qld.gov.au

Barry Dennien

From: SEQWGM Media
Sent: Thursday, 23 December 2010 10:53 AM
Subject: Media Alert - Dam Releases
Attachments: image001.gif

23 December 2010 - Morning

Media update: Dam releases

Wivenhoe Dam gates commenced closing at 4pm yesterday. It is expected that all gates will be shut by mid afternoon today providing there is no further significant rainfall. Since the gates were opened, 320 000 megalitres of water has been released from Wivenhoe Dam.

Operational releases from Wivenhoe via the cone valves will continue.

Future gate operations will be assessed depending on rainfall and inflows over the Christmas period.

Local councils have been consulted and it is expected that major downstream crossings will be open by tomorrow.

A small cone valve release from North Pine Dam commenced this morning but is not expected to impact on Youngs Crossing Road.

Members of the public seeking information on potential impacts in their local areas, including road closures, should direct inquiries to their local councils.

For recorded information on current dam releases in South East Queensland, members of the public are encouraged to call **1800 613 122**.

Recreation update

Wivenhoe and Somerset dams are open for all water-based recreational activities, however this may change at short notice depending on weather.

The following recreation sites at Wivenhoe Dam remain closed:

- Billies Bay
- River access at Atkinsons Crossing

All other recreational sites have reopened however this status could change due to weather.

While every effort will be made to keep recreational sites open, public safety is paramount and it is possible that some sites may be closed at short notice due to poor weather.

Members of the public who are considering recreational activities, including camping, at South East Queensland dams over the Christmas/New Year period are urged to consider alternative arrangements.

PLEASE NOTE: Conditions will be extremely dangerous as flood conditions exist in some areas.

For further information on the Water Grid: www.watergrid.com.au

ENDS

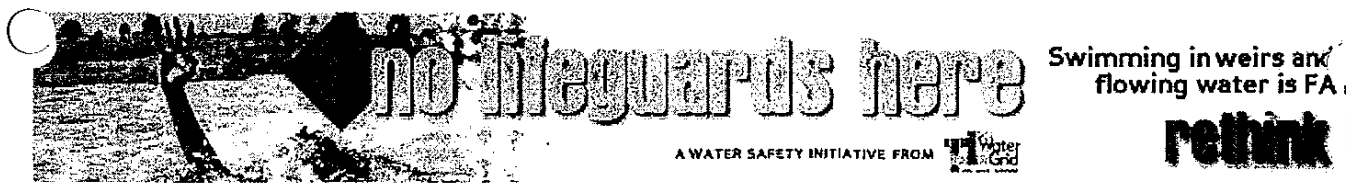
Notes to the editor

About the SEQ Water Grid

Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further details contact the SEQ Water Grid Communications Unit on:
Ph: (07) 3247 3000 | Email: media@seqwgm.com.au



Barry Dennien

From: John Adcock
Sent: Thursday, 23 December 2010 11:10 AM
To: Dan Spiller; Barry Dennien
Subject: FW: Sandgate Rd
Attachments: IMG00128-20101223-1040.jpg

Sandgate Rd 20 mins ago – just received from BCC

From: Lisa.M Martin [mailto:Lisa.M.Martin@brisbane.qld.gov.au]
Sent: Thursday, 23 December 2010 11:08 AM
To: John Adcock
Subject: Fwd: Sandgate Rd

>>> Michael Bell 23/12/2010 10:43 am >>>
Fyi

Barry Dennien

From: Dan Spiller
Sent: Thursday, 23 December 2010 11:28 AM
To: Bradley John; ken.smith@premiers.qld.gov.au
Cc: Barry Dennien; Best Debbie; Tim Watts
Subject: FW: Brisbane City Council Community Service Announcement: Minor tidalflooding starting to occur in river
Attachments: IMG00128-20101223-1040.jpg; Technical Stuation Report W16.docx

Ken and John,

The River has peaked at 1.95 m at the Port Office, up from 1.85 m yesterday (see http://www.bom.gov.au/fwo/IDQ65389/IDQ65389.540198.tbl.shtml).

Below is a media release issued by BCC communications team. They also provided us the attached image of Sandgate Road at the time of the peak.

Also attached is the latest Technical Situation Report. Gate closure commenced yesterday at 1600 and will be complete by 1500. Our current objective is to reopen local bridges for Christmas – providing respite for the 20 odd households that have been isolated and the others that are inconvenienced (as requested by the local Councils). Note that Lockyer Valley flows are increasing and may be sufficient to flood some of the lower crossings. If this occurs, we will review our release strategy in anticipation of further inflows.

Regards,

Dan

From: Lisa.M Martin [mailto:Lisa.M.Martin@brisbane.qld.gov.au]
Sent: Thursday, 23 December 2010 10:57 AM
To: Hunwick, Adrienne; Wilson, Alena; McNeil, Allan; Marshall, Amber; Buckwell, Andrew; Edwards, Belinda; Lawrence, Bethany; Wood, Brad; Walker, Brenda; Johnson, Bronwyn; Grace, Cassie; Coughlan, Cate; Chappell, Catherine; Nicholls, Chloe; Glanfield-Pook, Chris; Coomber, Christine; Salter, Christopher; Stevens, Craig; Harrison, Dana; Moody, David; McGhee, Eirin; Torcaso, Felicity; Archontoulis, Fiona; Longhurst, Freya; Kerr, Geoff.b; Foley, Jerry; Swain, Greg; Stevenson, Hannah; Kowaliauskas, Isis; Cooper, Jamie; Falconer, Jane; Flett, Jane; Hannan, Jess; Plowman, Jo; McGill, Joanne; Veraa, Joe; Ada, Joshua; Iles, Julia; Edwards, Karen; Murphy, Karen; Stepien, Kasia; Haddan, Kate; Keating, Katrina; Mather, Kimberley; deHesse, Kirsten; Booth, Krysten; Kerr, Lakshmi; Foster, Laura; Martin, Lisa.M; Dixon, Melissa; Nelson, Melissa; Forwood, Miranda; Talbot, Nerida; Pham, Nhi; Beveridge, Nic; O'Donnell, Nicholas; Gibson, Nicole; Shelley, Rosie; VonBayer, Sabrina; Cecchini, Samantha; Coffey, Sarah; Fox, Sarah; Wade, Sarah; Gibson, Scott; Graetz, Sonja; Spina, Steven; Leadbetter, Tanya; Doherty, Taryn; Whitelaw, Tracy; Parker, Victoria
Cc: Bell, Michael; Lavin, Chris; Logan, Craig; Oberto, Klynt
Subject: Fwd: Brisbane City Council Community Service Announcement: Minor tidalflooding starting to occur in river

FYI - this has just been distributed.

>>> "Media Release" <MediaRelease@Mediamonitors.com.au> 23/12/2010 10:53 am >>>
Minor tidal flooding is starting to occur in some areas of Brisbane due to higher than usual tides.

This morning's high tide has already had an impact on CityCat and CityFerry services with the Bulimba, Teneriffe and Hawthorne terminals and services now closed. All operating services are now running at reduced speeds and not to timetable. These service changes are expected to be in effect until approximately midday.

Minor tidal flooding is expected to occur on low-lying roads, bikeways and parks this morning in parts of the following suburbs as previously advised: Windsor, Albion, Bowen Hills, Newstead, East Brisbane, Woolloongabba, Teneriffe, Lota, Wynnum and Hemmant.

Sandbags are available if required.

Motorists are advised that roads affected by tidal flooding may be closed during and following the high tide peak.

-ENDS-

This message has passed through an insecure network.
Please direct all enquiries to the message author.

TECHNICAL SITUATION REPORT

TSR Number	W16	Date of TSR release	23.12.2010	Time of TSR release	8.00am

Seqwater status of inflows and dam operations

Somerset/Wivenhoe Dams

Somerset Dam

Sluice Gate operations are continuing with once sluice gate currently open. This gate will be closed at around 9:00am this morning. At this time the lake level will be around 99.10m or 100mm above the dam full supply level. A regulator may then be used to maintain the lake level near full supply level. The estimated inflow into Somerset Dam to date is 135,000ML, the majority of which has been discharged into Wivenhoe Dam.

Further gate operations may be necessary in coming days if forecast rainfall results in subsequent river rises.

Wivenhoe Dam

Radial Gate operations are occurring at Wivenhoe Dam with the gate closure sequence currently underway. The gate closure sequence has been developed to minimise adverse river bank impacts downstream of the dam, while also aiming to allow downstream river crossings to be open for Christmas day. All gates are currently scheduled to be closed by 1500 on Thursday 23 December 2010 (today) to allow for fish recovery in daylight hours. This assumes that no further significant rainfall occurs during the day. When the gates are closed, the lake level will be around 67.20m or 200mm above the dam full supply level and 50mm below the radial gate opening trigger level of 67.25m. A regulator will then be used to maintain the lake level near to or below this level. The estimated inflow into Wivenhoe Dam to date (excluding releases from Somerset Dam) is 204,000 ML. A total of 324000 ML has been released. The total estimated inflow into both dams for this event, based upon rainfall to date is 340,000 ML.

There is also the possibility of using a gate to make a low level ongoing release that may affect low levels bridges but keep the dam levels under control. Again this is rain dependent and will be decided later today.

Continued gate operations may be necessary if forecast rainfall results in subsequent river rises. The gate closure sequence will be reviewed throughout today and discussions with impacted Local Authorities will be ongoing.

Impacts of Wivenhoe Dam Releases

The releases from Wivenhoe Dam have resulted in elevated levels in the Brisbane River downstream to Colleges Crossing. Twin Bridges, Savages Crossing, Colleges Crossing, Burtons Bridge and Kholo Bridge are currently all closed due to inundation resulting from these releases. In accordance with the

current operational strategy all bridges (with the exception of Twin Bridges) should be trafficable by Friday. Projected "early side" times for bridges becoming clear of water based on the current gate closure sequence and no Lockyer Creek outflows are as follows. (Note that rainfalls of up to 33mm have been observed in the Lockyer Creek Catchment over the last 24 hours, but no significant stream rises have been observed as yet). These are estimates only.

Burtons Bridge – 18:00 Thursday 23 December 2010.
Savages Crossing – 19:00 Thursday 23 December 2010
Kholo Bridge – 21:00 Thursday 23 December 2010
Colleges Crossing – 08:00 Friday 23 December 2010

Tide levels continue to be monitored closely with peak tide estimates being adjusted by BOM to account for Wivenhoe Dam outflows.

The BoM is aware of all releases.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
0410378740	0419378740

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and is in line with previous strategy.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	0414 501 398

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and is in line with previous strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	0417 620 225

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and is in line with previous strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	0409627313

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**		**Time**		**or Event**	Closure

Barry Dennien

From: Aleisha Coote
Sent: Thursday, 23 December 2010 11:59 AM
To: Dan Spiller; Barry Dennien
Cc: SEQWGM Communications Staff
Subject: FW: Channel 10

Importance: High

Hi Barry and Dan

Are you guys happy with the wording below (signed off by Seqwater):

Water released from Wivenhoe Dam generally takes around 24 - 36 hours to reach central Brisbane.

Aleisha Coote
Senior Media Advisor
SEQ Water Grid Communications Unit
Phone: (07) 3224 7212 | Fax: (07) 3405 0373
Email: aleisha.coote@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

-----Original Message-----
From: Paul Bird [mailto:pbird@seqwater.com.au]
Sent: Thursday, 23 December 2010 11:57 AM
To: Aleisha Coote; Mike Foster
Cc: SEQWGM Communications Staff
Subject: RE: Channel 10

Hi Aleisha,

Happy with that response,

Paul

-----Original Message-----
From: Aleisha Coote [mailto:Aleisha.Coote@seqwgm.com.au]
Sent: Thursday, 23 December 2010 11:54
To: Mike Foster; Paul Bird
Cc: SEQWGM Communications Staff
Subject: FW: Channel 10

Hi Mike and Paul

Please note the email below from Channel 10, are you happy with the below response:

Water released from Wivenhoe Dam generally takes around 24 - 36 hours to reach central Brisbane.

Thanks
Aleisha

Aleisha Coote
Senior Media Advisor
SEQ Water Grid Communications Unit
Phone: (07) 3224 7212 | Fax: (07) 3405 0373
Email: aleisha.coote@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

-----Original Message-----
From: Sarah Horsley [mailto:Shorsley@networkten.com.au]
Sent: Thursday, 23 December 2010 11:14 AM
To: SEQWGM Media
Subject: Hello there,

Hello there,
Sarah here from ten news. Just wondering how long it takes for water released from wivenhoe to reach hamilton section of brisbane river - 1 -
3 days??

Barry Dennien

From: Reilly Bob [Bob.Reilly@derm.qld.gov.au]
Sent: Thursday, 23 December 2010 12:06 PM
To: Best Debbie; Barry Dennien
Cc: Peter Borrows
Subject: FW: Wivenhoe floodwater releases: impacts on access arrangements for people--possible assistance

Debbie/Barry

Further to my email below, I have discussed this matter with Peter Borrows. I suggest we meet with Peter Borrows soon to discuss the best way forward, using the approach outlined below as a starting point.

Background

- We cannot afford to compromise the flood release strategy from Wivenhoe.

There are 32 residents serviced by Bartons Crossing across the Brisbane River, who lose all access once the combined base flow in the river plus releases from Wivenhoe, exceed 300 cubic meters per second. (This volume has been exceeded in the two releases this year) Unlike all other people affected by low level releases from Wivenhoe, they have no alternative access, and have lost access for over five days on each occasion.

- Somerset Council endeavours to notify them 24 hours before a release, but this does not always happen (However, this is the Council's responsibility)

Proposed approach

- Somerset Council be asked, by Seqwater, if they would be willing to arrange with the affected residents for the delivery of supplies e.g. by boat, if they lose access due to flood releases for more than, say, five days (or some other agreed number of days).

Precise arrangements would be negotiated between Council and the residents, and these ould be flexible to meet their needs.

- Seqwater would reimburse Council for the reasonable costs involved.

- The communication message would be that these residents are experiencing significant inconvenience (through having no alternative access) as a result of the flood releases, so it is reasonable for the wider community to make a financial contribution, through Seqwater, towards alleviating this inconvenience.

Regards

Bob

Bob Reilly

General Manager, Office of the Water Supply Regulator

Telephone: 07 3224 2898 **Mobile:** 0408 985 852 **Facsimile:** 07 3224 7999

Email: bob.reilly@derm.qld.gov.au

www.derm.qld.gov.au

Department of Environment and Resource Management

Lvl 3 41 George Street, Brisbane Q 4000

GPO Box 2454, Brisbane Q 4001

From: Reilly Bob
Sent: Wednesday, 22 December 2010 9:27 AM
To: pborrows@seqwater.com.au
Cc: Dennien Barry @ SEQWGM; Lyons Michael @ SEQWGM; rdrury@seqwater.com.au; Best Debbie
Subject: Wivenhoe floodwater releases: impacts on access arrangements for people

Hi Peter

The nature of the flood releases is such that a certain number of low level crossings are submerged for a longer period of time, than would be the case in the absence of the releases.

For many of the people whose access may be affected by the floodwater releases, alternative (albeit with longer travel times) access arrangements, are available.

However, are their people who do not have alternative access arrangements? If so, roughly how many, and in what locations? Has Council/Seqwater provided them with some support arrangements to deal with these access issues?

The reason I ask is that is one thing to ask for such people to be inconvenienced (in the absence of some support arrangements) for a few days once every 5 to 10 years, but it is another matter if these events occur on a monthly (or more frequent basis) basis—as may well happen over the next few months.

If you could give me a ring to discuss the matter later this week, then that would be appreciated.

Thanks

Bob

Bob Reilly

General Manager, Office of the Water Supply Regulator

Telephone: 07 3224 2898 **Mobile:** 0408 985 852 **Facsimile:** 07 3224 7999

Email: bob.reilly@derm.qld.gov.au

www.derm.qld.gov.au

Department of Environment and Resource Management

Lvl 3 41 George Street, Brisbane Q 4000

GPO Box 2454, Brisbane Q 4001

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+----------+

Barry Dennien

From: Barry Dennien
Sent: Thursday, 23 December 2010 12:11 PM
To: 'Bradley John'; 'Ken Smith'
Subject: Updated Wivenhoe fact sheet
Attachments: 32253 SEQWG Wivenhoe Fact Sheet A4 2pp 3.pdf; image001.gif

Ken / John

Any final thoughts, we would like to get this on the web tonight.

We have updated with facts from the talking point sheet yesterday

Regards

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
Phone: (07) 3033 0785 | **Fax:** (07) 3405 0373 | **Mobile:** 0419725708
Email: barry.dennien@seqwgm.com.au
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

SEQ Water Grid

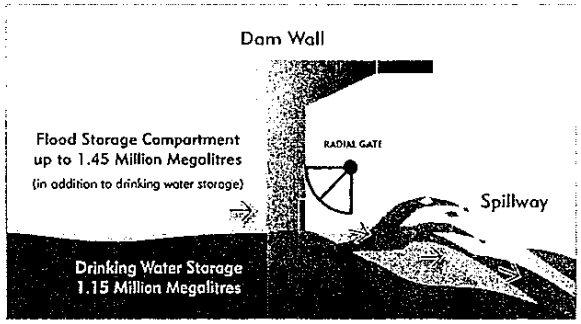
Wivenhoe and Somerset Dams

Providing water supply and flood control

A FEW FACTS

- Wivenhoe Dam was built in response to the 1974 floods, and is an award winning feat of hydrological and structural engineering.
- Somerset Dam was completed in 1959. In the event of heavy rains, Somerset releases water downstream to Wivenhoe when it reaches full capacity.
- On top of storing as much as 1.15 million megalitres of precious drinking water, Wivenhoe can also store an additional 1.45 million megalitres, equal to 2.5 times the volume of Sydney Harbour. The space for this extra water is called the dam's flood storage compartment. Its job is to hold back the flood waters which gather in the Brisbane Valley and which can threaten Brisbane after heavy weather events.
- The flood storage compartment temporarily stores flood waters and releases them at a controlled rate so as to minimise downstream impacts. In other words, there will be much lower flood levels along the Brisbane River in the Ipswich and Brisbane urban areas than would have otherwise occurred without the dam.
- Wivenhoe Dam Wall is able to withstand a flood with a 1 in 100,000 risk of occurring in any one particular year, an extremely rare event.
- In an event similar to January 1974, there would still be a large amount of local flooding in and around Ipswich and Brisbane due to the heavy local rainfall but water levels along the Brisbane River would be reduced due to the mitigating impact of Somerset and Wivenhoe dams.

Wivenhoe Dam Flood Storage Compartment



- If it wasn't for Wivenhoe and Somerset dams, a considerable number of people, their properties and infrastructure could be at even greater risk of serious flood, this makes these dams a crucial component of South East Queensland's flood mitigation plan and something Queenslanders can be proud of.

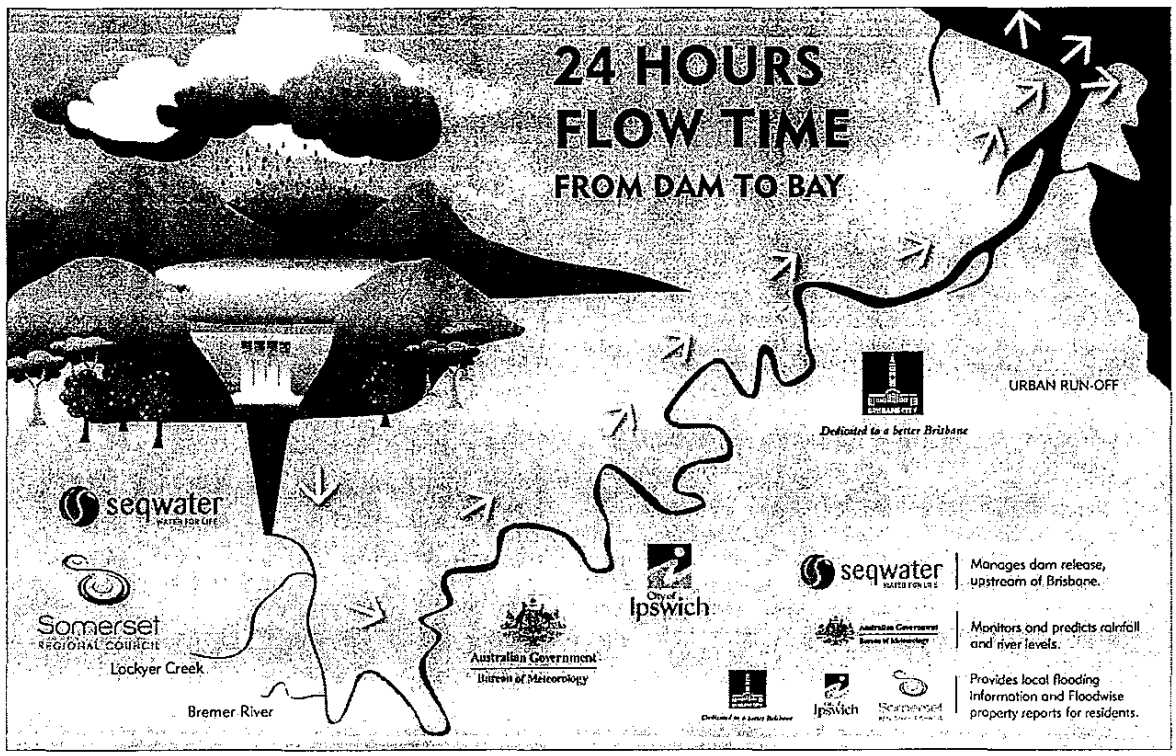
Spectacular pictures - but why does Wivenhoe have to release stored flood water?

- South East Queensland has a weather pattern that often sees prolonged or multiple rain events in close succession.
- As soon as Wivenhoe's flood storage compartment begins to fill, it has to be carefully emptied. This has to be done in order to make room in case another heavy rainfall event arrives quickly, as the compartment can fill in 3 days in heavy rain. Controlled Releases consider the following flood factors: catchment runoff below the dam wall, urban runoff and river levels.
- Brisbane can still flood from other sources such as rainfall in the catchment below the dam wall, and because Wivenhoe only controls 50% of the Brisbane Catchment.
- A fundamental principle is that all floodwater should be released within seven days. This means the greater the volume received in the flood storage compartment, the greater the discharge required.

safe secure sustainable

www.watergrid.com.au

seqwater LinkWater WaterSecure SEQ Water Grid



How are the releases managed?

Before Wivenhoe begins a controlled emptying of its flood storage compartment, a dedicated 24hour Flood Operations Centre is activated for the specific purpose of managing the possible effects downstream.

The actions of the Flood Operations Centre are guided by a Flood Mitigation Manual. The Queensland State Government, local councils and all emergency services are consulted before the water flows so that communities can be warned and take all necessary precautions.

The amount of water being released depends on the level currently inside the flood storage compartment, as well as the amount of incoming flows and flows in downstream tributaries.

Wivenhoe's managers therefore have to decide on how much to let go in order to keep Wivenhoe ready for more rain and safe.

During a major flooding event the Bureau of Meteorology, the Water Grid, Seqwater (Wivenhoe and Somerset Dam operators) and local councils work together to formulate advice and instructions for the public and relevant Emergency Services on how to manage impending localised flooding.

The Bureau of Meteorology, Seqwater and local councils continually monitor rainfalls throughout all South East Queensland catchments during a flood event. The Bureau of Meteorology provides rainfall forecasts for Seqwater's dam operators monitoring the surrounding catchments.

Using this information, a comprehensive network of river height sensors and real time rainfall data across the Wivenhoe catchment, Seqwater is then able to formulate a schedule of controlled dam releases to ensure the safety and integrity of the dam wall is maintained, and maximum protection from flooding in urban areas is achieved.

Based on the Bureau's forecasts and predictions, as well as Seqwater's dam releases, South East Queensland local councils then begin alerting residents to road and bridge closures, as well as advising on the severity and flows of the impending flood event.

The following priorities are considered when determining how much water has to be let go, and how fast:

- ensuring the structural safety of the dam
- providing maximum protection from flooding for urbanised areas
- minimising disruption to rural industries along the Brisbane River and Stanley River valleys
- retaining the storage at Full Supply Level at the conclusion of a flood event
- minimising impacts to riparian flora and fauna during the water release phase of a flood event.

How to prepare for flooding?

In the event of flooding, the Bureau of Meteorology, working together with the Water Grid, bulk water authorities and local councils to ensure minimal impact downstream after any dam releases. For information on local flooding, contact your local council for flood information packs and advice.

Barry Dennien

From: Dan Spiller
Sent: Thursday, 23 December 2010 12:15 PM
To: Barry Dennien; Scott Denner; John Adcock
Subject: Fwd: Update
Attachments: Seqwater_No-Lifeguards-Here_email_strap.png; ATT00001.htm; cidimage001.png@01CA24E1.BDB90020; ATT00002.htm

For info

Begin forwarded message:

From: Rob Drury <rdrury@seqwater.com.au>
Date: 23 December 2010 11:37:08 AM GMT+10:00
To: Dan Spiller <Daniel.Spiller@seqwgm.com.au>
Cc: Mike Foster <mfoster@seqwater.com.au>, Jim Pruss <jpruss@seqwater.com.au>, Peter Borrows <pborrows@seqwater.com.au>
Subject: Update

Due to the rainfall last night and today and ongoing inflows, the strategy has been adjusted.

Instead of closing off totally this afternoon, gates will release at around 350m3/sec until tomorrow.

Councils are on board with this as it will give more security leading into the weekend but still allow the other bridges to come out of water as they isolate communities. It will keep Twin Bridges, Savages and Colleges Crossing out for longer.

I will send off another Report later this afternoon when the details have been worked out.

Rob

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater

Ph (07) 54278131 | Fax (07) 54261097 | M 0419378740 | E rdrury@seqwater.com.au

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306

Website | www.seqwater.com.au

Barry Dennien

From: Dan Spiller
Sent: Thursday, 23 December 2010 12:17 PM
To: Aleisha Coote
Cc: Barry Dennien; SEQWGM Communications Staff
Subject: Re: Channel 10

I am

On 23/12/2010, at 11:58 AM, "Aleisha Coote" <Aleisha.Coote@seqwgm.com.au> wrote:

> Hi Barry and Dan
>
> Are you guys happy with the wording below (signed off by Seqwater):
>
> Water released from Wivenhoe Dam generally takes around 24 - 36 hours to reach central Brisbane.
>
>
>
>
> Aleisha Coote
> Senior Media Advisor
> SEQ Water Grid Communications Unit
> Phone: (07) 3224 7212 | Fax: (07) 3405 0373
> Email: aleisha.coote@seqwgm.com.au
> Visit: Level 15, 53 Albert Street Brisbane
> Post: PO Box 16205, City East QLD 4002
> ABN: 14783 317 630
>
> Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.
>
>
>
>
> -----Original Message-----
> From: Paul Bird [mailto:pbird@seqwater.com.au]
> Sent: Thursday, 23 December 2010 11:57 AM
> To: Aleisha Coote; Mike Foster
> Cc: SEQWGM Communications Staff
> Subject: RE: Channel 10
>
> Hi Aleisha,
>
> Happy with that response,
>
> Paul
>
>
> -----Original Message-----
> From: Aleisha Coote [mailto:Aleisha.Coote@seqwgm.com.au]
> Sent: Thursday, 23 December 2010 11:54
> To: Mike Foster; Paul Bird
> Cc: SEQWGM Communications Staff
> Subject: FW: Channel 10
>

> Hi Mike and Paul
>
> Please note the email below from Channel 10, are you happy with the
> below response:
>
> Water released from Wivenhoe Dam generally takes around 24 - 36 hours
> to reach central Brisbane.
>
>
>
> Thanks
> Aleisha
>
> Aleisha Coote
> Senior Media Advisor
> SEQ Water Grid Communications Unit
> Phone: (07) 3224 7212 | Fax: (07) 3405 0373
> Email: aleisha.coote@seqwgm.com.au
> Visit: Level 15, 53 Albert Street Brisbane
> Post: PO Box 16205, City East QLD 4002
> ABN: 14783 317 630

> Please consider the environment before printing this email. It takes
> 10 litres of water to make one sheet of A4 paper.
>
>
>
> -----Original Message-----
> From: Sarah Horsley [mailto:Shorsley@networkten.com.au]
> Sent: Thursday, 23 December 2010 11:14 AM
> To: SEQWGM Media
> Subject: Hello there,
>
> Hello there,
> Sarah here from ten news. Just wondering how long it takes for water
> released from wivenhoe to reach hamilton section of brisbane river - 1
> -
> 3 days??
>
> Network Ten Pty Ltd ABN 91 052 515 250
>
> Network Ten Disclaimer.
> This e-mail (including all attachments) is intended solely for the
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> reply e-mail, delete it from your system and destroy the copies.
> This e-mail is also subject to copyright. No part of it should be
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> viruses or other defects and may not be successfully replicated on
> other systems. We give no warranties in relation to these matters. If
> you have any doubts about the authenticity of an e-mail purportedly
> sent by us, please contact us immediately.
>
>
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> information. You understand that any privilege or confidentiality
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> have received this message in error. If received in error, you are
> asked to inform the sender as quickly as possible and delete this
> email and any copies of this from your computer system network.

> If not an intended recipient of this email, you must not copy,
> distribute or take any action(s) that relies on it; any form of
> disclosure, modification, distribution and/or publication of this
> email is also prohibited.
> While all care has been taken, the SEQ Water Grid Manager disclaims
> all liability for loss or damage to person or property arising from
> this message being infected by a computer virus or other contamination.
> Unless stated otherwise, this email represents only the views of the
> sender and not the views of the SEQ Water Grid Manager and/or the
> Queensland Government.
> ----------Safe
> Stamp----------
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> viruses.
> For more information regarding this service, please contact your
> service provider.
>
>
>
> Important information: This email and any attached information is
> intended only for the addressee and may contain confidential and/or
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> that any transmission, distribution, or other use of this information
> is strictly prohibited. The confidentiality attached to this email is not waived, lost
or destroyed by reasons of mistaken delivery to you. If you have received this email in
error please contact the sender immediately and delete the material from your email
system.
> QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).
>

Barry Dennien

From: Andrew Musgrave
Sent: Thursday, 23 December 2010 12:27 PM
To: Barry Dennien; Dan Spiller; Michael Lyons
Subject: FW: 32253 SEQWG Wivenhoe Fact Sheet A4 2pp 4
Attachments: 32253 SEQWG Wivenhoe Fact Sheet A4 2pp 4.pdf; ATT00001.htm

Amended version attached – I will bring you round a print out

Regards

AjM

Andrew Musgrave
Communications Officer
SEQ Water Grid Communications Unit
SEQ Water Grid Manager
Phone: (07) 3405 4990 | Fax: (07) 3405 0373
Email: andrew.musgrave@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

From: Joel Kooreman [mailto:joel@generatorjsa.com.au]
Sent: Thursday, 23 December 2010 12:23 PM
To: Andrew Musgrave
Cc: Jeremy Bews
Subject: 32253 SEQWG Wivenhoe Fact Sheet A4 2pp 4

Hi Andrew,

Here it is...
Thanks.

Cheers,
Joel

Joel Kooreman
Senior Designer

joel@generatorjsa.com.au

www.generatorjsa.com.au

4 Exhibition Street, Bowen Hills Q 4006
PO Box 1580, Fortitude Valley Q 4006
T +61 7 3854 1633 T +61 7 3854 1773 M 0431 420 797

GeneratorJSA

SEQ Water Grid

Wivenhoe and Somerset Dams

Providing water supply and flood control

A FEW FACTS

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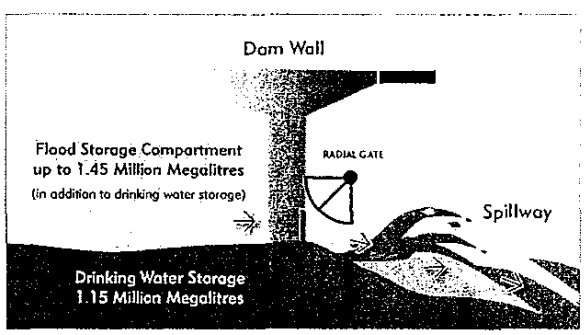

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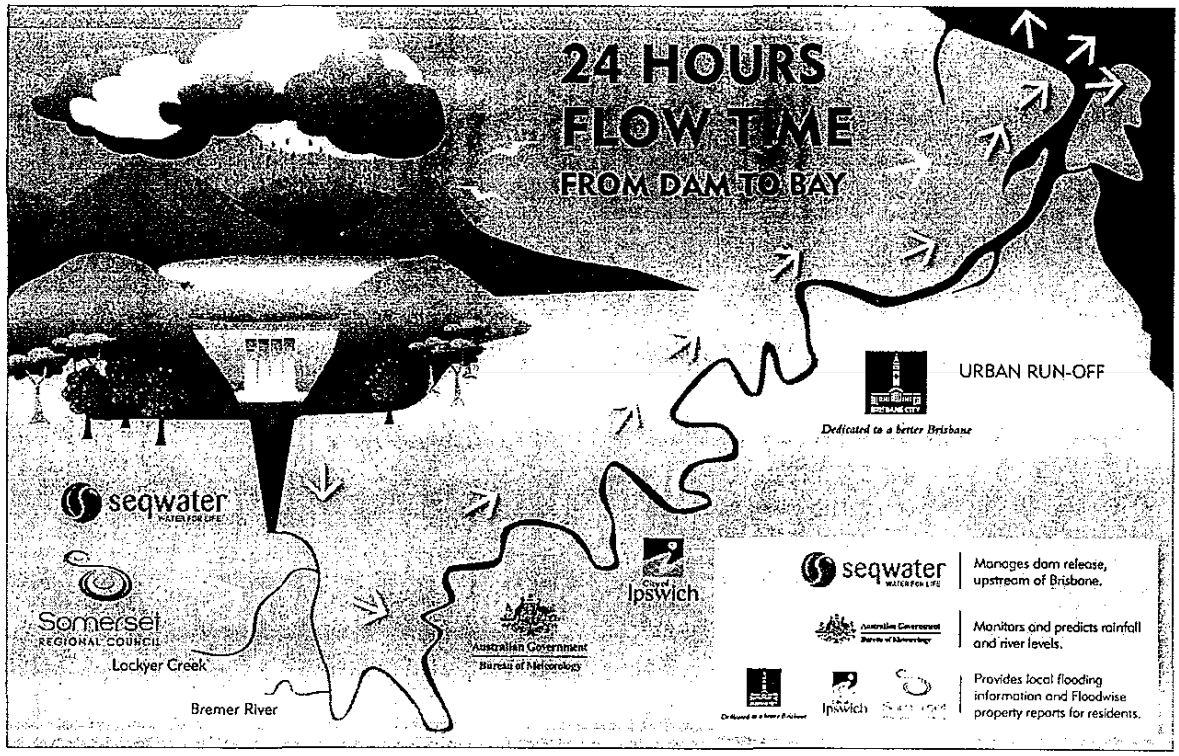
www.watergrid.com.au

seqwater LinkWater WaterSecure SEQ Water Grid



How are the releases managed?

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Barry Dennien

From: Barry Dennien
Sent: Thursday, 23 December 2010 12:40 PM
To: Michael Lyons; Rob Drury
Cc: John Adcock; Dan Spiller
Subject: Fwd: Update
Attachments: Seqwater_No-Lifeguards-Here_email_strap.png; ATT00001.htm; cidimage001.png@01CA24E1.BDB90020; ATT00002.htm

Mike rob

We have just sent out a media release that does not align with the latest strategy

Is there a set daily timeline for assessments or a process that ensures we appear on sync

Regards
Barry Dennien

Begin forwarded message:

> **From:** Dan Spiller <Daniel.Spiller@seqwgm.com.au>
> **Date:** 23 December 2010 12:14:56 PM AEST
> **To:** Barry Dennien <Barry.Dennien@seqwgm.com.au>, Scott Denner <Scott.Denner@seqwgm.com.au>, John Adcock <John.Adcock@seqwgm.com.au>
> **Subject: Fwd: Update**
>
> For info
>
> Begin forwarded message:
>
> > **From:** Rob Drury <rdrury@seqwater.com.au>
> > **Date:** 23 December 2010 11:37:08 AM GMT+10:00
> > **To:** Dan Spiller <Daniel.Spiller@seqwgm.com.au>
> > **Cc:** Mike Foster <mfoster@seqwater.com.au>, Jim Pruss <jpruss@seqwater.com.au>, Peter Borrows <pborrows@seqwater.com.au>
> > **Subject: Update**
> >
> > Due to the rainfall last night and today and ongoing inflows, the strategy has been adjusted.
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Rob

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater

Ph (07) 54278131 | Fax (07) 54261097 | M 0419378740 | E rdrury@seqwater.com.au

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306

Website | www.seqwater.com.au

Gina O'Driscoll

From: Bradley John [John.Bradley@derm.qld.gov.au]
Sent: Thursday, 23 December 2010 1:11 PM
To: Barry Dennien; Ken Smith
Subject: RE: Updated Wivenhoe fact sheet

Barry

Looks ok to me - key material on page 1, second column doesn't seem to come through strongly though....

I think it might be worthwhile to bold the section that says

As soon as Wivenhoe's flood storage compartment begins to fill, it has to be carefully emptied. This has to be done in order to make room in case another heavy rainfall event arrives quickly, as the compartment can fill in 3 days in heavy rain. Controlled Releases consider the following flood factors: catchment runoff below the dam wall, urban runoff and river levels.

We should point out that just recently during October 2010 the Dam received inflows equivalent to almost half the flood compartment capacity in just a few days

hn Bradley
rector-General
Department of Environment and Resource Management
Telephone: 07 3330 6298
Email: John.Bradley@derm.qld.gov.au
www.derm.qld.gov.au

Department of Environment and Resource Management
400 George Street, Brisbane Q 4000
GPO Box 2454, Brisbane Q 4001

From: Barry Dennien [mailto:Barry.Dennien@seqwgm.com.au]
Sent: Thursday, 23 December 2010 12:11 PM
To: Bradley John; Ken Smith
Subject: Updated Wivenhoe fact sheet

Ken / John

Any final thoughts, we would like to get this on the web tonight.

We have updated with facts from the talking point sheet yesterday

Regards

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
Phone: (07) 3033 0785 | **Fax:** (07) 3405 0373 | **Mobile:** 0419725708
Email: barry.dennien@seqwgm.com.au
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Barry Dennien

From: Barry Dennien
Sent: Thursday, 23 December 2010 1:46 PM
To: Dan Spiller; Aleisha Coote
Cc: SEQWGM Communications Staff
Subject: RE: Channel 10

24 hours is on our fact sheet

How about "on average 24hours"

-----Original Message-----
From: Dan Spiller
Sent: Thursday, 23 December 2010 12:17 PM
To: Aleisha Coote
Cc: Barry Dennien; SEQWGM Communications Staff
Subject: Re: Channel 10

am

On 23/12/2010, at 11:58 AM, "Aleisha Coote" <Aleisha.Coote@seqwgm.com.au> wrote:

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>
> Are you guys happy with the wording below (signed off by Seqwater):
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> Water released from Wivenhoe Dam generally takes around 24 - 36 hours
> to reach central Brisbane.
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>
>
> Aleisha Coote
> Senior Media Advisor
> SEQ Water Grid Communications Unit
> Phone: (07) 3224 7212 | Fax: (07) 3405 0373
> Email: aleisha.coote@seqwgm.com.au
> Visit: Level 15, 53 Albert Street Brisbane
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> ABN: 14783 317 630
>
> Please consider the environment before printing this email. It takes 10 litres of water
to make one sheet of A4 paper.
>
>
>
>
> -----Original Message-----
> From: Paul Bird [mailto:pbird@seqwater.com.au]
> Sent: Thursday, 23 December 2010 11:57 AM
> To: Aleisha Coote; Mike Foster
> Cc: SEQWGM Communications Staff
> Subject: RE: Channel 10
>
> Hi Aleisha,
>
> Happy with that response,

> Paul
>
>
> -----Original Message-----
> From: Aleisha Coote [mailto:Aleisha.Coote@seqwgm.com.au]
> Sent: Thursday, 23 December 2010 11:54
> To: Mike Foster; Paul Bird
> Cc: SEQWGM Communications Staff
> Subject: FW: Channel 10
>
> Hi Mike and Paul
>
> Please note the email below from Channel 10, are you happy with the
> below response:
>
> Water released from Wivenhoe Dam generally takes around 24 - 36 hours
> to reach central Brisbane.
>
>
>
> Thanks
> Aleisha
>
> Aleisha Coote
> Senior Media Advisor
> SEQ Water Grid Communications Unit
> Phone: (07) 3224 7212 | Fax: (07) 3405 0373
> Email: aleisha.coote@seqwgm.com.au
> Visit: Level 15, 53 Albert Street Brisbane
> Post: PO Box 16205, City East QLD 4002
> ABN: 14783 317 630
>
> Please consider the environment before printing this email. It takes
> 10 litres of water to make one sheet of A4 paper.
>
>
>
> -----Original Message-----
> From: Sarah Horsley [mailto:Shorsley@networkten.com.au]
> Sent: Thursday, 23 December 2010 11:14 AM
> To: SEQWGM Media
> Subject: Hello there,
>
> Hello there,
> Sarah here from ten news. Just wondering how long it takes for water
> released from wivenhoe to reach hamilton section of brisbane river - 1
> -
> 3 days??
>
> Network Ten Pty Ltd ABN 91 052 515 250
>
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> QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Barry Dennien

From: Aleisha Coote
Sent: Thursday, 23 December 2010 1:47 PM
To: Barry Dennien; Dan Spiller
Cc: SEQWGM Communications Staff
Subject: RE: Channel 10

Are you happy for me to change to fact sheet to read 24-36? -as this is the approved line from the guys at Seqwater

Aleisha Coote
Senior Media Advisor
SEQ Water Grid Communications Unit
Phone: (07) 3224 7212 | Fax: (07) 3405 0373
Email: aleisha.coote@seqwgm.com.au
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

-----Original Message-----
From: Barry Dennien
Sent: Thursday, 23 December 2010 1:46 PM
To: Dan Spiller; Aleisha Coote
Cc: SEQWGM Communications Staff
Subject: RE: Channel 10

24 hours is on our fact sheet

How about "on average 24hours"

-----Original Message-----
From: Dan Spiller
Sent: Thursday, 23 December 2010 12:17 PM
To: Aleisha Coote
Cc: Barry Dennien; SEQWGM Communications Staff
Subject: Re: Channel 10

I am

On 23/12/2010, at 11:58 AM, "Aleisha Coote" <Aleisha.Coote@seqwgm.com.au> wrote:

> Hi Barry and Dan
>
> Are you guys happy with the wording below (signed off by Seqwater):
>
> Water released from Wivenhoe Dam generally takes around 24 - 36 hours
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>

Barry Dennien

From: Barry Dennien
Sent: Thursday, 23 December 2010 1:48 PM
To: Aleisha Coote; Dan Spiller
Cc: SEQWGM Communications Staff
Subject: RE: Channel 10

OK

-----Original Message-----
From: Aleisha Coote
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>

Barry Dennien

From: Barry Dennien
Sent: Thursday, 23 December 2010 1:50 PM
To: Dan Spiller
Subject: RE: Brisbane City Council Community Service Announcement: Minor tidalflooding starting to occur in river

1.85m today!!!!!

From: Dan Spiller
Sent: Thursday, 23 December 2010 11:28 AM
To: Bradley John; ken.smith@premiers.qld.gov.au
Cc: Barry Dennien; Best Debbie; Tim Watts
Subject: FW: Brisbane City Council Community Service Announcement: Minor tidalflooding starting to occur in river

Ken and John,

The River has peaked at 1.95 m at the Port Office, up from 1.85 m yesterday (see http://www.bom.gov.au/fwo/IDQ65389/IDQ65389.540198.tbl.shtml).

Below is a media release issued by BCC communications team. They also provided us the attached image of Sandgate Road at the time of the peak. ..

Also attached is the latest Technical Situation Report. Gate closure commenced yesterday at 1600 and will be complete by 1500. Our current objective is to reopen local bridges for Christmas – providing respite for the 20 odd households that have been isolated and the others that are inconvenienced (as requested by the local Councils). Note that Lockyer Valley flows are increasing and may be sufficient to flood some of the lower crossings. If this occurs, we will review our release strategy in anticipation of further inflows.

Regards,

Dan

From: Lisa.M Martin [mailto:Lisa.M.Martin@brisbane.qld.gov.au]
Sent: Thursday, 23 December 2010 10:57 AM
To: Hunwick, Adrienne; Wilson, Alena; McNeil, Allan; Marshall, Amber; Buckwell, Andrew; Edwards, Belinda; Lawrence, Bethany; Wood, Brad; Walker, Brenda; Johnson, Bronwyn; Grace, Cassie; Coughlan, Cate; Chappell, Catherine; Nicholls, Chloe; Glanfield-Pook, Chris; Coomber, Christine; Salter, Christopher; Stevens, Craig; Harrison, Dana; Moody, David; McGhee, Eirin; Torcaso, Felicity; Archontoulis, Fiona; Longhurst, Freya; Kerr, Geoff.b; Foley, Gerry; Swain, Greg; Stevenson, Hannah; Kowaliauskas, Isis; Cooper, Jamie; Falconer, Jane; Flett, Jane; Hannan, Jess; Plowman, Jo; McGill, Joanne; Veraa, Joe; Ada, Joshua; Iles, Julia; Edwards, Karen; Murphy, Karen; Stepien, Kasia; Haddan, Kate; Keating, Katrina; Mather, Kimberley; deHesse, Kirsten; Booth, Krysten; Kerr, Lakshmi; Foster, Laura; Martin, Lisa.M; Dixon, Melissa; Nelson, Melissa; Forwood, Miranda; Talbot, Nerida; Pham, Nhi; Beveridge, Nic; O'Donnell, Nicholas; Gibson, Nicole; Shelley, Rosie; VonBayer, Sabrina; Cecchini, Samantha; Coffey, Sarah; Fox, Sarah; Wade, Sarah; Gibson, Scott; Graetz, Sonja; Spina, Steven; Leadbetter, Tanya; Doherty, Taryn; Whitelaw, Tracy; Parker, Victoria
Cc: Bell, Michael; Lavin, Chris; Logan, Craig; Oberto, Klynt
Subject: Fwd: Brisbane City Council Community Service Announcement: Minor tidalflooding starting to occur in river

FYI - this has just been distributed.

>>> "Media Release" <MediaRelease@Mediamonitors.com.au> 23/12/2010 10:53 am >>>
Minor tidal flooding is starting to occur in some areas of Brisbane due to higher than usual tides.

This morning's high tide has already had an impact on CityCat and CityFerry services with the Bulimba, Teneriffe and Hawthorne terminals and services now closed. All operating services are now running at reduced speeds and not to timetable. These service changes are expected to be in effect until approximately midday.

Minor tidal flooding is expected to occur on low-lying roads, bikeways and parks this morning in parts of the following suburbs as previously advised: Windsor, Albion, Bowen Hills, Newstead, East Brisbane, Woolloongabba, Teneriffe, Lota, Wynnum and Hemmant.

Sandbags are available if required.

Motorists are advised that roads affected by tidal flooding may be closed during and following the high tide peak.

-ENDS-

Barry Dennien

From: John Adcock
Sent: Thursday, 23 December 2010 2:01 PM
To: Barry Dennien
Cc: Shelley Banks; Aleisha Coote
Subject: FW: Update
Attachments: image001.jpg; image002.png

Latest info

From: Paul Bird [mailto:pbird@seqwater.com.au]
Sent: Thursday, 23 December 2010 2:00 PM
To: John Adcock
Cc: Mike Foster
Subject: RE: Update

John,

pdate is below. Please note time of update and bear in mind that the release strategy is ALWAYS dependant on ainfall and weather conditions.

Please add the following par into all future media releases:

As at (TIME & DATES) the following water releases are being made: Please note that the release strategy may changes according to weather conditions.

AS AT 3.00 PM THURSDAY 23 DECEMBER, THE FOLLOWING WATER RELEASES ARE BEING MADE:

WIVENHOE DAM:
WIVENHOE CONTINUES TO DISCHARGE AROUND 30,000 MEGALITRES THROUGH ONE GATE, WHICH IS EXPECTED TO REMAIN OPEN UNTIL THE AFTERNOON OF 24 DECEMBER.
INCREASED INFLOWS FROM OVERNIGHT RAIN HAVE MEANT LEVELS HAVE NOT DROPPED AS QUICKLY AS EXPECTED.

COUNCILS HAVE BEEN CONSULTED AND ARE AWARE THAT THE RELEASES FROM WIVENHOE DAM HAVE RESULTED 'N ELEVATED LEVELS IN THE BRISBANE RIVER DOWNSTREAM TO COLLEGES CROSSING.

WIN BRIDGES, SAVAGES CROSSING, COLLEGES CROSSING, BURTONS BRIDGE AND KHOLO BRIDGE ARE CURRENTLY ALL CLOSED DUE TO INUNDATION RESULTING FROM THESE RELEASES, COMBINED WITH INCREASED WATER LEVELS DUE TO RAINFALL.

KHOLO BRIDGE AND BURTONS BRIDGE ARE EXPECTED TO RE-OPEN TO TRAFFIC BY THE EVENING OF 23 DECEMBER THE REDUCTION IN RELEASE VOLUMES.

THE REMAINING BRIDGES WILL REMAIN CLOSED UNTIL AT LEAST CHRISTMAS DAY.

SOMERSET DAM:
THE SLUICE GATES WERE CLOSED AT AROUND 9:00AM THURSDAY 23 DECEMBER. A VALVE MAY BE USED TO MAINTAIN THE LAKE LEVEL NEAR FULL SUPPLY LEVEL. HOWEVER, IF FORECAST RAINFALL RESULTS IN RIVER RISES, IT MAY BE NECESSARY TO RE-OPEN THE GATES.

NORTH PINE DAM:
NORTH PINE GATES WERE CLOSED AT 5.00 AM TUESDAY 21 DECEMBER . YOUNGS CROSSING IS OPEN. LEVELS ARE BEING MONITORED AND FURTHER RAINFALL MAY RESULT IN OVERNIGHT RELEASES.

LESLIE HARRISON DAM:

NO RELEASES

HINZE DAM:
NO RELEASES

FOR DETAILED INFORMATION ON ROAD CROSSING CLOSURES AND OTHER POTENTIAL IMPACTS, ALWAYS CONTACT YOUR LOCAL COUNCIL.

RECREATION UPDATE:
WHILE EVERY EFFORT WILL BE MADE TO KEEP RECREATIONAL SITES OPEN, PUBLIC SAFETY IS PARAMOUNT AND IT IS POSSIBLE THAT SOME SITES MAY BE CLOSED AT SHORT NOTICE DUE TO HEAVY WEATHER.

THEREFORE, MEMBERS OF THE PUBLIC WHO ARE CONSIDERING RECREATIONAL ACTIVITIES, INCLUDING CAMPING, AT SOUTH EAST QUEENSLAND DAMS OVER THE CHRISTMAS/NEW YEAR PERIOD ARE URGED TO EXPLORE OTHER OPTIONS.

CURRENTLY, SOMERSET DAM HAS BEEN RE-OPENED FOR ALL WATER-BASED RECREATIONAL ACTIVITIES, HOWEVER THIS MAY CHANGE AT SHORT NOTICE.

LIKEWISE, WIVENHOE DAM HAS ALSO BEEN REOPENED FOR ALL PERMITTED WATER-BASED RECREATIONAL ACTIVITIES; HOWEVER THE FOLLOWING RECREATION SITES AT WIVENHOE REMAIN CLOSED:

- RIVER ACCESS AT ATKINSONS CROSSING
- BILLIES BAY

ALL OTHER RECREATIONAL SITES HAVE REOPENED, HOWEVER SOME CAMPING GROUNDS ARE FULLY BOOKED.

THIS INFORMATION WILL BE UPDATED DURING THE MORNING OF 24 DECEMBER OR IF ANY SIGNIFICANT CHANGES OCCUR.

From: John Adcock [mailto:John.Adcock@seqwgm.com.au]
Sent: Thursday, 23 December 2010 13:40
To: Mike Foster; Paul Bird
Cc: Rob Drury
Subject: RE: Update
Importance: High

Thanks Mike

As a heads up – River 94 are doing news grabs at 2.15pm with Barry so getting this information by 2pm will work well for this as well.

Many thanks for your great efforts

Cheers
John

From: Mike Foster [mailto:mfoster@seqwater.com.au]
Sent: Thursday, 23 December 2010 1:27 PM
To: Paul Bird

Cc: Rob Drury; John Adcock
Subject: FW: Update

Gents,

Barry D is doing media at 2.30pm (Ch 7/10)

Paul can you check with Rob and confirm actions this afternoon

Also can you check that the recreation update as of this morning remains relevant.

Just dot points to John D will suffice.

I have said we will try and get them Grid by 2pm

Cheers Mike

'om: Rob Drury
ent: Thursday, 23 December 2010 11:37 AM
To: 'Dan Spiller'
Cc: Mike Foster; Jim Pruss; Peter Borrows
Subject: Update

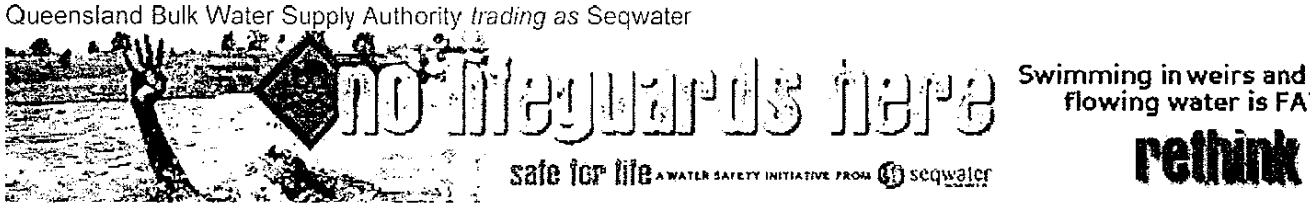
Due to the rainfall last night and today and ongoing inflows, the strategy has been adjusted.

Instead of closing off totally this afternoon, gates will release at around 350m3/sec until tomorrow.
Councils are on board with this as it will give more security leading into the weekend but still allow the other bridges to come out of water as they isolate communities. It will keep Twin Bridges, Savages and Colleges Crossing out for longer.

I will send off another Report later this afternoon when the details have been worked out.

Rob

:obert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

Ph (07) 54278131 | Fax (07) 54261097 | M 0419378740 | E rdrury@seqwater.com.au
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

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Gina O'Driscoll

From: Paul Bird [pbird@seqwater.com.au]
Sent: Thursday, 23 December 2010 2:03 PM
To: SEQWGM Media; aroebuck@ipswich.qld.gov.au; greg.swain@brisbane.qld.gov.au; GSTUBBS@goldcoast.qld.gov.au; lisa.m.martin@brisbane.qld.gov.au; tjacobs@somerset.qld.gov.au
Cc: Mike Foster; Michael Lyons; Reception; Tara King; Michael Fiechtner; Arminda Roberts; Peter Borrows; Jim Pruss; Bill Andrew; Barry Dennien; Dan Spiller; Scott Denner
Subject: Afternoon Update

AS AT 3.00 PM THURSDAY 23 DECEMBER, THE FOLLOWING WATER RELEASES ARE BEING MADE:

WIVENHOE DAM:
WIVENHOE CONTINUES TO DISCHARGE AROUND 30,000 MEGALITRES THROUGH ONE GATE, WHICH IS EXPECTED TO REMAIN OPEN UNTIL THE AFTERNOON OF 24 DECEMBER.
INCREASED INFLOWS FROM OVERNIGHT RAIN HAVE MEANT LEVELS HAVE NOT DROPPED AS QUICKLY AS EXPECTED.

COUNCILS HAVE BEEN CONSULTED AND ARE AWARE THAT THE RELEASES FROM WIVENHOE DAM HAVE RESULTED IN ELEVATED LEVELS IN THE BRISBANE RIVER DOWNSTREAM TO COLLEGES CROSSING.

TWIN BRIDGES, SAVAGES CROSSING, COLLEGES CROSSING, BURTONS BRIDGE AND KHOLO BRIDGE ARE CURRENTLY ALL CLOSED DUE TO INUNDATION RESULTING FROM THESE RELEASES, COMBINED WITH INCREASED WATER LEVELS DUE TO RAINFALL.

KHOLO BRIDGE AND BURTONS BRIDGE ARE EXPECTED TO RE-OPEN TO TRAFFIC BY THE EVENING OF 23 DECEMBER THE REDUCTION IN RELEASE VOLUMES.

THE REMAINING BRIDGES WILL REMAIN CLOSED UNTIL AT LEAST CHRISTMAS DAY.

SOMERSET DAM:
THE SLUICE GATES WERE CLOSED AT AROUND 9:00AM THURSDAY 23 DECEMBER. A VALVE MAY BE USED TO MAINTAIN THE LAKE LEVEL NEAR FULL SUPPLY LEVEL. HOWEVER, IF FORECAST RAINFALL RESULTS IN RIVER RISES, IT MAY BE NECESSARY TO RE-OPEN THE GATES.

NORTH PINE DAM:
NORTH PINE GATES WERE CLOSED AT 5.00 AM TUESDAY 21 DECEMBER . YOUNGS CROSSING IS OPEN. LEVELS ARE BEING MONITORED AND FURTHER RAINFALL MAY RESULT IN OVERNIGHT RELEASES.

LESLIE HARRISON DAM:
NO RELEASES

HINZE DAM:
NO RELEASES

RECREATION UPDATE:
WHILE EVERY EFFORT WILL BE MADE TO KEEP RECREATIONAL SITES OPEN, PUBLIC SAFETY IS PARAMOUNT AND IT IS POSSIBLE THAT SOME SITES MAY BE CLOSED AT SHORT NOTICE DUE TO HEAVY WEATHER.

THEREFORE, MEMBERS OF THE PUBLIC WHO ARE CONSIDERING RECREATIONAL ACTIVITIES, INCLUDING CAMPING, AT SOUTH EAST QUEENSLAND DAMS OVER THE CHRISTMAS/NEW YEAR PERIOD ARE URGED TO EXPLORE OTHER OPTIONS.

CURRENTLY, SOMERSET DAM HAS BEEN RE-OPENED FOR ALL WATER-BASED RECREATIONAL ACTIVITIES, HOWEVER THIS MAY CHANGE AT SHORT NOTICE.

LIKEWISE, WIVENHOE DAM HAS ALSO BEEN REOPENED FOR ALL PERMITTED WATER-BASED RECREATIONAL ACTIVITIES; HOWEVER THE FOLLOWING RECREATION SITES AT WIVENHOE REMAIN CLOSED:

- RIVER ACCESS AT ATKINSONS CROSSING
- BILLIES BAY

ALL OTHER RECREATIONAL SITES HAVE REOPENED, HOWEVER SOME CAMPING GROUNDS ARE FULLY BOOKED.

Paul Bird
Senior Communications Advisor
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

P 07 3035 5519 M 0409 111 870 E pbird@seqwater.com.au
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

Barry Dennien

From: Mike Foster [mfoster@seqwater.com.au]
Sent: Thursday, 23 December 2010 2:13 PM
To: Barry Dennien; Rob Drury; Dan Spiller
Cc: John Adcock; Paul Bird
Subject: FW: Update
Attachments: Seqwater_No-Lifeguards-Here_email_strap.png; ATT00001.htm; cidimage001.png@01CA24E1.BDB90020; ATT00002.htm

Barry

Have spoken to John D on the below.

The communication information provided this morning at 8.16am was accurate and reflected the release strategy.

The Grid release did not go out until 10.50am. At that stage Operations had not yet decided on any change strategy but were monitoring conditions. At this stage it may well have been the afternoon before any decision to change releases was made.

However by 11.30am Operations, inconjunction with the BOM and noting the renewed flows down the Lockyer, decided to adjust the release strategy.

Given we are moving into a space where release strategy may well change during the day suggest we now include the following line in all future media releases.

As at (TIME & DATES) the following water releases are being made: Please note that the release strategy may change according to weather conditions.

Cheers Mike

From: Barry Dennien
Sent: Thursday, 23 December 2010 12:40 PM
To: Michael Lyons; Rob Drury
Cc: John Adcock; Dan Spiller
Subject: Fwd: Update

Mike rob

We have just sent out a media release that does not align with the latest strategy

Is there a set daily timeline for assessments or a process that ensures we appear on sync

Regards
Barry Dennien

Begin forwarded message:

> **From:** Dan Spiller <Daniel.Spiller@seqwgm.com.au>
> **Date:** 23 December 2010 12:14:56 PM AEST
> **To:** Barry Dennien <Barry.Dennien@seqwgm.com.au>, Scott Denner <Scott.Denner@seqwgm.com.au>, John Adcock <John.Adcock@seqwgm.com.au>
> **Subject: Fwd: Update**

For info

Begin forwarded message:

From: Rob Drury <rdrury@seqwater.com.au>
Date: 23 December 2010 11:37:08 AM GMT+10:00
To: Dan Spiller <Daniel.Spiller@seqwgm.com.au>
Cc: Mike Foster <mfoster@seqwater.com.au>, Jim Pruss <jpruss@seqwater.com.au>, Peter Borrows <pborrows@seqwater.com.au>
Subject: Update

Due to the rainfall last night and today and ongoing inflows, the strategy has been adjusted.

Instead of closing off totally this afternoon, gates will release at around 350m3/sec until tomorrow.

Councils are on board with this as it will give more security leading into the weekend but still allow the other bridges to come out of water as they isolate communities. It will keep Twin Bridges, Savages and Colleges Crossing out for longer.

I will send off another Report later this afternoon when the details have been worked out.

Rob

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater

Ph (07) 54278131 | Fax (07) 54261097 | M 0419378740 | E rdrury@seqwater.com.au

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306

Website | www.seqwater.com.au

Barry Dennien

From: Barry Dennien
Sent: Thursday, 23 December 2010 2:44 PM
To: 'Mike Foster'; Rob Drury; Dan Spiller
Cc: John Adcock; Paul Bird
Subject: RE: Update

Thanks Mike don't mean to be pushy I am just interested in giving a "calm, in control, consistent" message for all of us.

One audience is getting more sophisticated with the understanding of flood releases, one might argue if the lockyer is flowing more we should be shutting down releases and that we already knew about the forecast rain.

Moving on, Dan and Rob are designing a process to have assumptions and strategies clearly articulated in the Technical reports.

ood job all round to date

Baz

From: Mike Foster [mailto:mfoster@seqwater.com.au]
Sent: Thursday, 23 December 2010 2:13 PM
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Cc: John Adcock; Paul Bird
Subject: FW: Update

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Cc: John Adcock; Dan Spiller
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>
> For info
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> > **Cc:** Mike Foster <mfoster@seqwater.com.au>, Jim Pruss <jpruss@seqwater.com.au>, Peter Borrows <pborrows@seqwater.com.au>
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> >
> > Rob

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater

Gina O'Driscoll

From: Dan Spiller
Sent: Thursday, 23 December 2010 2:44 PM
To: steve.armstrong@derm.qld.gov.au
Cc: Best Debbie; Barry Dennien
Subject: FW: Brisbane residents sandbagging against localised floods
Attachments: information brief - DG - Meeting of the State Disaster Management Committee.doc

Steve,

As requested.

Dan

From: Bradley John [mailto:John.Bradley@derm.qld.gov.au]
Sent: Wednesday, 22 December 2010 1:35 PM
To: Armstrong Steve
Cc: Dan Spiller; Brown Damien; Leverington Andrea; Wall Terry; Barry Dennien; Best Debbie; Ellwood Dean
Subject: RE: Brisbane residents sandbagging against localised floods

Steve

Can you pls pull together **for 4.00 or 5.00pm tomorrow** a DERM portfolio SITREP discussion in advance of SDMG on Friday to run through latest on key issues.

We will need attendees at least as above....

My starting point for agenda is below but happy for others to add to it.

- Mines Preparation **(Terry/Damien)**
  - CQ Mines - TEP approvals etc
  - NW Mines - Current Status / Imminent Risks (Gulf System, etc)
- SEQ Flood Risk Management **(Barry/Dan)**
  - (Dam releases etc)
- Other regional Dam release issues (if any worth discussing, if not remove) - **Terry / OWSR**
- QPWS preparation **(Andrea)**

Intent would be to get a one pager or key SITREPs on each topic. Key focus should be on

- Current Status/Risk
- Incident management readiness
- Resource Availability and On Call arrangements if needed – eg. processing permits/approvals.

thanks alot

John Bradley
Director-General
Department of Environment and Resource Management
Telephone: 07 3330 6298
Email: John.Bradley@derm.qld.gov.au
www.derm.qld.gov.au

Department of Environment and Resource Management
400 George Street, Brisbane Q 4000
GPO Box 2454, Brisbane Q 4001

From: Barry Dennien [mailto:Barry.Dennien@seqwgm.com.au]
Sent: Wednesday, 22 December 2010 1:13 PM
To: Ken Smith; Bradley John
Cc: spiller daniel @ SEQWGM
Subject: RE: Brisbane residents sandbagging against localised floods

Ken

Current release rate is 110,000 megalitres per day (1300 cubic meters per second) October releases were at a maximum of 1500 cubic meters per second. These are expected to continue until tomorrow and then cut back over the xmas break. However the variable in all of this is the rain forecast. Wivenhoe is at 106% and we are targeting 100% by tomorrow allowing for inflows still coming .

The forecast could change in the coming days with the low forming off the Mid East Coast of Queensland, getting the dam back to 100% is critical in case the rain event escalates.

The tide peaked today at 1.85m and tomorrow and Friday will peak slightly higher than at 1.95m this is higher than October 1.66m peak. Then the tides will start to decrease.

We remain in close communication with the BOM and BCC. The protocol is being followed.

Regards

Barry

From: Ken Smith [mailto:Ken.Smith@premiers.qld.gov.au]
Sent: Wednesday, 22 December 2010 12:53 PM
To: John Bradley (JOhn.Bradley@derm.qld.gov.au); Barry Dennien
Subject: FW: Brisbane residents sandbagging against localised floods

John and Barry

Some very localised flooding. What are the current release levels from Wivenhoe?

Regards

Ken Smith
Director-General
Department of the Premier and Cabinet

Phone: 07 322 44728 Fax: 3229 2049
Mobile: 0417 730 013
Email: Ken.Smith@premiers.qld.gov.au

Tomorrow's Queensland: strong, green, smart, healthy and fair - www.towardQ2.qld.gov.au

Please consider the environment before printing this email (3 sheets of paper = 1 litre of water)

From: Kimberley Gardiner [mailto:Kimberley.Gardiner@ministerial.qld.gov.au]
Sent: Wednesday, 22 December 2010 12:41 PM
To: Anna Bligh; Premiers Office - Media Unit; Stephen Beckett; Melissa Patch; Adam Shortman

Cc: Ken Smith
Subject: Brisbane residents sandbagging against localised floods

Brisbane residents sandbagging against localised floods

By Stephanie Smail ABC News

Posted 11 minutes ago

- Map: Brisbane 4000

Tidal flooding has inundated some suburbs along the Brisbane River this morning.

Days of heavy rain, storm run-off and releases from the Wivenhoe Dam, north of Ipswich, have raised river levels.

There is minor flooding in suburbs including Windsor, Albion and Newstead.

The Brisbane City Council says some sandbagging is underway but the water levels are already dropping.

Kimberley Gardiner
Director, Government Media Unit
Office of the Premier of Queensland
P 07 3225 1610
M 0457 808 559
E kimberley.gardiner@ministerial.qld.gov.au

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+------------------------------------------------------------------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+------------------------------------------------------------------+
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SEQ Water Grid

Information Brief

TRIM reference: D/10/8082	Enquiry received: 22 December 2010

Purpose: Information Brief for DG - Meeting of the State Disaster Management Committee

SEQ Flood Risk Management

Current status

- Wivenhoe Dam is near full supply level, with about 1.45 megalitres of flood storage compartment available. A major flood would be managed in accordance with approved Wivenhoe Dam flood management plans.
- One of five gates remains open. Without further rainfall, it is likely to close tomorrow.
- Efforts are being made to ensure that Burtons and Kholo Bridges are accessible from the evening of the 23 December 2010, providing respite to residents who have been isolated by releases over previous weeks (approximately 19 families).
- Gate operations over the remainder of the Christmas period will depend on rainfall and inflows. At a minimum, operational releases will continue via cone valves.

Actions

- A draft protocol has been developed with Councils and the Bureau of Meteorology. The Water Grid is operating in accordance with this draft protocol, which has not yet been approved by Councils.
- Technical Situation Reports are being prepared daily, following consultation with Councils. Reports summarise operational actions. Report will continue to be prepared and distributed while gates are open.
- Daily media updates are being provided. Updates will be provided over Christmas only if the status changes.
- Communication messages are being aligned with Councils, to ensure consistency of messaging for releases and related impacts. The Water Grid has met all council requests for support, including daily briefings and provision of information.
- Releases continue to impact on some residents and holiday makers, through closure of roads and recreational areas.
- The Water Grid has established a phone service (1800 613 122) to provide updates on dam releases. The recorded message is updated by 9.00 am and 3.00 pm daily.
- Closure of Council-owned roads is a Council responsibility. Roads may be closed for a range of reasons aside from flooding, and may not be trafficable immediately after inundation.
- The Water Grid Manager is working with Somerset Regional Council to ensure that residents who may be isolated are proactively notified.
- Community service announcements are being run through radio and print mediums. The announcements explain how to find out more information about releases, recreational impacts and local roads. The announcements will be run from 23 December 2010 to 3 January 2011.

Gina O'Driscoll

From: Dan Spiller
Sent: Thursday, 23 December 2010 3:00 PM
To: Barry Dennien; John Adcock; Scott Denner
Subject: FW: Technical Report W17
Attachments: Technical Stuation Report W17.docx

From: Rob Drury [mailto:rdrury@seqwater.com.au]
Sent: Thursday, 23 December 2010 2:55 PM
To: Dan Spiller
Cc: Peter Borrows; Mike Foster; Paul Bird; Jim Pruss; Alex Fisher; Helen Moore; Bill Andrew
Subject: Technical Report W17

Dan,
Attached report with updated strategy as per my earlier heads up.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

Ph (07) 54278131 | Fax (07) 54261097 | M 0419378740 | E rdrury@seqwater.com.au
Jivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

TECHNICAL SITUATION REPORT

TSR Number	W17	Date of TSR release	23.12.2010	Time of TSR release	2.30pm

Seqwater status of inflows and dam operations

Somerset/Wivenhoe Dams

Somerset Dam

Sluice gate operations ceased at 09:00 today with the lake level at 99.10 m AHD. Base flows will result in the lake level rising over the next few days.

Further gate operations may be necessary in coming days if forecast rainfall results in subsequent river rises.

Wivenhoe Dam

Wivenhoe Dam is currently discharging around 350 m^3/s with Gate 3 open 3.5 m. The scheduled cessation of gate operations at Wivenhoe Dam has been extended until tomorrow afternoon (Friday 24 December 2010) with a target of 1.00pm as base flows and the overnight rain has meant the lake level has not dropped as quickly as anticipated. The current lake level is 67.23 m AHD.

Continued gate operations may be necessary if forecast rainfall results in subsequent river rises. The gate closure sequence will be reviewed throughout today and discussions with impacted Local Authorities will be ongoing.

Impact of Wivenhoe Dam Releases

The releases from Wivenhoe Dam have resulted in elevated levels in the Brisbane River downstream to Colleges Crossing. Twin Bridges, Savages Crossing, Colleges Crossing, Burtons Bridge and Kholo Bridge are currently all closed due to inundation resulting from these releases. In accordance with the current operational strategy Kholo Bridge and Burtons Bridge should be trafficable by this evening.

Projected "early side" times for bridges becoming clear of water based on the current gate closure sequence and concurrent Lockyer Creek flows are as follows:-

Burtons Bridge – 18:00 Thursday 23 December 2010.
Kholo Bridge – 21:00 Thursday 23 December 2010.

The remaining bridges will most likely remain closed until Christmas Day.

Rainfall

There have been falls of between 10 and 30 mm in the catchments over the last 24 hours. This has led to small rises in the Stanley, Pine, Lockyer and Bremer Rivers. The Lockyer Creek flow is likely to impact the middle-Brisbane River tomorrow and this may prevent the opening of Savages Crossing and Colleges Crossing.

Rainfall across the region is expected to increase up to 06:00 on 25 December 2010 before easing and further heavy rainfall may commence late on 29 December 2010.

Tide levels continue to be monitored closely with peak tide estimates being adjusted by BOM to account for Wivenhoe Dam outflows.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
0410378740	0419378740

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	0414 501 398

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	0417 620 225

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	0409627313

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**		**Time**		**or Event**	Closure

Barry Dennien

From: Shelley Banks
Sent: Thursday, 23 December 2010 3:20 PM
To: Barry Dennien
Cc: Dan Spiller
Subject: FW: Media Alert - Dam Releases
Attachments: image001.gif

Hi Barry

Afternoon update below. Please advise if you are happy for this to be issued. Seqwater has approved.

Shelley

23 December 2010 - Afternoon

Media update: Dam releases

As at 3pm today the following water releases are being made: Please note that the release strategy may change according to weather conditions.

One gate at Wivenhoe Dam is still open as a result of increased inflows from overnight rain. Around 30 000 megalitres is being released through this gate and it is expected that it will be open until tomorrow afternoon. The other four gates commenced closing at 4pm yesterday.

Local councils have been consulted regarding the re-opening of the major downstream crossings and it is expected that Kholo Bridge and Burtons Bridge will be open to traffic this evening. Twin Bridges, Savages Crossing and Colleges Crossing are expected to remain closed until at least Christmas Day.

Members of the public seeking information on potential impacts in their local areas, including road closures, should direct inquiries to their local councils.

The gates at Somerset Dam were closed at around 9am this morning.

Further rainfall and inflows may result in overnight gate openings at North Pine Dam. Council will be consulted ahead any gate openings.

For recorded information on current dam releases in South East Queensland, members of the public are encouraged to call **1800 613 122**.

Recreation update

Wivenhoe and Somerset dams are open for all water-based recreational activities, however this may change at short notice depending on weather.

The following recreation sites at Wivenhoe Dam remain closed:

- Billies Bay
- River access at Atkinsons Crossing

All other recreational sites have reopened however this status could change due to weather.

While every effort will be made to keep recreational sites open, public safety is paramount and it is possible that some sites may be closed at short notice due to poor weather.

Members of the public who are considering recreational activities, including camping, at South East Queensland dams over the Christmas/New Year period are urged to consider alternative arrangements.

PLEASE NOTE: Conditions will be extremely dangerous as flood conditions exist in some areas.

For further information on the Water Grid: www.watergrid.com.au

ENDS

Notes to the editor

About the SEQ Water Grid

Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further details contact the SEQ Water Grid Communications Unit on:
Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Barry Dennien

From: Dan Spiller
Sent: Thursday, 23 December 2010 3:24 PM
To: Shelley Banks; Barry Dennien
Subject: RE: Media Alert - Dam Releases
Attachments: image001.gif

The order did not work for me. How about this version?

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Cc: Dan Spiller
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Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Gina O'Driscoll

From: SEQWGM Media
Sent: Thursday, 23 December 2010 3:37 PM
Subject: Media Alert - Dam Releases

23 December 2010 - Afternoon

Media update: Dam releases

As at 3pm today the following water releases are being made: Please note that the release strategy is continually being updated based on weather conditions.

Four of the five gates at Wivenhoe Dam are now closed. One gate is still open as a result of the forecast of increasing rain tomorrow. Around 30 000 megalitres is being released through this gate and it is expected that this will be reassessed tomorrow.

It is expected that Kholo Bridge and Burtons Bridge will be open to traffic this evening. Twin Bridges, Savages Crossing and Colleges Crossing are expected to remain closed until at least Christmas Day. Local councils have been consulted regarding the re-opening of the major downstream crossings.

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Barry Dennien

From: Dan Spiller
Sent: Thursday, 23 December 2010 3:41 PM
To: Stephen.Robertson@ministrial.qld.gov.au; Bradley John; Best Debbie; Tim.Watts@ministerial.qld.gov.au; Lance.McCallum@ministerial.qld.gov.au; Geoff.Stead@ministerial.qld.gov.au; Lauren.Sims@ministerial.qld.gov.au
Cc: Barry Dennien; Mike Foster; Rob Drury
Subject: SEQ dam releases: Technical Situation Report
Attachments: Technical Stuation Report W17.docx

All,

For information, this afternoon's:

- Technical Situation Report is attached
- Media update is below.

Please contact me if you require any further information.

Cards,
Dan

23 December 2010 - Afternoon

Media update: Dam releases

As at 3pm today the following water releases are being made: Please note that the release strategy is continually being updated based on weather conditions.

Four of the five gates at Wivenhoe Dam are now closed. One gate is still open as a result of the forecast of increasing rain tomorrow. Around 30 000 megalitres is being released through this gate and it is expected that this will be reassessed tomorrow.

It is expected that Kholo Bridge and Burtons Bridge will be open to traffic this evening. Twin Bridges, Savages Crossing and Colleges Crossing are expected to remain closed until at least Christmas Day. Local councils have been consulted regarding the re-opening of the major downstream crossings.

Members of the public seeking information on potential impacts in their local areas, including road closures, should direct inquiries to their local councils.

The gates at Somerset Dam were closed at around 9am this morning.

Further rainfall and inflows may result in overnight gate openings at North Pine Dam. Council will be consulted ahead any gate openings.

For recorded information on current dam releases in South East Queensland, members of the public are encouraged to call **1800 613 122**.

Recreation update

Wivenhoe and Somerset dams are open for all water-based recreational activities, however this may change at short notice depending on weather.

The following recreation sites at Wivenhoe Dam remain closed:

- Billies Bay
- River access at Atkinsons Crossing

All other recreational sites have reopened however this status could change due to weather.

While every effort will be made to keep recreational sites open, public safety is paramount and it is possible that some sites may be closed at short notice due to poor weather.

Members of the public who are considering recreational activities, including camping, at South East Queensland dams over the Christmas/New Year period are urged to consider alternative arrangements.

PLEASE NOTE: Conditions will be extremely dangerous as flood conditions exist in some areas.

For further information on the Water Grid: www.watergrid.com.au

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
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ABN: 14783 317 630

TECHNICAL SITUATION REPORT

TSR Number	W17	Date of TSR release	23.12.2010	Time of TSR release	2.30pm

Seqwater status of inflows and dam operations

Somerset/Wivenhoe Dams

Somerset Dam

Sluice gate operations ceased at 09:00 today with the lake level at 99.10 m AHD. Base flows will result in the lake level rising over the next few days.

Further gate operations may be necessary in coming days if forecast rainfall results in subsequent river rises.

Wivenhoe Dam

Wivenhoe Dam is currently discharging around 350 m^3/s with Gate 3 open 3.5 m. The scheduled cessation of gate operations at Wivenhoe Dam has been extended until tomorrow afternoon (Friday 24 December 2010) with a target of 1.00pm as base flows and the overnight rain has meant the lake level has not dropped as quickly as anticipated. The current lake level is 67.23 m AHD.

Continued gate operations may be necessary if forecast rainfall results in subsequent river rises. The gate closure sequence will be reviewed throughout today and discussions with impacted Local Authorities will be ongoing.

Impact of Wivenhoe Dam Releases

The releases from Wivenhoe Dam have resulted in elevated levels in the Brisbane River downstream to Colleges Crossing. Twin Bridges, Savages Crossing, Colleges Crossing, Burtons Bridge and Kholo Bridge are currently all closed due to inundation resulting from these releases. In accordance with the current operational strategy Kholo Bridge and Burtons Bridge should be trafficable by this evening.

Projected "early side" times for bridges becoming clear of water based on the current gate closure sequence and concurrent Lockyer Creek flows are as follows:-

Burtons Bridge – 18:00 Thursday 23 December 2010.
Kholo Bridge – 21:00 Thursday 23 December 2010.

The remaining bridges will most likely remain closed until Christmas Day.

Rainfall

There have been falls of between 10 and 30 mm in the catchments over the last 24 hours. This has led to small rises in the Stanley, Pine, Lockyer and Bremer Rivers. The Lockyer Creek flow is likely to impact the middle-Brisbane River tomorrow and this may prevent the opening of Savages Crossing and Colleges Crossing.

Rainfall across the region is expected to increase up to 06:00 on 25 December 2010 before easing and further heavy rainfall may commence late on 29 December 2010.

Tide levels continue to be monitored closely with peak tide estimates being adjusted by BOM to account for Wivenhoe Dam outflows.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
0410378740	0419378740

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	0414 501 398

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	0417 620 225

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	0409627313

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**		**Time**		**or Event**	Closure

Gina O'Driscoll

Subject: DERM Portfolio SITREP: flooding issues
Location: DG's Boardroom

Start: Thu 23/12/2010 4:00 PM
End: Thu 23/12/2010 5:00 PM

Recurrence: (none)

Meeting Status: Accepted

Organizer: Bradley John

Categories: Important

<<RE: Brisbane residents sandbagging against localised floods>>
As per DG's email.

anks
nette

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+----------+

RE Brisbane
idents sandbagg

Department of Environment and Resource Management – Parliamentary Briefing Note

To	Minister Robertson
Prepared for	Parliamentary sittings 5 -7 October 2010

WIVENHOE DAM SPILLING – the likelihood of Wivenhoe Dam spilling and safety

KEY POINTS

- On the 1 October 2010, Wivenhoe Dam reached 100 per cent for the first time since 2001.
- After the weekend's weather, the dam reached 101 per cent on Monday.
- On Monday 4 October, Seqwater commenced controlled increased releases from Wivenhoe Dam through the hydro-electric plant in the dam wall.
- Even with substantial rain, Wivenhoe Dam's flood capacity is equal to 3 times Sydney harbour - or - 1.45 million megalitres.
- Releases from Somerset Dam into Wivenhoe Dam via the cone valves ceased over the weekend.
- Seqwater has a Dam Safety Management Program and a Flood Control Centre. The program ensures that each of its dams is operated and maintained in a manner that is both safe and minimises the risks associated with a dam failure and flood events, including working with local councils and emergency services.

Contact: Dan Spiller
Telephone: [redacted]
Date: 4 October 2010
CTS No. 17669/10

Approved: Mike Lyons, Director, SEQ Water Grid Comms
Approved: [Insert title of ADG or DDG]
Approved: Director-General

RESPONSE

- On the 1 October 2010 Wivenhoe Dam reached 100 per cent for the first time since 2001.
- After the weekend's weather, the dam reached 101 per cent on Monday 4 October 2010.
- The trigger level for full gate releases for Wivenhoe Dam is 102.5 per cent.
- Also on Monday 4 October, Seqwater commenced controlled increased release from Wivenhoe Dam through the hydro-electric plant in the dam wall.
- The released water passes through the dam's hydro-electric generator before being sent to Mt Crosby Water Treatment Plant as part of the Grid's water supply.
- These releases will continue for roughly 10 days, depending on further inflows and weather.
- Seqwater expects to have released between 10,000 and 12,000 megalitres to reduce Wivenhoe Dam to just below the Full Supply Level.
- There is no impact downstream as a result of these releases.
- The hydro-electric plant, owned by Stanwell Energy Corporation, is built into the dam wall.
- Water is fed through a turbine in the hydro-electric plant to generate renewable energy.

Contact: Dan Spiller
Telephone: [redacted]
Date: 4 October 2010
CTS No. 17669/10

Approved: Mike Lyons, Director, SEQ Water Grid Comms
Approved: [Insert title of ADG or DDG]
Approved: Director-General

- Water supplied for consumption is always released through the hydro-electric plant.

SEQ Water Grid flood preparation

- Wivenhoe has enormous flood capacity – almost the equivalent of three times Sydney Harbour (1.45 million megalitres). To put this in context, Wivenhoe has received 376,000 megalitres in flows for the year to date.
- As well as the protection of flood storages, Seqwater has a Dam Safety Management Program. The program ensures that each of its dams are operated and maintained in a manner that is both safe and minimises the risks associated with a dam failure and flood events, including working with local councils and emergency services.
- The program has been endorsed and approved by the Dam Safety Regulator.
- The Flood Control Centre will mobilise during a flood event at North Pine, Somerset or Wivenhoe dams. It operates 24 hours a day with teams of operators at each dam 24 hours a day managing releases.

Benefits of the Grid

- The Grid enables us to choose the water use – meaning that it is the most secure water supply in Australia, in drought and when the dams are full.
- Heavy rain often causes water quality issues. It drags nutrients and other compounds from the catchments into our water supplies.
- With the Grid, we are better prepared for these events than ever before. We can isolate, or blend water from multiples sources.

Wivenhoe Dam operating level

- Investigations have commenced into the extent to which the full supply level of Wivenhoe Dam could be raised, without raising the dam wall and while maintaining acceptable risk levels at the dam itself and inundated areas.
- We will not take risks with flood safety.
- The investigation will involve detailed investigations associated with upstream and downstream flooding, environmental considerations, impacts on infrastructure and lease resumptions.
- Until the raising of the full supply level is fully assessed, flood waters will be cleared to the existing Full Supply Level in accordance with the existing Flood Operations Manual

developed by Seqwater and approved by the Dam Safety Regulator, to ensure public safety is maintained.

BACKGROUND

Hydro Electric Plant at Wivenhoe Dam

- Wivenhoe Dam houses a pumped-storage, hydro-electric generating facility. This power station is situated between Splityard Creek Dam and Lake Wivenhoe.
- During the pumping phase in the operating cycle the generator will operate as an electric motor driving the pump to lift water from Lake Wivenhoe to the upper storage of Splityard Creek Dam. When peak electricity demand occurs the flow of water is reversed, flowing from the upper to the lower storage and driving the turbine generator to generate electricity.
- The pumped storage power station consists of two circular concrete silos, each of about 32 metres internal diameter. Each of the silos house a 250MW turbine generator and pump set.
- The power station is unmanned and is controlled remotely from the central operating centre for the Queensland power grid system. All aspects of the operation are monitored by computers within the centre. Twin 275KV transmission lines connect the power station to the State's grid system

Contact: Dan Spiller
Telephone: [redacted]
Date: 4 October 2010
CTS No. 17669/10

Approved: Mike Lyons, Director, SEQ Water Grid Comms
Approved: [Insert title of ADG or DDG]
Approved: Director-General

Department of Environment and Resource Management – Parliamentary Briefing Note		
To	Minister Robertson	
Prepared for	Parliamentary sittings ~~26-28 October~~23-25 November 2010	**73**

WIVENHOE DAM SPILLING – likelihood of spilling and safety

KEY POINTS

- On the 1 October 2010, Wivenhoe Dam reached 100 per cent for the first time since 2001.
- On Saturday 9 October, Seqwater commenced releases from the Wivenhoe Dam spillway.
- Releases continued until 19 October 2010, which included a phased shutdown of the spillway gates.
- At the time the Wivenhoe gates were closed on 19th October, small baseflows, supplemented by occasional rainfall, continued to flow into Somerset and Wivenhoe Dams and resulted in both dams rising above Full Supply Level.
- Under Flood Manual rules, Seqwater is required to maintain the flood storage component and return the dams to Full Supply Level.
- To date, 15,000 megalitres have been released from Somerset and 72,000 megalitres have been released from Wivenhoe since the gates were closed on 19 October 2010.
- No releases are currenty being made from Somerset Dam and a normal operating release of 319 megalitres per day is being maintained from Wivenhoe Dam.

Contact: Dan Spiller
Telephone: [redacted]
Date: 18 October 2010

Approved: Barry Dennien, CEO Water Grid Manager
Approved: Chris Robson, A/Deputy Director-General
Approved:

CTS No. 18687/10

- Wivenhoe Dam's flood capacity is equal to three times Sydney harbour - or - 1.45 million ~~Megalitres~~megalitres.

- Seqwater has a Dam Safety Management Program approved by the State's Dam Safety Regulator, as well as a Flood Control Centre.

- The program ensures that each of its dams is operated and maintained in a manner that is both safe and minimises the dam failure risks associated with flood events, including developing and implementing working arrangements with local councils and emergency management groups.

RESPONSE

- On the 1 October 2010 Wivenhoe Dam reached 100 per cent for the first time since 2001.
- On Saturday 9 October 2010, Seqwater began releasing water from Wivenhoe Dam over and above that required for consumption, as a result of flood inflows.
- This action is in accordance with the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam, which is approved by the State's Dam Safety Regulator in accordance with the *Water Supply Act 2008*.
- The current flood release manual was reviewed during 2009 and finalised in January 2010. Seqwater is required to provide

relevant catchment councils with a copy of the flood manual and this occurred. Councils provided with copies include Somerset Regional Council, Ipswich City Council and Brisbane City Council.

- Flood water releases through the dam's spillway gates continued until the morning of 19 October 2010, including a 48 hour phased shutdown.
- The phased shutdown allows Seqwater to control the water through a systematic closure of the gates to discharge stored floodwater to provide for further flood events and to allow Councils to reopen river crossings.
- The phased shutdown also aims to minimise adverse environmental impacts on the river system by copying the natural regression of the flood event.
- Seqwater released 655,000 megalitres to bring Wivenhoe Dam back Full Supply Level.
- At the time the Wivenhoe gates were closed on 19th October, small baseflows, supplemented by occasional rainfall, continued to flow into Somerset and Wivenhoe Dams and resulted in both dams rising above Full Supply Level. Under Flood Manual rules, Seqwater is required to maintain the flood storage component and return the dams to Full Supply Level.
- Water is continuing to be released through 1.5 metre Cone Dispersion Vales to maintain Full Supply Level.

Contact: Dan Spiller
Telephone: [redacted]
Date: 18 October 2010

CTS No. 18687/10

Approved: Barry Dennien, CEO Water Grid Manager
Approved: Chris Robson, A/Deputy Director-General
Approved:

- Water supplied for consumption is released through the hydro-electric plant whenever possible.

SEQ Water Grid flood preparation

- Wivenhoe has enormous flood capacity – almost the equivalent of three times Sydney Harbour (1.45 million megalitres).
- In accordance with the requirements of the *Water Supply Act 2008*, Seqwater maintains a comprehensive Dam Safety Management Program covering its 25 referable dams.
- The program ensures that each of its dams are operated and maintained in a manner that is both safe from a structural perspective and minimises the dam failure risks associated with flood events.
- This includes making arrangements with local councils and emergency management agencies for appropriate response to dam safety emergencies including flood events.
- The program has been endorsed and approved by the Dam Safety Regulator.
- The Flood Control Centre will mobilise during a flood event at North Pine, Somerset or Wivenhoe dams. It operates 24 hours a day with teams of operators at each dam 24 hours a day managing releases.

Wivenhoe Dam operating level

- Investigations have commenced into the extent to which the full supply level of Wivenhoe Dam could be raised, without raising the dam wall and while maintaining acceptable risk levels at the dam itself and inundated areas.
- When it comes to flood, we will not take risks with South East Queensland's safety.
- The investigation will involve detailed ~~investigations~~ assessments associated with upstream and downstream flooding, environmental considerations, impacts on infrastructure and lease resumptions.
- Until the raising of the full supply level is fully assessed, flood waters will be cleared in accordance with the existing Manual of Operational Procedures for Flood Mitigation.

Contact: Dan Spiller
Telephone: [redacted]
Date: 18 October 2010

CTS No. 18687/10

Approved: Barry Dennien, CEO Water Grid Manager
Approved: Chris Robson, A/Deputy Director-General
Approved:

CTS No. 21654/10 **I/10/0523**

Advisor ..... OK
Dated / /
Approved Not Approved Noted
Further information required
Minister.....
Dated / /

SEQ Water Grid
MINISTERIAL DEPUTATION BRIEFING NOTE
SEQ Water Grid Manager Board Meeting
Monday 13 December 2010 at 1.00pm

TO: **Minister for Natural Resources, Mines and Energy and Minister for Trade**

SUBJECT: Points for discussion for meeting with the SEQ Water Grid Manager Board

BACKGROUND

- The Minister has been invited to meet with the South East Queensland (SEQ) Water Grid Manager (WGM) Board on 13 December 2010 at 1.00pm.
- The WGM intends this to be an informal meeting which will include a tour of the newly completed Water Grid Emergency Management Room and provide an opportunity for the Minister to ask questions and discuss the operation of the Water Grid.
- All WGM Board members will attend the meeting. All members of the WGM executive management team will also attend this meeting.

CURRENT ISSUES

- In addition to providing a tour of the newly completed Water Grid Emergency Management Room, the WGM is particularly interested in discussing three matters with the Minister, namely:
  1. General feedback from the Minister on the WGMs optimal operation of the Water Grid, focused on the WGMs Climate Resilience Report,
  2. An update of the role of the SEQ Water Grid Manager in the planning and approval process for capital expenditure, and;
  3. An update on Wivenhoe Dam's operating level, for flood mitigation.
- The Minister wrote to the WGM and WaterSecure on 13 September 2010 (CTS13479/10), requesting advice on optimised operating arrangements for the Water Grid and climate resilient supply projects, in relation to current and potential demand for bulk water and purified recycled water.
- The Minister also wrote to QWC in September 2010 (CTS13479/10), inviting QWC to provide input into optimal operating arrangements for the Water Grid.

Climate Resilience Report

- The WGMs Climate Resilience Report (the Report) has been completed and sent to responsible Ministers.
- The Minister replied to this advice on 3 December 2010 (CTS21372/10). Further to the Ministers response of 3 December 2010, the Minister will be advised on the timing and program for implementation of the recommended strategy, during the meeting with the WGM Board and executive management team on 13 December 2010.

Emergency Response

- The WGM would also like to provide the Minister with a general demonstration of the Emergency Management Room facilities. This will mainly involve a demonstration of the

Author	Cleared by	Cleared by	Recommended:
Name: Jade Simmons Position: Snr Correspondence Officer Tel No: [redacted] Date: 3 December 2010	Name: Mike Lyons Position: Director, SEQ Tel No: [redacted] Date: 3 December 201	Name: Position: Tel No: Date:	Name: Tel No: Date:
	Name : Barry Dennien Position: CEO, SEQWGM Tel No: [redacted] Date: 3 December 2010	Name: Position: Tel No: Date:	

File Ref:

new OCA Incident Manager which is being implemented as a result of the recommendations from the Exercise Matrix.

- The Exercise Matrix, the test of the Water Grid's response to an emergency, was successfully completed over the period 2 to 3 March 2010. The exercise was facilitated and conducted by MC2 Pacific, an independent emergency management consultancy, who assessed the suitability and effectiveness of responses by Grid Participants. As a result of the Exercise Matrix MC2 Pacific prepared a report containing recommendations for the WGM.
- The WGM has accepted and will implement all recommendations developed by MC2 Pacific. The State Disaster Coordination Centre in Emergency Management Queensland supported the recommendations included in the MC2 Pacific report.
- The MC2 Pacific recommendations (CTS10434/10) noted that there were several major strengths, like technical strategy, and weaknesses, both in the processes and their deployment and handling of communications, in the multi-participant test. Specific actions were recommended in relation to documentation and implementation (CTS10434/10).
- The OCA Incident Manager system (the system) is a secure, online software solution for managing emergencies across the Water Grid. It gives the WGM and all Grid Participants involved the tools to manage an emergency in one place, in real time.
- The system provides a live, up-to-date solution for managing whole-of-Grid emergencies and aligns with the SEQ Water Grid Risk Management Plan. The system has the ability to send communications, manage incident information and monitor situation reporting, logging and mapping.
- The Minster and relevant staff from the Ministers Office will be set up as 'visitors' on the system, meaning that they are able to view key incident management data, including situation reports, in real time.

Planning and approval process for capital expenditure

- The Minister wrote to the Chair of the WGM on 20 October 2010 (CTS17750/10), in relation to clarification of the role of the WGM in the planning and approval process for capital expenditure.
- The WGM will provide response to the Ministers correspondence shortly.
- The WGM will also provide a verbal update of capital expenditure planning and approval process at the meeting of 13 December 2010.

Wivenhoe operating level, for flood mitigation.

- The Minister also wrote to the Chair of the WGM on 25 October 2010 (CTS19311/10), seeking advice regarding available options and likely benefits of releasing water from key storages in anticipation of major inflows over the coming summer.
- The WGM will provide response to the Ministers correspondence shortly.
- The WGM will also provide a verbal update of options and likely benefits of reducing Wivenhoe Dam's operating level, for flood mitigation in anticipation of major inflows from rainfall in the catchment area over summer, at the meeting of 13 December 2010.

MNISTER'S COMMENTS

ATTACHMENTS
There are no attachments to this Brief

Author	Cleared by	Cleared by	Recommended:
Name: Jade Simmons Position: Snr Correspondence Officer Tel No: [redacted] Date: 3 December 2010	Name: Mike Lyons Position: Director, SEQWGM Tel No: [redacted] Date: 3 December 2010	Name: Position: Tel No: Date:	Name: Tel No: Date:
	Name : Barry Dennien Position: CEO, SEQWG[redacted] Tel No: [redacted] Date: 3 December 2010	Name: Position: Tel No: Date:	

File Ref:

TRIM ref: D/10/7953

24 December 2010

Hon Stephen Robertson MP
Minister for Natural Resources, Mines and Energy
and Minister for Trade
PO Box 15216
Brisbane Qld 4001

Dear Minister

I am pleased to respond to your letter of 25 October 2010 regarding options to and benefits of releasing water from key storages in anticipation of major inflows over the current wet season. Our advice follows, based on discussions with Seqwater.

Only four of the dams in South East Queensland region are gated, with the ability to release significant amounts of water in anticipation of major inflows. These are Wivenhoe, Somerset, North Pine and Leslie Harrison dams.

Detailed operational procedures have been approved for each of the gated dams. The dams will continue to be operated in accordance with these procedures. These procedures generally relate to the management of the dams and should be managed above Full Supply Level. This advice relates to the water security aspect of the management of the dams below Full Supply Level.

Based on information currently available, Seqwater has advised that releasing water to below Full Supply Level may provide some benefits in terms of reduced community and operational impacts during minor inflow events, such as has occurred over the past month. For medium and major flood events, it considers that pre-emptive releases will provide negligible benefits.

Informed by this advice, the SEQ Water Grid Manager has advised Seqwater that, from a water security perspective, it has no in-principle objection to minor releases from Wivenhoe, Somerset and North Pine dams to minimise the operational and community impacts of gate releases. Specifically, it has advised that it has no in-principle objection to:

- Wivenhoe and Somerset dams being drawn down to 95 per cent of their combined Full Supply Level
- North Pine Dam being drawn down to 97.5 per cent of its Full Supply Level.

The SEQ Water Grid Manager has assessed the water security implications of the release to be negligible, having no impact on our ability to meet the risk criteria specified in the System Operating Plan or our ability to meet our supply obligations to Grid Customers. From a water security perspective, the Queensland Water Commission has also confirmed that it does not have any objections to the potential release.

Please note that these arranges are intended to apply for the current wet season only, taking into account the level of storages and the rainfall forecasts over coming months.

For future wet seasons, the SEQ Water Grid Manager will continue to work with Seqwater to investigate the optimal arrangements. In particular, we propose to further investigate options that may reduce the frequency or duration of intermediate level flows (between 1,900 and 3,500 cubic metres per second). In addition, we recommend that the investigations with the Queensland Water Commission to examine the opportunity of raising the full supply level of Wivenhoe Dam for water supply be expanded to include options involving the release of the additional water once major inflows are forecast.

I trust that this advice is sufficient. If you have any questions, please do not hesitate to contact Mr Dan Spiller, Director Operations, by telephone on [redacted] or by email on [redacted]

Yours sincerely

[redacted]

Gary Humphrys
Chair

ATTACHMENT

Wivenhoe and Somerset dams

Wivenhoe Dam can store up to 1.15 million litres (ML) of drinking water. In addition, it has the capacity to store an additional 1.45 ML of flood water.

While large, the flood compartment can be filled within days. For example, following heavy rainfall in October 2010 Wivenhoe Dam received inflows equivalent to almost half of the flood storage compartment capacity in just a few days.

Several factors influence flood release strategies for Wivenhoe and Somerset dams.

First, rain events that have caused flooding have historically been prolonged events over several days, often with a second event occurring several days to a week after the first. As a result, the operational procedures for the dam are designed to ensure that all water held in the flood compartments is released within seven days of a rain event, ensuring that the flood compartment is available for any future inflows.

Secondly, the dam only controls flood waters from part of the Brisbane River catchment area. About 50 per cent of the catchment area of the Brisbane River is upstream of the Wivenhoe Dam wall, and can be potentially controlled by it. No flood mitigation structures exist for most of the potential run-off from the other 50 per cent of the catchment area.

Third, the Bureau of Meteorology has had limited success in plotting rainfall distribution accurately to assess where most flooding risk lies above or below the dam wall. Historical floods have demonstrated that flooding can occur from both. For example, the 1974 flood flows primarily occurred below the dam wall whilst the 1890's event occurred above the dam wall. As a result, when releasing water from Wivenhoe Dam it is very important to predict and monitor below the dam wall flows so as to understand combined river flows that cause flood impacts.

Taking these factors into account, the flood release strategy for Wivenhoe and Somerset dams has a hierarchy of objectives:

- Ensure the structural safety of the dam
- Provide optimum protection of urbanised areas from inundation
- Minimise disruption to rural life
- Retain full supply level after a flood event
- Minimise impacts to flora and fauna during the drain down phase.

Within this framework, flood releases from Wivenhoe Dam typically fall into two categories of flood events based on the impact they cause when combined with below the dam wall catchment runoff:

- Larger events typically involving combined river flows greater than 3,500 cubic meters per second measured at Moggill. These events would have flood impacts on

urban areas in Brisbane. This scale of release has not been required since Wivenhoe Dam was completed.

- Smaller events with combined river flows of less than 1,900 cubic meters per second measured at the Mt Crosby weir which can inundate up to seven rural bridges isolating up to 50 households and causing inconvenience to many more. There has been six of these events since 1984, when Wivenhoe Dam was completed.

Our assessment of the benefits of lowering dam storage levels to reduce flooding impacts is below for these two event types.

Large events

Seqwater has advised that releases of greater than 3,500 cubic metres per second (m3/s) from Wivenhoe Dam are likely to impact on urban areas in Brisbane. Events of this nature have not been experienced since Wivenhoe Dam was completed in 1984.

Seqwater has advised that:

- pre-emptive releases are likely to have negligible impacts on the extent of these impacts
- any impacts would require releases of at least 250,000 ML. This is equivalent to a release of about 16 per cent of the combined storage capacity of Wivenhoe and Somerset dams.

A pre-emptive release of this scale is not recommended, based on information currently available. The potential water security impacts are considered to be more significant than the negligible benefits. These potential security impacts include costs associated with the earlier or avoidable operation of the desalination facility at capacity, as well as the increased probability of triggering the implementation of a drought response plan.

More detailed investigation of opportunities to actively manage flood storage is recommended, including options to increase flood supply level on a temporary basis. These investigations need to be led by Seqwater, and involve the Bureau of Meterology, Councils and the SEQ Water Grid Manager.

In particular, t has been identified that it is worth investigating the impacts on downstream flooding for intermediate level flows (flows between 1900 and 3500 cm^3/s).

Seqwater will undertake extensive investigations for the Queensland Water Commission in early 2011 to examine the opportunity of raising the full supply level of Wivenhoe Dam for water supply. We will recommended that the scope of this work be widened to consider the benefits of pre-lowering storage levels based on mid range rainfall events and the reduced impacts to river levels and subsequent property impacts. It is noted that predicting rainfall intensity and location, even as events are about to occur has not been accurate, however the Bureau of Meteorology is improving its methods.

Smaller events

Pre-emptive releases from Wivenhoe Dam may reduce the impacts of minor gate releases (strategies W1A to W1E in the operational procedures).

Minor gate releases may result in the closure of up to six bridges, isolating up to 50 dwellings and inconveniencing many more. As stated in existing flood management plans, releases should be managed to minimise the impacts on these residents. Over the immediate term, Councils have requested that bridge closures be avoided over the Christmas to New Year period, if at all possible. In addition:

- There are resource implications involved in the activation of the flood control centre. Under flood management plans, the centre must be staffed by suitability qualified officers at all times during gate releases. There are currently only four quality duty engineers, who have staffed the flood centre for much of period since the initial release in October.
- Gate releases during the Christmas holiday period would result in closure of dams to water based activities, impacting on up to 150,000 people who are expected to use the recreational facilities over the holiday period.

The Water Grid Manager has advised Seqwater that, from a water security perspective, it would not object to water being released from Wivenhoe and Somerset dams to 95 per cent of storage capacity at any time until end March 2010.

Under this recommendation, storage levels could potentially be reduced by up to about 77,250 ML. This is equivalent to the amount of water released between 13 and 16 December 2010, through a single gate.

Pre-emptive releases will be managed so as to minimise the likelihood of gate releases due to small storms and local rainfall. Storage capacity will usually be reduced through a combination of:

- Extended gate releases, especially for strategy W1C. For comparison, up to 130,000 ML/day was released during in November and mid December 2010. At this rate, the additional releases could occur in about half a day.
- Ongoing gate releases of up to 30,000 ML/day, which do not isolate any residents but can inundate some lower bridges that cause inconvenience.
- Ongoing valve release of up to about 4,300 ML/day, which can be maintained without inundate any bridges.

Actual releases would be decided by Seqwater based on operational considerations and in accordance with its statutory and regulatory obligations.

Water security impacts

The water security impacts of releases will be zero if the dams fill over the remainder of the wet season. Current forecasts indicate that there is a high probability of this occurring:

- Heavy rainfall is forecast over the Christmas holiday period, as noted above.
- Over the remainder of the wet season, advice from the Bureau of Meteorology is that sea surface temperatures are likely to remain at levels typical of a La Niña event into the first quarter of 2011, with the majority of the models indicating the event will gradually weaken over the coming months.

The water security impacts will be minimal, even if there were no further inflows to the dams. Modelling indicates that the reduction would have a minimal impact on the probability of key water Grid storages falling to 40 per cent of capacity over the next five years.

North Pine and Leslie Harrison dams

North Pine and Leslie Harrison dams do not have flood mitigation potential. Once the dams have reached Full Supply Level, all water flows into the dam must be released to protect the structural safety of the dam.

Seqwater has advised that, without major releases, there are negligible benefits to reducing volumes stored in North Pine or Leslie Harrison dams for the purposes of reducing the extent or duration of any downstream flooding impacts.

For North Pine Dam, there may be some operational and community benefits to minor releases to below Full Supply Level in some circumstances. Any gate operation at North Pine Dam results in inundation of Youngs Crossing Road, which isolates a number of residents. These impacts are currently being minimised by releasing from North Pine Dam at night. With further rainfall forecast, Seqwater may choose to reduce the level to below Full Supply Level in order to reduce the frequency of night releases or the likelihood of releases being required during the day.

For this dam, the SEQ Water Grid Manager has advised Seqwater that, from a water security perspective, it would not object to water being released to 97.5 per cent of storage capacity at any time until end March 2010.

For Leslie Harrison Dam, gate operations do not impact on public roads and generally only inconvenience the general public during large flood events. There is no scope to reduce this inconvenience through small pre-emptive releases. Accordingly, no in-principle approval be made for pre-emptive releases from this dam.

CTS No. 01061/10

SEQ Water Grid Manager and Seqwater
MINISTERIAL BRIEFING NOTE

Advisor .....☐ Ok
Dated / /
☐ Approved ☐ Not Approved ☐ Noted
☐ Further information required
Minister [redacted]
Dated 16/1/10

RECEIVED
MINISTERIAL OFFICE
17 JAN 2011

☐ MINISTER
☐ POL ADV
☐ MEDIA ADV
☐ PARL SEC
☐ ADMIN
☐ .....

TO: **Minister for Natural Resources, Mines and Energy and Minister for Trade**

SUBJECT: **January 2011 flood event and Wivenhoe Dam operations**

REQUESTED BY

- The Ministers Office requested this brief by 16 January 2011.

TIMEFRAME

- Noting of this brief is required prior to the Emergency Cabinet meeting to be held on 17 January 2011.

RECOMMENDATION

It is recommended that the Minister:

- **note** Seqwater's Ministerial briefing note setting out background information on Wivenhoe Dam, the January 2011 flood event and Seqwater's Flood Mitigation Manual.
- **note** the advice on the benefits of pre-emptive releases from Wivenhoe Dam in response to the Minister's request.
- **note** Mr Brian Cooper's independent compliance review of the operation of Wivenhoe Dam against the Flood Mitigation Manual for the January 2011 flood event.
- **approve** key media responses on the flood event and Wivenhoe Dam.
- **approve** that Mr Barry Dennien, Chief Executive Officer, SEQ Water Grid Manager, speak to the media in accordance with the key media responses.

BACKGROUND

- From 13 December 2010 to 11 January 2011, South East Queensland experienced unprecedented rainfall, which resulted in the January 2011 flood event. Wivenhoe Dam played a significant role in mitigating the downstream flood peak.
- **Attachment A** contains Seqwater's Ministerial briefing note setting out background information on Wivenhoe Dam, Wivenhoe Dam's flood mitigation and operations, Seqwater's Flood Mitigation Manual, the regulatory context of the Flood Mitigation Manual and Seqwater's proposed procedure for the preparation of its comprehensive Flood Mitigation Manual report to the Chief Executive, Department of Environment and Resource Management, on Wivenhoe Dam operations for the January 2011 flood event.
- After the Wivenhoe Dam release in October 2010, by way of a letter dated 25 October 2010 at **Attachment B,** the Minister requested the SEQ Water Grid Manager to procure urgent advice as to whether South East Queensland's water security situation would provide "*an opportunity to reduce the volume stored in key dams as a means of reducing the severity, frequency and duration of flooding in downstream areas.*"
- The Minister also sought the SEQ Water Grid Manager's "*confirmation that these options would not significantly impact upon our current water security, measured as the probability of needing to reintroduce Medium Level Restrictions over the next five to ten years.*"
- As a result, the SEQ Water Grid Manager requested that Seqwater provide a report assessing the options requested by the Minister.

Author	Cleared by	Cleared by	Recommended:
Name: Barry Dennien	Name:	Name:	Name: John Bradley
Position: Chief Executiv	Position:	Position:	Director-General, DERM
Officer, SEQ Water Gric	Tel No:	Tel No:	Tel No: [redacted]
Manager	Name:	Name:	Date:
Tel No: [redacted]	Position:	Position:	
Date: 16 January 2011	Tel No:	Tel No:	

File Ref: [redacted]

- **Attachment C** contains the SEQ Water Grid Manager's letter to the Minister dated 24 December 2010, in response to the pre-emptive Wivenhoe Dam release advice sought, based on Seqwater's advice. This letter stated that "*Seqwater has advised that releasing water to below Full Supply Level may provide some benefits in terms of reduced community and operational impacts during minor inflow events, such as has occurred over the past month. For medium and major flood events, it considers that pre-emptive releases will provide negligible benefits...Informed by this advice, the SEQ Water Grid Manager has advised Seqwater that, from a water security perspective, it has no in-principle objection to minor releases from Wivenhoe, Somerset and North Pine dams to minimise the operational and community impacts of gate releases.*"
- It should be noted that while seeking advice from Seqwater on pre-emptive dam releases, the SEQ Water Grid Manager continued to provide the Department of Environment and Resource Management with progress reports.
- On 11 January 2011, the Minister requested the SEQ Water Grid Manager to procure an urgent independent review of Seqwater's operation of Somerset and Wivenhoe Dams in accordance with the Flood Mitigation Manual, for the period 13 December 2010 to 11 January 2011.
- Mr Brian Cooper was engaged to conduct the independent review and his report and curriculum vitae are contained in **Attachment D.**
- Mr Brian Cooper concludes that the "*strategies as set out in the Flood Mitigation Manual have been followed, allowing for the discretion given to making variations in order to maximise flood mitigation effects. The actions taken and decisions made during the Flood Event appear to have been prudent and appropriate in the context of the available knowledge available to those responsible for flood operations and the way events unfolded.*"

CURRENT ISSUES

- The purpose of this Ministerial brief is to provide the Minister with background information on the January 2011 flood event and the operation of Wivenhoe Dam, in preparation for an Emergency Cabinet meeting scheduled on 17 January 2011.
- This Ministerial brief provides information that may assist in responding to questions raised, or anticipated to be raised, by the public and media.
- **Attachment E** contains key media responses based on factual information from Seqwater's Ministerial briefing note.

RESOURCE/IMPLEMENTATION IMPLICATIONS

- Any recommendations regarding the Flood Mitigation Manual, improvements to the structure or operation of Wivenhoe Dam, resourcing etc. will arise after any relevant flood event debriefs and Seqwater's Flood Mitigation Manual report to the Chief Executive, Department of Environment and Resource Management.

PROPOSED ACTION

- In accordance with the Flood Mitigation Manual, Seqwater will submit a comprehensive report to the Chief Executive, Department of Environment and Resource Management, containing details of the procedures used, the reasons for such and other pertinent information for the operation of Wivenhoe Dam during the January 2011 flood event.
- This report is required to be submitted within six weeks of completion of the flood event.

Author	Cleared by	Cleared by	Recommended:
Name: Barry Dennien Position: Chief Executive Officer, SEQ Water Grid Manager Tel No: [redacted] Date: 16 January 2011	Name: Position: Tel No: Name: Position: Tel No:	Name: Position: Tel No: Name: Position: Tel No:	Name: John Bradley Director-General, DERM Tel No: [redacted] Date:

OTHER INFORMATION

- *Consultation:* In preparing the Ministerial briefing note at **Attachment A**, Seqwater consulted with Mr Peter Allen and Mr Bob Reilly from the Office of the Water Supply Regulator, Department of Environment and Resource Management. The SEQ Water Grid Manager provided information on the Minister's request for advice on pre-emptive releases from Wivenhoe Dam and the independent compliance review from Mr Brian Cooper.
- *Legislation:* The Flood Mitigation Manual is a requirement of, and approved by the Chief Executive, Department of Environment and Resource Management, under the *Water Supply (Safety and Reliability) Act 2008*.
- *Key Communication Messages:* The information contained in this Ministerial brief may be used to formulate public messaging regarding the flood event and the operation of Wivenhoe Dam. Communicating the benefits of Wivenhoe Dam for flood mitigation may present positive communication opportunities.

MINISTER'S COMMENTS

ATTACHMENTS

- **Attachment A: Seqwater Ministerial briefing note**
- **Attachment B: Letter from Minister Robertson to the SEQ Water Grid Manager dated 25 October 2010**
- **Attachment C: Letter from the SEQ Water Grid Manager to Minister Robertson dated 24 December 2010**
- **Attachment D: Flood Mitigation Manual compliance review report by Mr Brian Cooper and curriculum vitae of Mr Brian Cooper**
- **Attachment E: Key media responses**

Author	Cleared by	Cleared by	Recommended:
Name: Barry Dennien Position: Chief Executive Officer, SEQ Water Grid Manager Tel No: [redacted] Date: 16 January 2011	Name: Position: Tel No: Name: Position: Tel No:	Name: Position: Tel No: Name: Position: Tel No:	Name: John Bradley Director-General, DERM Tel No: [redacted] Date:

File Ref:

Ministerial Briefing Note
17 January 2010
Flood Event January 2011

1. BACKGROUND INFORMATION ON WIVENHOE DAM

2. WIVENHOE DAM FLOOD MITIGATION AND FLOOD OPERATIONS

2.1 What were the benefits provided by Wivenhoe Dam during the current event?

2.2 Why was Wivenhoe Dam only allowed to rise up to 191% and not 230%?

2.3 What is the role of the erodible fuse plug embankments?

2.4 Why weren't pre-emptive releases undertaken prior to the start of the flood event?

2.5 Is there a detailed record of the events associated with the current flood?

3. THE MANUAL OF OPERATIONAL PROCEDURES FOR FLOOD MITIGATION AT WIVENHOE DAM AND SOMERSET DAM

3.1 What is the Manual of Flood Mitigation and how was it developed?

3.2 What is contained in the Manual?

4. REGULATORY CONTEXT

5. SEQWATER REPORT

1 BACKGROUND INFORMATION ON WIVENHOE DAM

Wivenhoe Dam was completed in 1984 and has two main functions;

- A 1,165,000 ML storage providing an urban water supply for Brisbane;
- Flood mitigation in the Brisbane River by providing a dedicated flood storage volume of 1,450,000 ML (this flood storage was increased in 2005 to 1,966,000 ML with the dam at the point of failure).

In accordance with the Queensland Regulatory program for dam spillway upgrades, a further upgrade of Wivenhoe Dam is scheduled to occur prior to 2035 but only for dam safety reasons in the event of a probable maximum flood and has no impact on the current event.

Wivenhoe Dam is in excellent condition with four Comprehensive Dam Safety reviews undertaken in the last 14 years, the latest in 2010.

2 WIVENHOE DAM FLOOD MITIGATION AND FLOOD OPERATIONS

2.1 What were the benefits provided by Wivenhoe Dam during the current event?

The following graphs demonstrate the significant benefits of Wivenhoe Dam in mitigating the current flood event, with reductions in flood peak from Wivenhoe Dam not existing of up to 2.5 metres in the City area and up to 5.5 metres in the Moggill area further upstream.

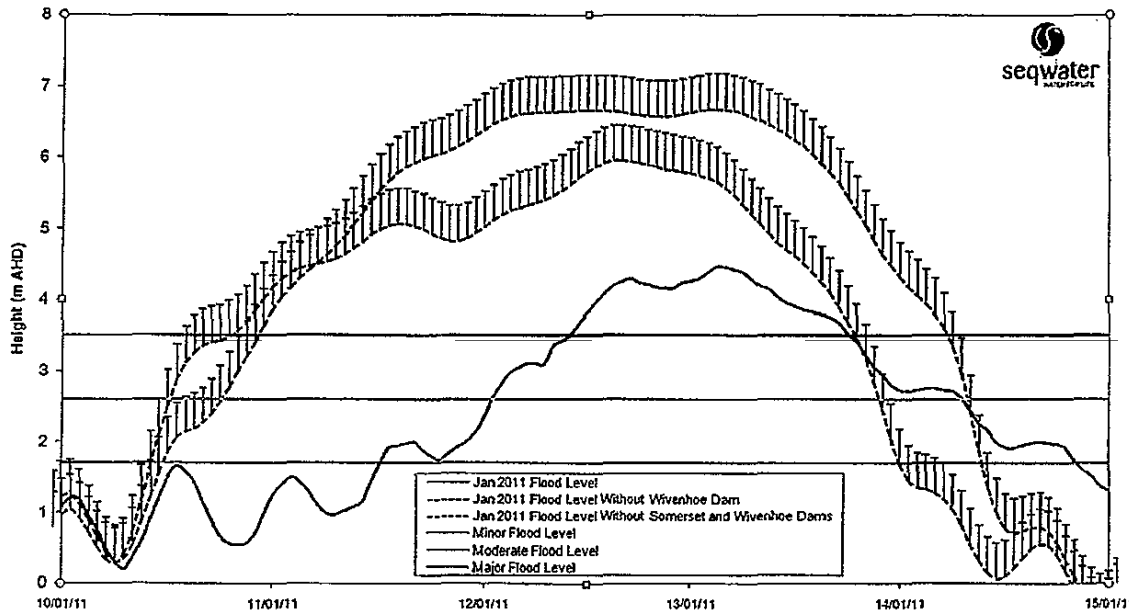
This equates to significant reduction in the potential for loss of life as well as saving in damages in the order of up to $1.6 billion based on current damage curves. Up to 13,000 more properties would have been impacted by the event without the Dam. (Source: Flood Damage Tables provided to Seqwater by the Brisbane City Council).

The time at which flood levels remained elevated above major levels has also been reduced by up to 3 days by the dam. This has significant benefits to impact on the population of the city, property damage and the recovery operation.

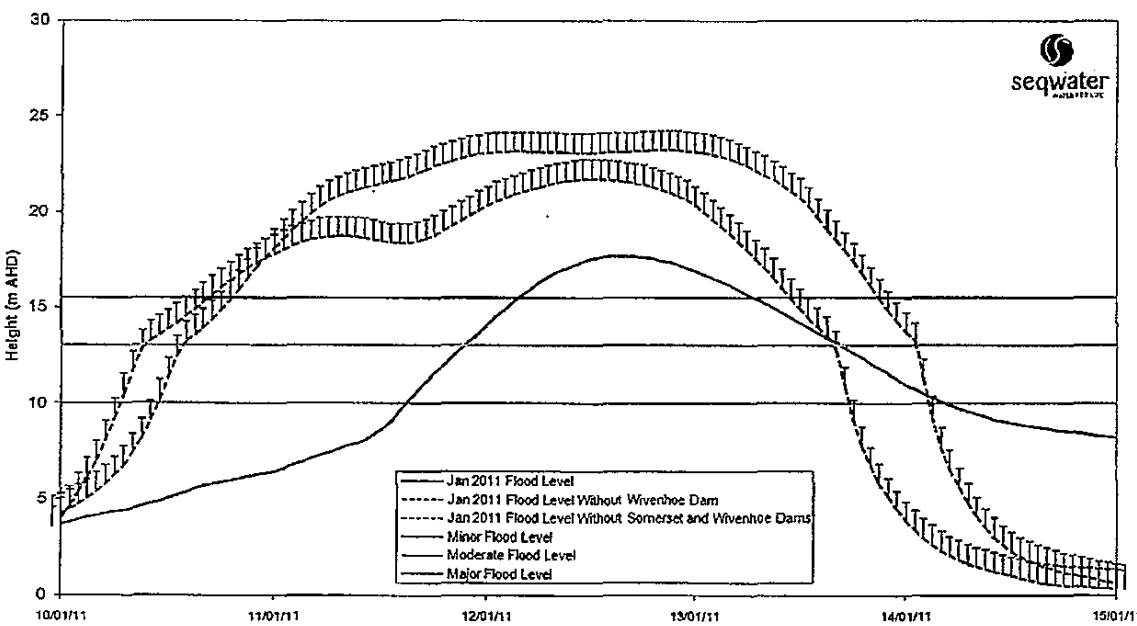
Depending on the nature of the event, the presence of Wivenhoe Dam could also potentially increase flood warning times to impacted areas. How these times may have been increased during the current event is presently difficult to quantify, but discussions will be held with BOM on this issue at a later date.

In addition, the strategy adopted to quickly close off releases once the peak in the dam had been reached and rain stopped falling certainly reduced the predicted flood peak by at least one metre in the lower Brisbane River area. This was carried out because the releases had stopped the dam from rising and careful monitoring allowed rapid reduction of releases while ensuring fuse plug initiation did not occur.

JANUARY 2011 BRISBANE FLOOD
Assessment of Flood Levels at Brisbane City



JANUARY 2011 BRISBANE FLOOD
Assessment of Flood Levels at Moggill



2.2 Why was Wivenhoe Dam only allowed to rise up to 191% and not 230%?

Wivenhoe Dam mitigates downstream flooding by storing incoming flood water during a rainfall event and releasing these waters at a reduced flow rate downstream to reduce flood impacts. The timing of the releases is also manipulated so that the aim is for outflows from the dams to impact on downstream areas only after the peak inflows from the downstream major tributaries have passed. However this aim cannot always be achieved in practice. This is because some large floods, such as the one currently being experienced, have the potential to overflow the dam's flood storage compartment. **Should this occur, the dam would fail and the resulting damage and loss of life would be at least 100 to 1000 times greater than that currently being experienced.**

Therefore the basis of all flood operation decision making is to ensure the dam never fails. This is the reason that the dam's flood storage compartment would never be intentionally fully filled as any additional inflows after this point would result in a dam failure. At any one time, there will always be uncertainty about what rain is going to occur. Hence, we cannot use all of the flood capacity as we would not be able to release sufficient water to cater for large inflows.

2.3 What is the role of the erodible fuse plug embankments?

Another factor that impacts on flood release decision making in large events are the levels at which the erodible fuse plugs are triggered. The fuse plugs act as a safety valve to rapidly increase dam outflows if the structural safety of the dam is in danger. Loss of one or more fuse plugs severely limits the ability of the dam to mitigate the effects of future flood events that may occur prior to the fuse plug or plugs being reinstated. Reinstatement of a fuse plug following an event would take a minimum of 4 to 6 months and would require an extended period of relatively dry weather.

2.4 Why weren't pre-emptive releases undertaken prior to the start of the flood event?

In the 25 days leading up to the current event, three flood events impacting on Wivenhoe Dam were experienced, with gate releases being made on all but five of those days. The total outflow from these events was around 700,000ML.

During these events, requests were received from Councils and residents impacted by bridge closures downstream of the dam to curtail releases as soon and as quickly as possible. Additionally the 2 January end date of the flood event prior to the current event meant that significant drain down of the dam prior to the onset of the current event that commenced on 6 January 2011, was not possible without major bridge inundation downstream of the dam and without exceeding minor flood levels in the lower Brisbane River.

Additionally, a flood event was also experienced in October 2010 that resulted in a release of 750,000ML from the dam. Accordingly drain down below the dam full supply level prior to the start of the first December event would not have been possible without significant bridge inundation and without exceeding minor flood levels (as defined by BOM and BCC) in the lower Brisbane River.

Regardless, significant drain down prior to the current event would have had little impact on the peak level in Wivenhoe Dam as shown in the table below. The reason for this is that this total event inflow volume of 2,600,000 ML is well in excess of the useable flood storage combined with the available water supply storages shown in the table.

The specific impact on the Lower Brisbane River of these reduced dam levels requires the use of a complex hydraulic model. The results of this modelling would still contain a degree of uncertainty as illustrated by the difficulties in estimating the final flood peak in Brisbane during the event. This is because the rapid closure of the gates after peak inflow was achieved resulted in significant water level reductions downstream and this is difficult to model accurately.

JANUARY 2011 FLOOD			
Starting Level		Peak Height	Capacity
%	m AHD	m AHD	%
100	67.0	74.97	191
95	66.5	74.93	191
90	65.8	74.88	190
75	64.0	74.63	187
50	60.0	74.11	180

It should be noted that the possible reductions shown above are based up a unique dual peaked flood hydrograph with a volume of about 2,600,000 ML which occurred during this event. A hydrograph with the same volume but a different distribution could result in a significantly lower reduction in peak water levels.
Flood operations at the dam are also highly dependent upon the flood inflow volume and a slight variation in the flood volume could significantly reduce the benefits associated with draining down the dam prior to a flood event.

2.5 Is there a detailed record of the events associated with the current flood?

A preliminary report has been prepared and is attached to this briefing.

3 THE MANUAL OF FLOOD MITIGATION AT WIVENHOE DAM AND SOMERSET DAM

3.1 What is the Manual of Flood Mitigation and how was it developed?

The Manual of Flood Mitigation for Wivenhoe and Somerset dams in its current form was developed in 1992 during an extensive hydrological study of the Brisbane and Pine Rivers catchments by DPI, Water Resources. The final reports were subject to extensive internal review by the Water Resources Group before being reviewed by an independent review panel comprising Professor Colin Apelt, Head of Department, Department of Civil Engineering, University of Queensland and Mr Eric Lesleighter, Principal Hydraulic Engineer and Chief Engineer Water Resources, Snowy Mountains Engineering Corporation. Subsequently, the Manual was extensively reviewed during the Brisbane Valley Flood Damages Minimisation Study in 2006, with the latest comprehensive review of the Manual undertaken in 2009. Both of these reviews have included expert review panels comprising key stakeholders, with the most recent review involving representatives from DERM, BOM, BCC and SunWater.

The Manual of Flood Mitigation is prepared by Seqwater as the owner of the dam and approved and gazetted by the Chief Executive of DERM in accordance with the Water Supply Act 2008. The manual defines flood objectives procedures; roles and responsibilities; and staffing and operational requirements for flood events impacting on Wivenhoe and Somerset dams.

3.2 What is contained in the Manual?

The primary objectives of the procedures contained in the Manual are, in order of importance:

- 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 primarily, this involves minimising inundation of the seven bridges below the dam upstream of Moggill);
- 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.

During an event, the operation of the dam transitions between the following four operating strategies depending of the circumstances at the time. These procedures associated with these strategies are explained in detail in the Manual.

- **Strategy W1** – Primary consideration is given to Minimising Disruption to Downstream Rural Life.
- **Strategy W2** – Transition Phase moving from Minimising Disruption to Protecting Downstream Urban Areas.
- **Strategy W3** – Primary consideration is to Protect of Urban Areas from Inundation.
- **Strategy W4** – Primary consideration is to protecting the structural safety of the Dam.

In addition to these strategies, historical records show that there is a significant probability of two or more flood producing storms occurring in the Brisbane River system within a short time of each other. Accordingly for each flood event, the aim is always to empty stored floodwaters within seven days after the flood peak has passed through the dams.

4 REGULATORY CONTEXT

Operational procedures for flood mitigation for a dam are contained in the Flood Mitigation Manual approved under sections 370 to 374 of the *Water Supply (Safety and Reliability) Act 2008* (Water Supply Act). Under section 370 of the Water Supply Act, Seqwater as the owner and operator of Wivenhoe and Somerset Dams is required to prepare a Flood Mitigation Manual. The Chief Executive (CE) of DERM (or his delegate) approves the Flood Mitigation Manual, and the approval is notified in the Queensland Government Gazette. Approval can be for a period of up to five years, after which the approval needs to be renewed. There are no decision-making criteria specified in the Water Supply Act for the CE to take into account when approving the Flood Mitigation Manual.

The Flood Mitigation Manual requires, amongst other matters:

1. Flood operations to be conducted in accordance with manual's provisions, unless Seqwater considers that it is necessary to depart from the procedures of the Flood Mitigation Manual to meet the flood mitigation objectives of the Flood Mitigation Manual. The Flood Mitigation Manual sets out a consultation and approval process through Seqwater's Chair and the CE for departures from the Flood Mitigation Manual. This discretion was not exercised in the January 2011 flood event.
2. Flood operations to be under the control of CE-approved engineers (who are highly qualified and experienced)
3. Annual reporting on the preparedness and status of the flood control system for flood operations, and the training of the personnel who manage the flood events.
4. Reporting on the flood operations during flood events.
5. Reviews after flood events such as the January 2011 event, and a Seqwater report containing details of the procedures used, the reasons for such and other pertinent information. Seqwater must forward this report to the CE within six weeks of the completion of a flood event.

Section 374 of the Water Supply Act protects the CE and Seqwater from liability for complying with the Flood Mitigation Manual. It states:

> *(1) The chief executive or a member of the council does not incur civil liability for an act done, or omission made, honestly and without negligence under this part.*
>
> *(2) An owner of a dam who observes the operational procedures in a flood mitigation manual, approved by the chief executive, for the dam does not incur civil liability for an act done, or omission made, honestly and without negligence in observing the procedures.*

During November 2010, Commonwealth, State and local government agencies developed a *Protocol for Communication of Flooding Information for the Brisbane River Catchment – including Floodwater Releases from Wivenhoe and Somerset Dams* to "*ensure the provision of consistent and robust information to the community*". This is separate from the Flood Mitigation Manual, is not legally binding and is not subject to regulatory approval/review.

Some DERM staff, because of their specialist skills, work in the Flood Operations Centre that Seqwater activates to manage such events in accordance with the Flood Mitigation Manual. The Flood Operations Centre is not involved in any of the regulatory decisions concerning the dams or are members of the Office of the Water Supply Regulator,

Department of Environment and Resource Management, which undertakes the CE's regulatory functions.

5 SEQWATER REPORT

It is recommended that the process and content for reports required for this event be:

- In the short term, utilise this report attached to this briefing note as the basis for communications and discussion.
- Prepare any Interim Reports as agreed to provide information and input as required.
- Seqwater prepare a Comprehensive Report as per the existing regulatory requirements of the Act and the gazetted manual and any requirements of the Dam Safety Regulator. This would be done within 6 weeks of the closure of the current event as per the manual. This timeframe is subject to any new mobilisation of the Flood Operations Centre. The Table of Contents would include:
    - Introduction
    - Flood Event Summary
    - Mobilisation and Staffing
    - Event Rainfall
    - Inflow and Release Details
    - Data Collection System Performance
    - Data Analysis Performance
    - Communication
    - Flood Management Strategies and Manual Compliance
    - Improvements in data collection systems, practices and processes.
    - improvements by interacting agencies
    - Review of factors impacting on the protection of urban areas
    - Recommendations & Conclusions
- The report would then be reviewed by the Dam Safety Regulator in conjunction with any peer review they require. The review should cover:
    - Were the provisions of the manual complied with?
    - What improvements to either facilities e.g. stream gauges, or work practices, are desirable to improve Sewater's ability to predict inflows into the dams.
    - Are improvements to either Seqwater's facilities or work practices desirable to improve Seqwater's ability to manage events? For example, investigations to raise the dam to improve its flood storage capacity, If so, what are they and their implications

- Are changes to the facilities or work practices of other organisations desirable to improve Seqwater's abilities to manage these events?
- whether it is worth investigating increasing the flood capacity of Wivenhoe
- whether the Brisbane River crossings which act, under some situations as a constraint on the releases from Wivenhoe, should be replaced by bridges. For example if the smallest could pass , for example, 2,500 cumecs, then this could enable higher releases under some circumstances.
- Whether the policy of draining the flood compartment within 7 days should be modified.
- Given the manual's order of priorities i.e. protection of the dam etc, are any changes in the flood release strategies for either dam desirable? If so, what are they, and their implications

- Based on this review, a review of the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam would occur utilising an expert panel of review including representatives of DERM, Seqwater, BoM, affected Local Governments and other stakeholders as necessary.

seqwater

WATER FOR LIFE

JANUARY 2011 FLOOD EVENT

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1 INTRODUCTION

Wivenhoe Dam was constructed by the Queensland Government between 1977 and 1984. The dam is a 56 m AHD high and 2.3 kilometre long earth and rock embankment separated into two parts by a concrete gravity spillway. The spillway is controlled by 5 radial gates, each 12.0 metres wide by 16.0 m AHD high. Two saddle dam embankments are located on the left side of the reservoir.

The dam spillway capacity was upgraded in 2005. This was done primarily through the construction of a 164 metre wide secondary spillway through the right abutment of the existing dam. This spillway contains three erodible earth fill fuse plug embankments that are initiated at different dam levels in excess of EL 75.6.

The dam has two main functions by providing:

- A 1,165,000 ML storage at full supply level (FSL EL 67.0) providing an urban water supply for Brisbane and surrounding areas;

- Flood mitigation in the Brisbane River by providing a dedicated flood storage volume of 1,450,000 ML up to EL77 (this flood level was increased as part the 2005 upgrade to allow a water level of EL80m and a temporary flood storage volume of 1,966,000 ML with all fuse plugs initiated and the dam at the point of failure).

The dam has an EXTREME hazard classification under ANCOLD guidelines because of the significant development downstream in the Brisbane and Ipswich metropolitan areas, with the population at risk in the event of a dam failure numbering in the hundreds of thousands.

In accordance with the Queensland Regulatory program for dam spillway upgrades, a further upgrade of Wivenhoe Dam for dam safety reasons only is scheduled to occur prior to 2035 to enable the dam to safely pass the Probable Maximum Flood. This work will involve the reconstruction of Saddle Dam 2 as a fuse plug spillway.

Wivenhoe Dam is in excellent condition. Comprehensive Dam Safety reviews undertaken in accordance with ANCOLD guidelines have been undertaken in 1997 (Gutteridge, Haskins & Davey Pty Ltd), 2003 (Wivenhoe Alliance), 2006 (NSW Department of Commerce), 2009 (GHD) and September 2010 (Seqwater). The reports concluded that the design of the dam is in accordance with modern day standards and that there are no significant outstanding design or construction issues that require investigation.

2 WIVENHOE DAM FLOOD MITIGATION AND FLOOD OPERATIONS

2.1 Flood Mitigation

The Brisbane River catchment covers an area of approximately 14,000 square kilometres of which about half is below Wivenhoe Dam. Maximum overall flood mitigation effect is achieved by operating Wivenhoe Dam in conjunction with Somerset Dam. Although Somerset and Wivenhoe Dam reduce flooding in Brisbane City, major flooding can still occur. The Lockyer-Laidley Valley drains into the Brisbane River through Lockyer Creek that enters the Brisbane River just downstream of Wivenhoe Dam near Lowood. Another major tributary, the Bremer River, flows into the Brisbane River at Moggill. Wivenhoe Dam has no control over inflows into the Brisbane River from both these major tributaries.

Wivenhoe Dam mitigates downstream flooding by storing incoming flood water during a rainfall event and releasing these waters at a reduced flow rate downstream to minimise flood impacts. The timing of the releases is also manipulated so that the aim is for outflows from the dams to impact on downstream areas only after the peak inflows from the downstream major tributaries have passed. However, this aim cannot always be achieved in practice. This is because some large floods, such as the one currently being experienced, have the potential to overflow the dam's flood storage compartment. **Should this occur, the dam would fail and the resulting damage and loss of life would be at least 100 to 1000 times greater than that currently being experienced.**

Therefore the basis of all flood operation decision making is to ensure the dam never fails. This is the reason that the dam's flood storage compartment would never be intentionally fully filled as additional inflows after this point would result in a dam failure. Similarly, there will be uncertainty on future rainfall that could occur which could not be releases if there was insufficient flood storage which could not be stored or released.

Another factor that impacts on flood release decision making in large events are the levels at which the erodible fuse plugs are triggered. Loss of one or more fuse plugs severely limits the ability of the dam to mitigate the effects of future flood events that may occur prior to the fuse plug or plugs being reinstated. Reinstatement of a fuse plug following an event would take a minimum of 4 to 6 months and would require an extended period of relatively dry weather.

2.2 Flood Operations

A real time flood monitoring and forecasting system has been established in the Wivenhoe and Somerset Dam catchments. This system employs radio telemetry to collect, transmit and receive rainfall and stream flow information. The system consists of around 230 field stations that automatically record rainfall and/or river heights at selected locations in the dam catchments. Most of these field stations are owned by Seqwater with the remainder belonging to other agencies.

The rainfall and river height data is transmitted to Seqwater's Flood Operations Centre in real time. Once received in the Flood Operations Centre, the data is processed using a Real Time Flood Model (RTFM) to estimate likely dam inflows and evaluate a range of possible inflow scenarios based on forecast and recorded rainfall in the dam catchments. The RTFM is a suite of hydrologic computer programs that utilise the real time data to assist in the operation of the dams during flood events.

Seqwater engineers use the RTFM for flood monitoring and forecasting during flood events to operate the dams in accordance with a Manual of Flood Mitigation (the origin of and objectives and procedures contained in the Manual of Flood Mitigation are explained in the following section of this document). Releases of water from the dams are optimised to minimise the impacts of flooding in accordance with the objectives and procedures contained in a Manual of Flood Mitigation.

The RTFM and data collection network performed well During the January 2011 event, with no failures experienced that compromised the ability of Seqwater to operate the dam.

3 MANUAL OF FLOOD MITIGATION FOR WIVENHOE AND SOMERSET DAMS

The Manual of Flood Mitigation for Wivenhoe and Somerset Dams, in its current form, was developed in 1992 during an extensive hydrological study of the Brisbane and Pine Rivers catchments by DPI, Water Resources. The final reports were subject to extensive internal review by the Water Resources Group before being reviewed by an independent review panel comprising Professor Colin Apelt, Head of Department, Department of Civil Engineering, University of Queensland and Mr Eric Lesleighter, Principal Hydraulic Engineer and Chief Engineer Water Resources, Snowy Mountains Engineering Corporation.

Subsequently, the Manual was extensively reviewed during the Brisbane Valley Flood Damages Minimisation Study in 2006, with the latest comprehensive review of the Manual undertaken in 2009. Both of these reviews have included expert review panels comprising key stakeholders, with the most recent review involving representatives from DERM, BOM, BCC and SunWater.

The Manual of Flood Mitigation is prepared by Seqwater as the owner of the dam and approved and gazetted by the Chief Executive of DERM in accordance with the Water Supply Act 2008. The manual defines flood objectives procedures; roles and responsibilities; and staffing and operational requirements for flood events impacting on Wivenhoe and Somerset dams.

The primary objectives of the procedures contained in the flood manual are, in order of importance:

- 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 primarily, this involves minimising inundation of the seven bridges below the dam upstream of Moggill);
- 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.

During an event, the operation of the dam transitions between the following four operating strategies depending of the circumstances at the time. These procedures associated with these strategies are explained in detail in the Manual.

- **Strategy W1** – Primary consideration is given to Minimising Disruption to Downstream Rural Life. Under this strategy, the predicted water level is below 68.50 m AHD and the maximum release is 1,900m3/s.

- **Strategy W2** – Transition Phase moving from Minimising Disruption to Protecting Downstream Urban Areas. Under this strategy, the water level is predicted to be between 68.5 and 74.0 m AHD and the maximum release is less than 3,500m3/s.

- **Strategy W3** – Primary consideration is to Protect of Urban Areas from Inundation. Under this strategy, the water level is predicted to be between 68.5 and 74.0 m AHD but the maximum release is less than 4,000m3/s.

- **Strategy W4** – Primary consideration is to protecting the structural safety of the Dam. Under this strategy, the water level is predicted to exceed 74.0 m AHD and there is no limit to the maximum release. Consideration is given to managing flood releases to avoid fuse plug initiation if at all possible as this would compromise flood mitigation capacity in the short to medium term.

In addition to these strategies, historical records show that there is a significant probability of two or more flood producing storms occurring in the Brisbane River system within a short time of each other. Accordingly for each flood event, the aim is always to empty stored floodwaters within seven days after the flood peak has passed through the dams.

4 JANUARY 2011 FLOOD EVENT

4.1 Background

In the 25 days leading up to the current event, three flood events impacting on Wivenhoe Dam were experienced, with gate releases being made on all but five of those days. The total outflow from these events was around 700,000ML. The details of these events are as follows:

EVENT	EVENT START DATE	EVENT END DATE	VOLUME RELEASED (ML)
1	13/12/2010	16/12/2010	70,000
2	17/12/2010	24/12/2010	150,000
3	26/12/2010	02/01/2010	470,000

During these events, requests were received from Councils and residents impacted by bridge closures downstream of the dam to curtail releases as soon and as quickly as possible. Additionally the 2 January end date of the flood event prior to the current event meant that significant drain down of the dam prior to the onset of the current event that commenced on 6 January 2011, was not possible without major bridge inundation downstream of the dam and without exceeding minor flood levels in the lower Brisbane River.

Additionally, a flood event was also experienced in October 2010 that resulted in a release of 750,000ML from the dam. Accordingly drain down below the dam full supply level prior to the start of the first December event would not have been possible without significant bridge inundation and without exceeding minor flood levels (as defined by BOM and BCC) in the lower Brisbane River.

Regardless, significant drain down prior to the current event would have had little impact on the peak level in Wivenhoe Dam as shown in the table below. The reason for this is that this total event inflow volume of 2,600,000 ML is well in excess of the useable flood storage combined with the available water supply storages shown in the table.

The specific impact on the Lower Brisbane River of these reduced dam levels requires the use of a complex hydraulic model. The results of this modelling would still contain a degree of uncertainty as illustrated by the difficulties in estimating the final flood peak in Brisbane during the event. This is because the rapid closure of the gates after peak inflow was achieved resulted in significant water level reductions downstream and this is difficult to model accurately.

JANUARY 2011 FLOOD			
Starting Level		Peak Height	Capacity
%	m AHD	m AHD	%
100	67.0	74.97	191
95	66.5	74.93	191
90	65.8	74.88	190
75	64.0	74.63	187
50	60.0	74.11	180

It should be noted that the possible reductions shown above are based on a dual peaked flood hydrograph with a volume of about 2,600,000 ML which occurred during this event. A hydrograph with the same volume but a different distribution could result in a significantly lower reduction in peak water levels.
Flood operations at the dam are also highly dependent upon the flood inflow volume and a slight variation in the flood volume could significantly reduce the benefits associated with draining down the dam prior to a flood event.

4.2 Event Decision Making

The following table contains a summary of the key decisions points associated with the current event. As at 16 January 2011, the event remains in progress.

DATE AND TIME	FLOOD EVENT MILESTONE
07:00 06/01/2011 (Thursday)	Rainfall is experienced in the dam catchments that will result in flood releases, however Wivenhoe releases are delayed for 24 hours to allow Lockyer Creek flood flows to pass downstream and prevent the isolation of the community dependent of Burtons Bridge. The forecast is for 150mm over the next 24 hours.
15:00 07/01/2011 (Friday)	Wivenhoe releases commence, with operational strategy W1 in use. Rainfall for the next four days is estimated to be between 140mm and 300mm, with a forecast for rain easing on Tuesday 11 January 2011. All bridges downstream of the dam with the exception of Fernvale Bridge and Mt Crosby Weir Bridge are expected to be inundated for a number of days.

06:00 09/01/2011 (Sunday)	Moderate to heavy rain periods forecast until Tuesday, but both Wivenhoe and Somerset dam levels were falling slowly, with Somerset at 1.27 m AHD above FSL and Wivenhoe 1.58 m AHD above FSL.
15:30 09/01/2011 (Sunday)	Following significant rain during the day a meeting of Duty Engineers is held. The QPF issued at 16:00 indicates 50mm to 80mm over the next 24 hours. Based on this forecast, it is anticipated that dam levels can be held to a maximum of 3.50 m AHD above FSL in Somerset and 5.5 m AHD above FSL in Wivenhoe. However, by 19:00 it was apparent that both Fernvale Bridge and Mt Crosby Weir Bridge would be inundated by the combined dam releases and Lockyer Creek flows and that the operational strategy had progressed to W2.
06:30 10/01/2011 (Monday)	Rainfall continued during the night and based on rainfall on the ground it was apparent the operational strategy had progressed to W3.
06:30 10/01/2011 (Monday)	Rainfall continued during the day but based on rainfall on the ground, operational strategy W3 remained in use. However it was apparent that any further heavy rain would result in progression of the operational strategy to W4.
08:00 11/01/2011 (Tuesday)	Rainfall continued during the night with isolated heavy falls in the Wivenhoe Dam catchment area and based on rainfall on the ground it was apparent the operational strategy would soon progress to W4 with Wivenhoe Dam exceeding 8.00 m AHD above FSL. The objective now was to limit outflows and subsequent flood damage to urban areas, while ensuring the structural safety of the dam.
11:00 11/01/2011 (Tuesday)	Rapid inflows were experienced in Wivenhoe Dam, with the dam rising almost a metre in eight hours. Releases were increased until the dam level stabilised in accordance with Strategy W4. Computer models were not reflecting actual dam inflows due to intense point rainfalls in the immediate catchment around the dam. Falls are estimated to be similar to those experienced at both Toowoomba and Upper Lockyer the previous day and are falling outside and between existing rain gauges.
21:00 11/01/2011 (Tuesday)	Wivenhoe Dam peaked. Peak release of 7450 cumecs with a level of 0.7 metres below fuse plug trigger.
22:00 11/01/2011	Wivenhoe Dam releases were closed off as quickly as possible over the

(Tuesday)	next 11 hours, while ensuring water levels in the dam did not rise further and initiate a fuse plug embankment.
08:00 12/01/2011 (Wednesday)	Minimum possible release level reached, with inflows matching outflows. Further reductions in release rate would likely cause the dam level to rise.
21:00 13/01/2011 (Thursday)	The 7 day dam drain down is commenced as Lockyer Creek and Bremer River peaks pass the Lower Brisbane area. Maximum release target is the limit of damaging floods in Brisbane being 3500 cumecs.
09:00 17/01/2011 (Monday)	Drain down continues, with released expected to cease on Wednesday 19 January 2011 unless further rainfall is experienced.

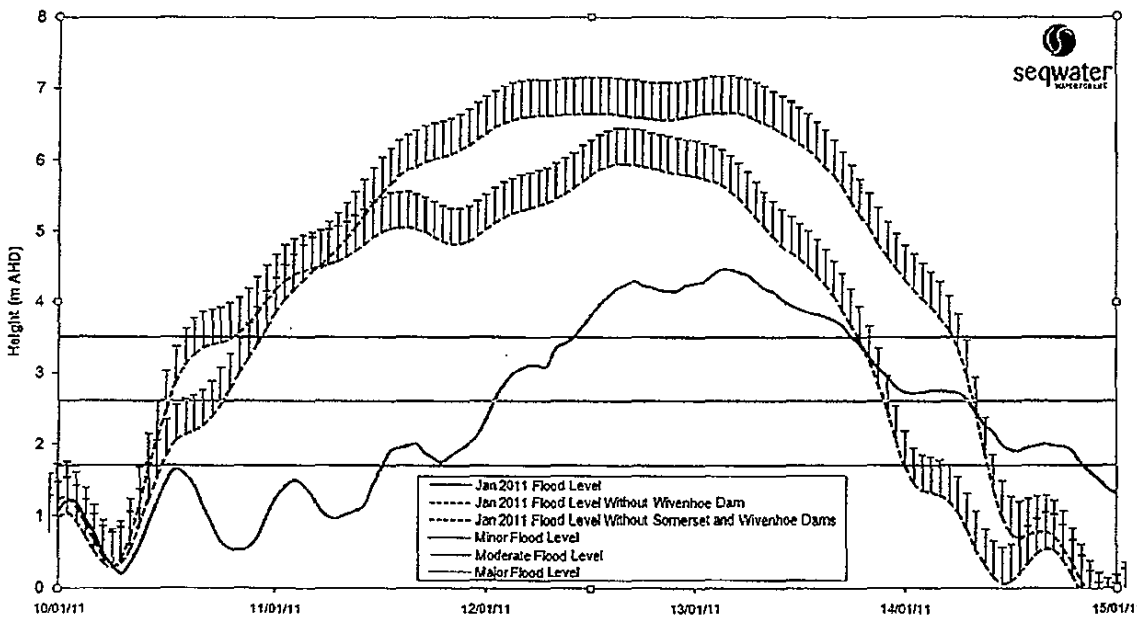
4.3 Flood Mitigation Benefits of Wivenhoe Dam

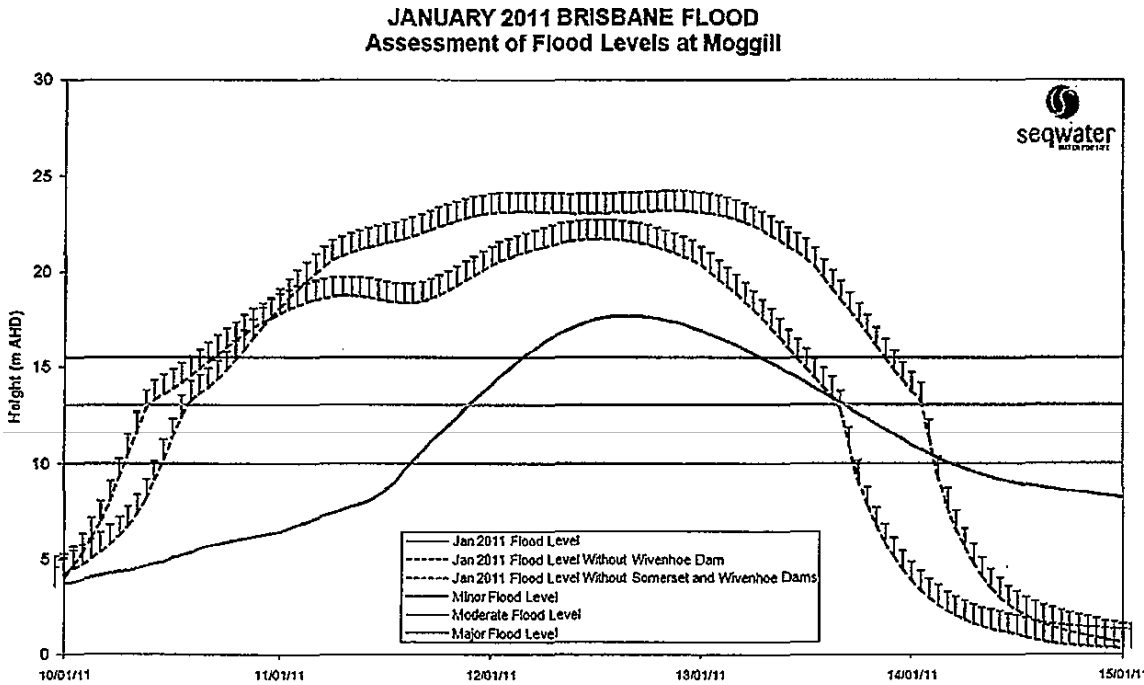
The following graphs demonstrate the significant benefits of Wivenhoe Dam in mitigating the current flood event, with reductions in flood peak of up to 2.5 metres in the City area and up to 5.5 metres in the Moggill area further upstream.

This equates to significant reduction in the potential for loss of life as well as saving in damages in the order of up to $1.6 billion based on current damage curves. Up to 13,000 more properties would have been impacted by the event without the Dam.

The time at which flood levels remained elevated above major levels has also been reduced by up to 3 days by the dam. This has significant benefits to impact on the population of the city, property damage and the recovery operation.

JANUARY 2011 BRISBANE FLOOD
Assessment of Flood Levels at Brisbane City





The strategy adopted to quickly close off releases once the peak in the dam had been reached and rain stopped falling certainly reduced the predicted flood peak by at least one metre in the lower Brisbane River area. This was carried out because the releases had stopped the dam from rising and careful monitoring allowed rapid reduction of releases while ensuring fuse plug initiation did not occur.

This notion is supported by BOM.

5 EVENT REVIEW

Under the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam that are approved and gazetted by the Department of Environment and Resource Management, there is a regulatory requirement that a report must be prepared as per the below wording:

"Seqwater must prepare a report after each Flood Event. The report must contain details of the procedures used, the reasons therefore and other pertinent information. Seqwater must forward the report to the Chief Executive within six weeks of the completion of the Flood Event."

Such a report was prepared for the flood events of February and March 2010 and copies are available. A copy of the Table of Contents of that report is included as Appendix 1. For this event, the report would be a comprehensive summary of all procedures, actions, outcomes and processes during the event.

It is recommended that the process and content for reports required for this event be:

- In the short term, utilise this report attached to this briefing note as the basis for communications and discussion.
- Prepare any Interim Reports as agreed to provide information and input as required.
- Seqwater prepare a Comprehensive Report as per the existing regulatory requirements of the Act and the gazetted manual and any requirements of the Dam Safety Regulator. This would be done within 6 weeks of the closure of the current event as per the manual. This timeframe is subject to any new mobilisation of the Flood Operations Centre. The Table of Contents would include:
    - Introduction
    - Flood Event Summary
    - Mobilisation and Staffing
    - Event Rainfall
    - Inflow and Release Details
    - Data Collection System Performance
    - Data Analysis Performance
    - Communication
    - Flood Management Strategies and Manual Compliance
    - Improvements in data collection systems, practices and processes.
    - improvements by interacting agencies

- Review of factors impacting on the protection of urban areas
- Recommendations & Conclusions

- The report would then be reviewed by the Dam Safety Regulator in conjunction with any peer review they require. The review should cover:
  - Were the provisions of the manual complied with?
  - What improvements to either facilities e.g. stream gauges, or work practices, are desirable to improve Sewater's ability to predict inflows into the dams.
  - Are improvements to either Seqwater's facilities or work practices desirable to improve Seqwater's ability to manage events? For example, investigations to raise the dam to improve its flood storage capacity, If so, what are they and their implications.
  - Are changes to the facilities or work practices of other organisations desirable to improve Seqwater's abilities to manage these events?
  - whether it is worth investigating increasing the flood capacity of Wivenhoe
  - whether the Brisbane River crossings which act, under some situations as a constraint on the releases from Wivenhoe, should be replaced by bridges. For example if the smallest could pass , for example, 2,500 cumecs, then this could enable higher releases under some circumstances.
  - Whether the policy of draining the flood compartment within 7 days should be modified.
  - Given the manual's order of priorities i.e. protection of the dam etc, are any changes in the flood release strategies for either dam desirable? If so, what are they, and their implications
- Based on this review, a review of the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam would occur utilising an expert panel of review including representatives of DERM, Seqwater, BoM, affected Local Governments and other stakeholders as necessary.

Appendix A

FINAL REPORT – FLOOD EVENTS AT WIVENHOE, SOMERSET AND NORTH PINE DAMS FOR FEBRUARY AND MARCH 2010

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Queensland Government

Ref CTS 19311/10

25 OCT 2010

Mr Gary Humphrys
Chair
SEQ Water Grid Manager
PO Box 16205
CITY EAST QLD 4002

Office of the
Minister for Natural Resources,
Mines and Energy and
Minister for Trade

Dear Mr Humphrys

I write in relation to seeking advice regarding options to and benefits of releasing water from key storages in anticipation of major inflows over the coming summer.

I understand that the key Water Grid storages are at 100 per cent of storage capacity going into the traditional wet season, with forecasts of higher than median rainfall and the prospect of multiple flood events.

I am also advised that our water supply is more secure than ever before, due to storages being full, key Water Grid projects completed and ongoing water efficiency.

I seek your urgent advice about whether this water security provides an opportunity to reduce the volume stored in key dams as a means of reducing the severity, frequency and duration of flooding in downstream areas.

In doing so, I note that recent releases from Wivenhoe Dam have resulted in significant inconvenience and isolation for residents in some downstream areas. With the catchments saturated, I understand that even quite minor rainfall events will result in further water releases and further inconvenience for these residents.

By end November 2010, I would appreciate your advice as to the available options and the likely benefits. At a minimum, you should review the operation of Wivenhoe, North Pine and Leslie Harrison dams. At least for Leslie Harrison Dam, this would be a return to standard operating procedures prior to the drought, when the dam was routinely drawn down to 95 per cent of capacity to minimise the impacts of storms on downstream residents.

I also seek your confirmation that these options would not significantly impact upon our current water security, measured as the probability of needing to reintroduce Medium Level Restrictions over the next five to ten years.

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Queensland Government

Office of the
Minister for Natural Resources, Mines and Energy and Minister for Trade

I emphasise that this is only a temporary measure, reflecting that dams are full prior to the commencement of the traditional wet season. I expect that your advice will include a clear date or trigger beyond which dams will be allowed to fill to their full supply level.

Thank you in advance for your assistance.

Should you have any further enquiries, please feel welcome to contact Mr John Bradley, Director General, Department of Environment and Resource Management on [redacted]

Yours sincerely

[redacted]

STEPHEN ROBERTSON MP

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TRIM ref: D/10/7953

24 December 2010

Hon Stephen Robertson MP
Minister for Natural Resources, Mines and Energy
and Minister for Trade
PO Box 15216
Brisbane Qld 4001

Dear Minister

I am pleased to respond to your letter of 25 October 2010 regarding options to and benefits of releasing water from key storages in anticipation of major inflows over the current wet season. Our advice follows, based on discussions with Seqwater.

Only four of the dams in South East Queensland region are gated, with the ability to release significant amounts of water in anticipation of major inflows. These are Wivenhoe, Somerset, North Pine and Leslie Harrison dams.

Detailed operational procedures have been approved for each of the gated dams. The dams will continue to be operated in accordance with these procedures. These procedures generally relate to the management of the dams and should be managed above Full Supply Level. This advice relates to the water security aspect of the management of the dams below Full Supply Level.

Based on information currently available, Seqwater has advised that releasing water to below Full Supply Level may provide some benefits in terms of reduced community and operational impacts during minor inflow events, such as has occurred over the past month. For medium and major flood events, it considers that pre-emptive releases will provide negligible benefits.

Informed by this advice, the SEQ Water Grid Manager has advised Seqwater that, from a water security perspective, it has no in-principle objection to minor releases from Wivenhoe, Somerset and North Pine dams to minimise the operational and community impacts of gate releases. Specifically, it has advised that it has no in-principle objection to:

- Wivenhoe and Somerset dams being drawn down to 95 per cent of their combined Full Supply Level
- North Pine Dam being drawn down to 97.5 per cent of its Full Supply Level.

The SEQ Water Grid Manager has assessed the water security implications of the release to be negligible, having no impact on our ability to meet the risk criteria specified in the System Operating Plan or our ability to meet our supply obligations to Grid Customers. From a water security perspective, the Queensland Water Commission has also confirmed that it does not have any objections to the potential release.

Please note that these arranges are intended to apply for the current wet season only, taking into account the level of storages and the rainfall forecasts over coming months.

For future wet seasons, the SEQ Water Grid Manager will continue to work with Seqwater to investigate the optimal arrangements. In particular, we propose to further investigate options that may reduce the frequency or duration of intermediate level flows (between 1,900 and 3,500 cubic metres per second). In addition, we recommend that the investigations with the Queensland Water Commission to examine the opportunity of raising the full supply level of Wivenhoe Dam for water supply be expanded to include options involving the release of the additional water once major inflows are forecast.

I trust that this advice is sufficient. If you have any questions, please do not hesitate to contact Mr Dan Spiller, Director Operations, by telephone on [redacted] or by email on [redacted]

Yours sincerely

[redacted]

Gary Humphrys
Chair

ATTACHMENT

Wivenhoe and Somerset dams

Wivenhoe Dam can store up to 1.15 million litres (ML) of drinking water. In addition, it has the capacity to store an additional 1.45 ML of flood water.

While large, the flood compartment can be filled within days. For example, following heavy rainfall in October 2010 Wivenhoe Dam received inflows equivalent to almost half of the flood storage compartment capacity in just a few days.

Several factors influence flood release strategies for Wivenhoe and Somerset dams.

First, rain events that have caused flooding have historically been prolonged events over several days, often with a second event occurring several days to a week after the first. As a result, the operational procedures for the dam are designed to ensure that all water held in the flood compartments is released within seven days of a rain event, ensuring that the flood compartment is available for any future inflows.

Secondly, the dam only controls flood waters from part of the Brisbane River catchment area. About 50 per cent of the catchment area of the Brisbane River is upstream of the Wivenhoe Dam wall, and can be potentially controlled by it. No flood mitigation structures exist for most of the potential run-off from the other 50 per cent of the catchment area.

Third, the Bureau of Meteorology has had limited success in plotting rainfall distribution accurately to assess where most flooding risk lies above or below the dam wall. Historical floods have demonstrated that flooding can occur from both. For example, the 1974 flood flows primarily occurred below the dam wall whilst the 1890's event occurred above the dam wall. As a result, when releasing water from Wivenhoe Dam it is very important to predict and monitor below the dam wall flows so as to understand combined river flows that cause flood impacts.

Taking these factors into account, the flood release strategy for Wivenhoe and Somerset dams has a hierarchy of objectives:

- Ensure the structural safety of the dam
- Provide optimum protection of urbanised areas from inundation
- Minimise disruption to rural life
- Retain full supply level after a flood event
- Minimise impacts to flora and fauna during the drain down phase.

Within this framework, flood releases from Wivenhoe Dam typically fall into two categories of flood events based on the impact they cause when combined with below the dam wall catchment runoff:

- Larger events typically involving combined river flows greater than 3,500 cubic meters per second measured at Moggill. These events would have flood impacts on

urban areas in Brisbane. This scale of release has not been required since Wivenhoe Dam was completed.

- Smaller events with combined river flows of less than 1,900 cubic meters per second measured at the Mt Crosby weir which can inundate up to seven rural bridges isolating up to 50 households and causing inconvenience to many more. There has been six of these events since 1984, when Wivenhoe Dam was completed.

Our assessment of the benefits of lowering dam storage levels to reduce flooding impacts is below for these two event types.

Large events

Seqwater has advised that releases of greater than 3,500 cubic metres per second (m3/s) from Wivenhoe Dam are likely to impact on urban areas in Brisbane. Events of this nature have not been experienced since Wivenhoe Dam was completed in 1984.

Seqwater has advised that:

- pre-emptive releases are likely to have negligible impacts on the extent of these impacts
- any impacts would require releases of at least 250,000 ML. This is equivalent to a release of about 16 per cent of the combined storage capacity of Wivenhoe and Somerset dams.

A pre-emptive release of this scale is not recommended, based on information currently available. The potential water security impacts are considered to be more significant than the negligible benefits. These potential security impacts include costs associated with the earlier or avoidable operation of the desalination facility at capacity, as well as the increased probability of triggering the implementation of a drought response plan.

More detailed investigation of opportunities to actively manage flood storage is recommended, including options to increase flood supply level on a temporary basis. These investigations need to be led by Seqwater, and involve the Bureau of Meterology, Councils and the SEQ Water Grid Manager.

In particular, t has been identified that it is worth investigating the impacts on downstream flooding for intermediate level flows (flows between 1900 and 3500 cm^3/s).

Seqwater will undertake extensive investigations for the Queensland Water Commission in early 2011 to examine the opportunity of raising the full supply level of Wivenhoe Dam for water supply. We will recommended that the scope of this work be widened to consider the benefits of pre-lowering storage levels based on mid range rainfall events and the reduced impacts to river levels and subsequent property impacts. It is noted that predicting rainfall intensity and location, even as events are about to occur has not been accurate, however the Bureau of Meteorology is improving its methods.

Smaller events

Pre-emptive releases from Wivenhoe Dam may reduce the impacts of minor gate releases (strategies W1A to W1E in the operational procedures).

Minor gate releases may result in the closure of up to six bridges, isolating up to 50 dwellings and inconveniencing many more. As stated in existing flood management plans, releases should be managed to minimise the impacts on these residents. Over the immediate term, Councils have requested that bridge closures be avoided over the Christmas to New Year period, if at all possible. In addition:

- There are resource implications involved in the activation of the flood control centre. Under flood management plans, the centre must be staffed by suitability qualified officers at all times during gate releases. There are currently only four quality duty engineers, who have staffed the flood centre for much of period since the initial release in October.
- Gate releases during the Christmas holiday period would result in closure of dams to water based activities, impacting on up to 150,000 people who are expected to use the recreational facilities over the holiday period.

The Water Grid Manager has advised Seqwater that, from a water security perspective, it would not object to water being released from Wivenhoe and Somerset dams to 95 per cent of storage capacity at any time until end March 2010.

Under this recommendation, storage levels could potentially be reduced by up to about 77,250 ML. This is equivalent to the amount of water released between 13 and 16 December 2010, through a single gate.

Pre-emptive releases will be managed so as to minimise the likelihood of gate releases due to small storms and local rainfall. Storage capacity will usually be reduced through a combination of:

- Extended gate releases, especially for strategy W1C. For comparison, up to 130,000 ML/day was released during in November and mid December 2010. At this rate, the additional releases could occur in about half a day.
- Ongoing gate releases of up to 30,000 ML/day, which do not isolate any residents but can inundate some lower bridges that cause inconvenience.
- Ongoing valve release of up to about 4,300 ML/day, which can be maintained without inundate any bridges.

Actual releases would be decided by Seqwater based on operational considerations and in accordance with its statutory and regulatory obligations.

Water security impacts

The water security impacts of releases will be zero if the dams fill over the remainder of the wet season. Current forecasts indicate that there is a high probability of this occurring:

- Heavy rainfall is forecast over the Christmas holiday period, as noted above.
- Over the remainder of the wet season, advice from the Bureau of Meteorology is that sea surface temperatures are likely to remain at levels typical of a La Niña event into the first quarter of 2011, with the majority of the models indicating the event will gradually weaken over the coming months.

The water security impacts will be minimal, even if there were no further inflows to the dams. Modelling indicates that the reduction would have a minimal impact on the probability of key water Grid storages falling to 40 per cent of capacity over the next five years.

North Pine and Leslie Harrison dams

North Pine and Leslie Harrison dams do not have flood mitigation potential. Once the dams have reached Full Supply Level, all water flows into the dam must be released to protect the structural safety of the dam.

Seqwater has advised that, without major releases, there are negligible benefits to reducing volumes stored in North Pine or Leslie Harrison dams for the purposes of reducing the extent or duration of any downstream flooding impacts.

For North Pine Dam, there may be some operational and community benefits to minor releases to below Full Supply Level in some circumstances. Any gate operation at North Pine Dam results in inundation of Youngs Crossing Road, which isolates a number of residents. These impacts are currently being minimised by releasing from North Pine Dam at night. With further rainfall forecast, Seqwater may choose to reduce the level to below Full Supply Level in order to reduce the frequency of night releases or the likelihood of releases being required during the day.

For this dam, the SEQ Water Grid Manager has advised Seqwater that, from a water security perspective, it would not object to water being released to 97.5 per cent of storage capacity at any time until end March 2010.

For Leslie Harrison Dam, gate operations do not impact on public roads and generally only inconvenience the general public during large flood events. There is no scope to reduce this inconvenience through small pre-emptive releases. Accordingly, no in-principle approval be made for pre-emptive releases from this dam.

P.O. Box 205, BELROSE WEST NSW 2085
[redacted]
ABN: 56154707619
brian cooper consulting

12 January 2011

Mr. Barry Dennien
CEO, SEQ Water Grid Manager
PO Box 16205
City East QLD 4002

Dear Barry,

This letter report:

- presents my final findings on a review of the operation of Wivenhoe Dam (including controlled releases) for compliance against the Flood Mitigation Manual for the period 12 December 2010 to date (Flood Event), and;
- provides advice on the prudence and appropriateness of the decisions and actions taken during the Flood Event regarding the operation of Wivenhoe Dam in light of the Flood Mitigation Manual's requirements and the circumstances of the Flood Event.

The report follows on from my preliminary report sent to you earlier today. The findings and advice are provided on the basis of information provided by SEQ Water Grid Manager which comprised the Flood Mitigation Manual and Technical Situation Reports. The latter were daily (sometimes twice daily) reports for the subject period. They gave a log of rainfall over the dam catchments and the downstream river (Lockyer Ck. and Bremer R.) catchments; inflows to Somerset and Wivenhoe Dams; storage levels; releases from the dams; details of the operation of gates and other outlets (gate openings/discharges); proposed changes in operating strategies and impacts on the various access crossings downstream of Wivenhoe Dam. In reviewing the Technical Situation Reports, I prepared a spreadsheet (see separate attachment of Excel spreadsheet *Tech Reports – Summary*, summarising the reports so that a timeline of the Flood Event could be seen at a glance. This provided a good overview of the Flood Event as it unfolded and showed what information may or may not have been included in a particular report. The Queensland Director Dam Safety (Water Supply) informed me that the Flood Operation Logs contain much more detailed information including details of the communications that were carried out and some of the more detailed information that is not necessarily included in the Technical Situation Reports. I have been provided with a draft of the "*Protocol for the Communication of Flooding Information for the Brisbane River Catchment – Including Floodwater Releases from Wivenhoe and Somerset Dams*" developed in October/November last year and currently being used. The Technical Situation Reports appear to have been an outcome of that Protocol.

The various requirements and required actions detailed in the Flood Mitigation Manual are summarised in the Table given in Attachment A. The Table also gives my comments (where appropriate) on whether there is evidence from the information presented to me, that there is satisfactory compliance with these requirements and actions.

The main aspects of the Flood Mitigation Manual are the various strategies for operating Wivenhoe Dam and Somerset Dam as well as a number of requirements relating to flood operations personnel, flood preparedness and flood training.

At Wivenhoe Dam there are four main strategies for operating the dam (W1 to W4) and at Dam there are three (S1 to S3). These strategies are hierarchical and are based on a number of flood objectives. These in descending 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 (FSL) at the conclusion of the Flood Event, and;
- Minimise impacts to riparian flora and fauna during the drain down phase of the Flood Event.

Normal procedures require a return to FSL within 7 days of the flood event peak passing through the dams so that the potential effects of closely spaced Flood Events can be allowed for.

It is apparent from the Technical Situation Reports that emphasis has been given to communicating changes in flood operations strategies with local authorities and the Bureau of Meteorology (BOM).

Until the last day or so, Wivenhoe Dam has been below EL74.0 and accordingly, would be operating under Strategy W1 i.e. make releases such that bridges downstream of the dam do not have to be closed prematurely. For a few days at the end of December and for the last day or so before yesterday's big rise, Strategy W2 would be in place (restrain releases from Wivenhoe Dam such that Brisbane River flows are maintained within the upper limit of non-damaging floods at Lowood (3,500 m3/s)). At various times during the Flood Event some of the downstream bridges have been closed. However, it is evident that action has been taken to vary dam releases such that various bridges could be re-opened as soon as possible. This appears to have been done in accordance with the flood operating strategies. The operations then moved onto Strategy W4 when the storage in Wivenhoe Dam reached about EL 73.5 (before the W4 trigger level of EL 74) when yesterday's heavy rain came on and it was assessed that there was a chance that the first (central) fuse plug could be triggered. It was then a matter of juggling the radial gate openings in an attempt to circumvent any fuse plug triggering. A graph of storage levels for Wivenhoe and Somerset Dams (from information taken from the Technical Situation Reports) showing the limits for the various Wivenhoe Dam flood strategies is given in Attachment A. It is apparent from this graph, that the appropriate flood operation strategies were adopted. The Technical Situation Reports indicate that proposed changes in strategy were appropriately communicated with appropriate authorities in accordance with the new Communication Protocol.

Summary:

The Technical Situation Reports comply with the requirements of the new Communication Protocol. However, I feel that there could be more consistency in the information presented. There seem to be gaps in information presented such as storage levels (see spreadsheet and graph in Attachment A). It would be useful to specify the minimum information required to be presented in the Technical Situation Reports (storage levels, inflows, recent/current rainfall, forecast rainfall, releases from dams, estimated flows from downstream tributaries, current flood operating strategy for each dam and proposed change in strategy, gate and regulator operations, state of downstream road crossings etc). Most of the minimum information is already given, but not in a consistent manner. As a means of reviewing processes followed during a flood, it would be useful to present a timeline of the flood event showing graphs of storage levels and other data that can be easily presented in a graphical manner.

I am informed by the Queensland Director Dam Safety (Water Supply) that the various requirements of the Flood Mitigation Manual relating to requirements for flood operations personnel, flood preparedness and flood training have been adhered to. There are a number of other requirements however, that I am not able to say whether they were satisfied as I had insufficient information. These requirements (see Table in Attachment A) should be subject to a separate audit.

It appears to me that the decision to implement Strategy W4 was a prudent one. While it would cause some damage in the Brisbane River downstream, its implementation, considering forecast rainfalls and projected flows in Lockyer Ck. And the Bremer River, would allow reduction of the storage level in

Wivenhoe Dam. This reduction in storage level would hopefully provide a sufficient buffer that would minimise the chance of a fuse plug triggering in the auxiliary spillway. Triggering of the first (central) fuse plug would cause a sudden increase of flow of some 2,000m^3/s from Wivenhoe Dam. This increase in flow would cause significantly more flooding in the lower Brisbane River than that caused by early implementation of Strategy W4.

Conclusions:

The strategies as set out in the Flood Mitigation Manual have been followed, allowing for the discretion given to making variations in order to maximise flood mitigation effects. The actions taken and decisions made during the Flood Event appear to have been prudent and appropriate in the context of the available knowledge available to those responsible for flood operations and the way events unfolded.

There are a number of requirements where there was insufficient time given the urgency of this review, to source the necessary information for me to demonstrate compliance. However, satisfaction or otherwise of these requirements would have had little impact on the operation of the two dams during this particular Flood Event. It is intended that they be audited when time permits, after the Flood Event.

There are aspects of the Technical Situation Reports that could be improved and these have been discussed above.

Regards,

[redacted]

Brian Cooper

ATTACHMENT A

Action Requirements extracted from the Flood Mitigation Manual:

Action	Comment
The Flood Mitigation 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.	Appears to have been done
Sufficient numbers of suitably qualified personnel are available to operate the dams if a Flood Event occurs.	Director of Dam Safety is satisfied
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.	See Note 1
A regular process of internal audit and management review must be maintained by Seqwater to achieve improvements in the operation of the RTFM.	See Note 1
Seqwater must maintain a log of the performance of the data collection network. The log must include all revised field calibrations and changes to the number, type and locations of gauges. Senior Flood Operations and Flood Operations Engineers are to be notified of all significant changes to the Log.	See Note 1
Seqwater must maintain a log of the performance of the RTFM. Any faults to the computer hardware or software are to be noted and promptly and appropriately attend to.	See Note 1
Seqwater must ensure that all available data and other documentation is appropriately collected and catalogued for future use.	See Note 1
Seqwater must ensure that information relevant to the calibration of its field stations is shared with appropriate agencies.	See Note 1
Seqwater must liaise and consult with these agencies with a view to ensuring all information relative to the flood event is consistent and used in accordance with agreed responsibilities: • Bureau of Meteorology (issue of flood warnings for Brisbane River basin); • Department of Environment and Resource Management (review of flood and discretionary powers); • Somerset Regional Council (flood level information for upstream of Somerset Dam and upstream and downstream of Wivenhoe Dam); • Ipswich City Council (flood level information for Ipswich), and; • Brisbane City Council (flood level information for Brisbane City).	Required also by draft of Communications Protocol. Technical Situation Reports infer compliance
Seqwater must report to the Chief Executive by 30 September each year on the training and state of preparedness of operations personnel.	See Note 1
Seqwater must provide a report to the Chief Executive by 30 September each year on the state of the Flood Monitoring and Forecasting System and Communication Networks.	See Note 1

Action	Comment
After each significant flood event, Seqwater must report to the Chief Executive on the effectiveness of the operational procedures contained in this manual.	It is too early for this action to be implemented. Will be implemented when the Flood Event is finished
Prior to the expiry of the approval period, Seqwater must review the Manual pursuant to provisions of the Act.	It is too early for this action to be implemented
Strategies are changed in response to changing rainfall forecasts and stream flow conditions to maximise the flood mitigation benefits of the dams.	Technical Situation Reports indicate that this is done
When determining dam outflows within all strategies, peak outflow should generally not exceed peak inflow.	Information from Seqwater indicates that the requirement was satisfied
Protocol for use of discretionary powers (i.e. who gets told)	Director of Dam Safety is satisfied – I don't know whether Seqwater CEO or Chairperson approved – See Note 1

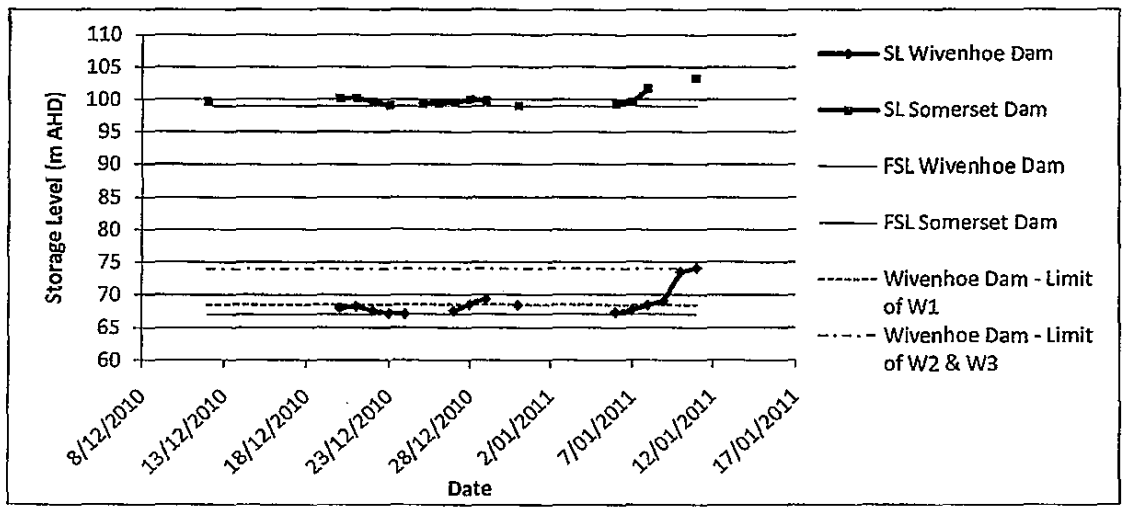
Note1: For a number of the above actions, given the short time frame for the review on compliance of actual flood operations with the Flood Mitigation Manual, it was not possible to source some of the information required to confirm that requirements had been fulfilled. These actions will be audited separately, when time permits.

Action	Comment
Flood Strategies for Wivenhoe Dam:	
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 m^3/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.	Technical Situation Reports indicate that every attempt was made to keep the specified road crossings open
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 m^3/s). In these instances, the combined peak river flows should not exceed those shown in the following table:	Technical Situation Reports indicate that Wivenhoe Dam releases were made considering concurrent flows in the Bremer River & Lockyer Ck. To delay damaging floods as long as possible
The intent of Strategy W3 is to limit the flow in the Brisbane River at Moggill to less than 4000 m^3/s, noting that 4000 m^3/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 m^3/s. In these instances, the flow at Moggill is to be kept as low as possible.	
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 EL74.0 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. There are no restrictions on gate opening increments or gate operating frequency once the storage level exceeds EL74.0 AHD, as the safety of the dam is of primary concern at these storage levels.	Technical Situation Reports indicate that Wivenhoe Dam releases were such as to delay adopting this strategy as long as possible
Where possible, total releases during closure should not produce greater flood levels downstream than occurred during the flood event.	Technical Situation Reports indicate that this requirement was satisfied
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.	Technical Situation Reports indicate that

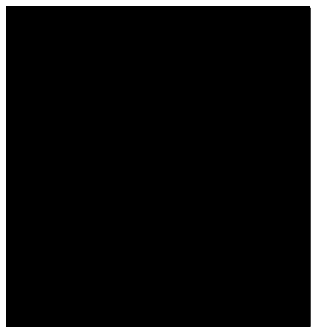
Action	Comment
	emphasis was given to satisfying this requirement
Flow in the spillway to be as symmetrical as possible with the centre gates opened first.	Technical Situation Reports indicate that this was done
The bottom edge of the radial gates must always be at least 500mm below the release flow surface.	See Note 1 above

Action	Comment
Flood Strategies for Somerset Dam:	
The intent of Strategy S1 (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) 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.	Technical Situation Reports indicate that this was done
The intent of Strategy S2 (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). This to maximise the benefits of the flood storage capabilities of the dam while protecting the structural safety of both dams. The Flood Mitigation Manual contains a graph that shows the intended interaction of the Wivenhoe Dam and Somerset Dam storage levels.	Technical Situation Reports indicate that this was done – little information on the operation of the radial gates at Somerset Dam. How the graph was followed not really demonstrated
The intent of Strategy S3 (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) is to maximise the benefits of the flood storage capabilities of the dam while protecting the structural safety of both dams.	Not relevant at this stage
The safety of Somerset Dam is the primary consideration and cannot be compromised and its peak level cannot exceed EL 109.7.	Maximum level only EL103.3

Wivenhoe & Somerset Dams – Storage Level Behaviour (as presented in Technical Situation Reports)



Date	Time	TSR	Wivenhoe Dam Release (m^3/s)				Gate No.	Opening (m)	Sto
			Regulators	Hydro	Gates	Total			
12/12/2010	1400	W1							
13/12/2010	1300	W2		10	290	300			
15/12/2010	1800	W3							
16/12/2010	1600	W4			0				
17/12/2010	1200	W5							
17/12/2010	1800	W6	Closed		Opening Op. Initiated				
	1830			13	50	63	3	0.5	
18/12/2010	0700	W7							
19/12/2010	0700	W8			350	350	3	3.5	
19/12/2010	1800	W9			300	300	3	3	
20/12/2010	0700	W10							
20/12/2010	0900	W11							88. aft
20/12/2010	0900	W12							pe cu
21/12/2010	0730	W13				peak 3,280 (0500)			[11 slo cu [10 slo to
22/12/2010	0830	W14							
22/12/2010	1800	W15			Closing sequence				Wh wil FSL op lev
23/12/2010	0800	W16			All gates expected to be closed by 1500				
23/12/2010	1430	W17			350		3	3.5	67.
24/12/2010	0630	W18			All gates expected to be closed by 1300				wh clo
24/12/2010	1330	W19	4,200Mł/d by from reg. & Hydro		Radial gate ops ceased @ 1300		3	zero	
25/12/2010	0930	W20							
26/12/2010	0800	W21							
27/12/2010	0800	W22							
28/12/2010	0700	W23			347 (initially) then back to 46				
29/12/2010	0700	W24							69. aim FSL 69. yes
30/12/2010	0700	W25			Wivenhoe+Lockyer = 1,600m^3/s				(2.3 thi
31/12/2010	0700	W26			Wivenhoe+Lockyer = 1,600m^3/s				68.
		W27							
06/01/2011	1200	W28			Commence opening RG @ 1200 & ramp up to 300m^3/s by 2200				67.
07/01/2011	0700	W29							67.
07/01/2011	1500	W30			Release started 1500 to be incr. slowly to ~1,200m^3/s by 1400 tomorrow				
08/01/2011	0700	W31			~890		All (5) RG's open		68. ste
09/01/2011	0700	W32				1,343			Cur (fal
		W33							
09/01/2011	2100	W34				1,420			Cur
		W35							
		W36							
		W37							
11/01/2011	0630	W38			2,750 since 1930 on 10/1/2011		All (5) gates		73. 25
11/01/2011	1200	W39				3,970			74. ris



Brian Cooper

Dams Engineer

Qualifications & Affiliations

Short courses on finite element analysis, embankment dam engineering, earthquake engineering. Published technical papers – ICOLD. ANCOLD and I.E. Aust. Attended dam safety course at USBR (Denver, USA) in 2002

Bachelor of Engineering (B.E. Hons), 1968 and Master of Engineering Science (M.Eng.Sc.), 1971

University of New South Wales

Graduate Diploma of Engineering Management, 1994 Deakin University

F.I.E. Aust.,C.P.Eng. RPEQ

Expertise

Brian has approximately 40 years experience in investigation and design of major dams, weirs and hydraulic structures, having started his career designing farm dams and small irrigation schemes. He retired from NSW Department of Commerce in 2005. Brian now works as a private consultant specialising in dams engineering and fish passage at dams and weirs. He has a special interest in risk assessment and computer modelling in general and the seismic analysis of dams in particular. Engineering software (concrete dam stability analysis and flood routing) written by Brian is still used extensively in the Dams & Civil Group of the Department of Commerce. He also has particular experience with concrete dams and the use of post tensioned ground anchors for strengthening those dams. He was a member of the Australian National Committee on Large Dams (ANCOLD) Working Group that developed guidelines for 'Design of Dams for Earthquakes' and a member of the Working Group that revised the guidelines for 'Risk Assessment for Dams'. He has been a guest lecturer for a number of years (most recently in 2009) on concrete dam engineering for the University of NSW post graduate Embankment Dam Engineering Course, and on the history of dams in NSW at Sydney University.

He has been the project director and project manager for a number of feasibility studies, design reviews, site investigations and detail design consultancies for major dams and weirs including the direction and co-ordination of all specialist services including dambreak studies, preparation of dam safety emergency plans and risk assessments. He is currently an expert reviewer for a number of Australian water authorities and consultants (State Water Corporation (NSW), Hydro Tasmania, SunWater (Queensland), Brisbane City Council, Goulburn-Murray Water, Goulburn Valley Water, WA Water Corporation, Southern Rural Water (Victoria), URS, GHD, Hobart Water, NT PowerWater, and TrustPower (NZ)). He has also worked as a sub-consultant for a number of consulting firms (URS, MWH, GHD).

Brian is the Engineers Australia representative for the NSW Dams Safety Committee (the dam safety regulator in NSW) and is currently the Chairman of that organisation. He has been a member of the Murray Darling Basin Authority's Fish Passage Task Force which advises inter alia on the installation of fishways on the Murray River as part of the Living Murray Program.

Brian is a registered engineer in Queensland (RPEQ No. 6819). He started his own consulting business in 2008, advising on dam safety, dam design and analysis, dam risk assessments and dam upgrades as well as fish passage for dams. He is providing specialist advice through *Brian Cooper Consulting* as a sole trader.

resumé

Professional Experience

2008 to Present: Principal of Brian Cooper Consulting

2010

Five yearly comprehensive dam safety inspection of Carcoar Dam (double curvature arch dam).
Internal reviewer to URS (Melbourne) on concept design of regulator structures and associated fishways for the Hipwell Road project for watering the Gunbower Forest
Specialist adviser to Melbourne Water – valve behaviour on Sugarloaf Dam pipeline, structural behaviour of pumping station floor slab and pump bases at Cardinia Dam Pumping Station
Commenced work as member of ANCOLD working group re-writing the Earthquake Guidelines – responsible for re-writing sections relating to concrete dams.
Continuing involvement with Alluvium in the design of the weir upgrade and the new fishway for Booligal Weir.
Continuing external peer review services to State Water Corporation for the detail design of new auxiliary fuse plug spillways for Copeton and Chaffey Dams, detail design of raising and post tensioned strengthening of Keepit Dam, detail design of upgrade works for Wyangala Dam, finite element analysis of Carcoar Dam (double curvature arch dam).
Further work with GHD (Perth) on risk assessment for Serpentine Dam.
Continuing involvement with Hydro Tasmania, as Chair of external review panel for Catagunya Dam.

2009

Part of URS' comprehensive inspection team for Melbourne Water's Maroondah Dam.
Part of URS' business risk assessment team for Southern Rural Water's Cowwarr and Maffra Weirs.
Part of Alluvium's design team upgrading Booligal Weir and providing a fishway at the weir, for State Water Corporation.
Part of GHD's design team for Lower Fitzroy River Infrastructure Project designing fishways for Rookwood and Eden Bann Weirs near Rockhampton in Queensland.
Project Manager on behalf of SA Water and reviewer for study into vibration of a crane rail beam at Lock 5 on the River Murray.
Expert reviewer for State Water Corporation for 3D finite element analysis of Carcoar Dam (double curvature arch dam).
Internal reviewer for URS on Laanecoorie Dam Upgrade.
Expert reviewer for State Water Corporation for risk assessments for Oberon and Rydal Dams.
Member of GHD's Serpentine Dam risk assessment team for WA WaterCorp.
Expert reviewer for SunWater in Queensland for the comprehensive risk assessment undertaken for Fairbairn Dam and Coolmunda Dam.
Expert reviewer for State Water Corporation for major upgrade works at Keepit, Copeton, Chaffey and Wyangala Dams.
Appointed as Chairman of the NSW Dams Safety Committee (the dam safety regulator in NSW).
Provided external peer review for Goulburn Valley Water, on Nine Mile Creek Dam Upgrade.
Internal reviewer for URS (Adelaide) for Lake Victoria Outlet Regulator options studies.
Provided advice to URS (Melbourne) on the Mildura Weir Fishway design.
Member of expert panel advising State Water Corporation on revised dam surveillance regime.
Part of Ecosmart bid team - prepared concept designs for fish passage facility at proposed Wyaralong Dam in Queensland.
Continuing expert review role for Catagunya Dam upgrade.

2008

Started as a private specialist dams consultant - *Brian Cooper Consulting.*
Worked through the URS Corporation for the USBR and the USACE in developing a risk toolbox for lined spillways.
Advised TrustPower in New Zealand on replacement of post tensioned anchors at Mahinerangi No. 1 Dam.
Adviser to State Water Corporation and to URS on further upgrade works for Hume Dam.
Provided specialist advice to WA Water Corporation on Wellington Dam post tensioning.
Peer reviewer on behalf of URS for Warren Dam in South Australia.
Part of URS team carrying out portfolio risk assessment of Melbourne Water's dams.
Member of Expert Review Panel for Darwin River and Manton Dams for NT PowerWater.

1987 to 2008: Dams & Civil Section of NSW Department of Public Works and Services/NSW Department of Commerce.

2008	Carried out detailed 3D finite element analysis of radial gate at Wyangala Dam spillway for State Water Corporation. Continuing review role for Tillegra Dam. Continuing review role for Hinze and Lake Manchester Dams in Queensland and Catagunya Dam in Tasmania. Prepared options report on Burrendong Dam spillway modifications for State Water Corporation.
2007	Continuing roles on Lake Manchester, Hinze, Catagunya and Redbank Ck. Dams. Internal peer reviewer for NSW Dept. of Commerce regarding design of Tillegra Dam. Advised State Water on feasibility of fish passage facilities at a number of their major irrigation dams. Expert reviewer for GHD on a flood retarding basin in south west Sydney. Part of expert panel for River Murray Water risk assessments for Hume and Dartmouth Dams, Torrumbarry and Yarrowonga Weirs and Lake Victoria. Re-elected as Deputy Chairman of the Dams Safety Committee
2006	Project director for 3D finite element analysis of Bendora Dam (double curvature arch dam) Chair of external peer review panel for upgrading of Lake Manchester Dam (concrete gravity dam) in Queensland Internal peer reviewer and senior consultant for the raising of Hinze Dam (earth and rockfill embankment) in Queensland Project director for preliminary and detailed design of Redbank Creek Dam (single curvature arch dam) upgrading Project director for Keepit Dam fish passage investigations Part of expert panel for URS undertaking portfolio risk assessment for dams owned by River Murray Water External peer reviewer for Hydro Tasmania for Catagunya Dam (concrete gravity dam) upgrading; Project director for 3D finite element analysis of Upper Cordeaux No. 2 Dam (single curvature arch dam owned by SCA) for BHP Billiton
2005	Project design engineer for dam related aspects of Nepean Dam Deepwater Access Project: Pipeline crossing end of spillway; outlet works for end of pipeline Project design engineer for Avon Dam Deepwater Access Project: tunnel design through rockfill buttressing; new low level outlet works
2004	Internal reviewer to URS Australia for Pykes Ck Dam Investigations (Southern Rural Water, Victoria) Internal reviewer to URS Australia for Lower Reservoir Dam (Hobart Water, Tasmania) Member of expert review panel for the Melton Dam upgrade design (Southern Rural Water, Victoria)
2003/04	Designer for retrofitting multi-level offtake for Tallowa Dam (Sydney Catchment Authority). Member of the Independent Technical Expert Panel for the Eildon Dam Upgrading in Victoria for Goulburn-Murray Water. Currently the design director for the Wivenhoe Dam Alliance carrying out the flood capacity upgrading for Wivenhoe Dam in Queensland – included directing major computational fluid dynamics modelling investigations of existing spillway
2003	Carried out options study for environmental upgrading works at Keepit Dam (selective withdrawal facility, additional outlet works and fish passage) Carried out assessment of spillway capacity for Hume Dam using computational fluid dynamics modelling (by a sub-consultant) Carried out detail design for anchoring Bellfield Dam (Victoria) Intake Tower Carried out detailed finite element analysis of Keepit Dam radial gates
2002	Carried out review of large farm dam with seepage problems. Directed computational fluid dynamics modelling of drum gate and radial gates at Warragamba Dam together with structural analysis of gates (modelling carried out by sub-consultant) to ensure gates can handle more

rigorous operating conditions
Adviser to the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) on civil engineering matters related to the replacement reactor project at Lucas Heights
Expert reviewer for Goulburn-Murray Water for remedial works at Cairn Curran Dam in Victoria
Project Director for Lerderderg Weir safety review and risk assessment for Southern Rural Water (Victoria). Carried out finite element analysis of radial gate

2001

Project Director for design of further remedial works at Hume Dam.
Technical director on behalf of NPWS for quantitative risk assessment for Snowy Mountains roads
Chairman of the committee producing a geotechnical response plan for the Alpine Way in the Snowy Region for NPWS
Carried out non-linear finite element analysis (earthquake loading) for outlet tower at Bellfield Dam for Wimmera-Mallee Water (Victoria)
Joined the MDBC's Fish Passage Reference Group and reviewed fishway designs
Consultant to DLWC for their portfolio risk assessment of thirty dams
Provided advice on the post tensioning system at Waitakere Dam in New Zealand.

Director of Dam Surveillance Group responsible for the surveillance of DLWC dams and participant of a number of 5 yearly surveillance inspections
Project Director of review of DLWC Intake Towers Earthquake Stability Review
Directed DPWS input into the Earthquake Stability of the structural elements of Yarrawonga Weir as sub-consultant to URS Australia – included detail design of anchoring system for the weir. Also provided design advice on design of stone columns to provide protection against liquefaction of alluvial foundations.
Member of the expert panel for the risk assessment studies being undertaken for Goulburn-Murray Water
Project Director for safety review and preliminary design of remedial options for Blowering Dam (DLWC)
Acted as reviewer for a number of projects carried out by URS (incl. Cardinia Dam outlet tower, Bellfield Dam embankment/spillway)
Directed functionality study (including business risk assessment) for Yallourn Weir for Southern Rural Water (Victoria)

2000

Project Director for design of further investigations and remedial works at Hume Dam.
Safety reviews for Bamarang and Flat Rock Dams
Director of Dam Surveillance Group responsible for the surveillance of DLWC dams and participant of a number of 5 yearly surveillance inspections
Project Director for earthquake studies on intake towers and appurtenant works at DLWC dams
Consultant to DLWC to manage their portfolio risk assessment
Project Director for a number of dambreak studies and preparation of dam safety emergency plans
Member of the consulting team carrying out risk assessments for Goulburn-Murray Water (Victoria) for Eppalock Dam
Carried out review of Earthquake Stability Review of the Outlet Tower at Eppalock Dam in Victoria for G-MW.
Reviewed URS Australia designs for Alpine Way remedial works

1999

Project Director of earthquake studies on Wyangala Dam
Project Director for design of further remedial works at Hume Dam. Included design of ground improvement works (stone columns) for protecting alluvial foundations against liquefaction
Peer reviewer of Leslie Dam (Queensland) Safety Report.
Peer reviewer of DLWC's Screening Level Risk Assessment

1998

Project Director for portfolio risk assessment for six dams owned by a Southern Rural Water in Victoria.
Directed structural analysis of spillway gates on Narracan Dam for Southern Rural Water
Project Director for concept design and DD&C contract documentation for Warragamba Dam auxiliary spillway. Dam to be upgraded the dam to cater for increased inflow flood estimates. Upgrading works estimated to cost $135M. An auxiliary spillway is to be constructed adjacent to the existing dam - involves excavating some 2,000,000m³ of rock and constructing concrete lining, training walls, fuse plug embankments, large scale cement stabilised sandstone fill, a multi

span bridge across the spillway, post tensioned ground anchors for dissipator/training walls, modifications of existing spillway gates. Design involved extensive physical hydraulic model testing.

1997 Feasibility options study for remediation of Redbank Ck. Dam near Mudgee (NSW) Karapiro Dam, New Zealand - Part of international consulting team reviewing this concrete arch dam's security and determining appropriate remedial options (mass concrete buttressing). Director of risk assessment studies for Tenterfield Dam

1993-1997 Hume Dam Investigations - Project Manager of Investigation and Design Studies for the embankments at the dam. Work involves:

- review of the stability of the embankments under static and earthquake loadings
- investigation of liquefaction
- potential of embankments' foundations
- development of stabilising options
- development of options to provide increased flood security including provision of new auxiliary spillways and modifications to existing works

- detail design and documentation of stabilising works for the embankments including a key trench into the dam's foundations, stabilising berms, slurry wall cut-offs, drainage/filter curtains and strengthening of critical gravity training walls with both horizontal and vertical post tensioning.

- part of advisory and review team for the risk assessment of the dam and its components.

1990-1996 Warragamba Dam Upgrading for Sydney Water Corporation - Project Manager of Investigation Concept Design Studies for upgrading the dam to cater for increased inflow flood estimates and provide substantial flood mitigation. Upgrading works estimated to cost $280M. The existing dam was to be strengthened with mass concrete buttressing – some 600,000m³.

1996 Project Director for Safety Review (including Finite Element Analysis) of Wellington Dam

1993-1996 Hume Dam Gates for Department of Water Resources - Project Manager for the design of new maintenance baulks and emergency closure gates. Involves development of proposals for underwater installation.

1995 Redbank Creek Dam and Lithgow No. 2 Dam for NSW Public Works Dams Surveillance - Project Manager for safety reviews and finite element analysis of two 15m high arch dams. Clarrie Hall Dam for NSW Public Works Dams Surveillance - Project Manager for dambreak studies.

1994 Burrinjuck Dam Gates for NSW Department of Water Resources - Project Manager for the design of new control and emergency closure gates. Involves underwater installation. Karangi Dam for Coffs Harbour City Water Project - Project Manager for dambreak studies.

1993 Mardi Dam for Wyong Council - Project Manager for safety review of earth embankment.

1988-1990 Nepean Dam Remedial Works for Sydney Water Corporation - Project Manager for investigation studies, design development and detail design. Work involved:

- initial flood security studies and development of options
- co-ordination of hydraulic model studies
- detail design and contract documentation for modified spillway, large size post-tensioned ground anchors and rockfill buttressing.

1987-1989 Boggabilla Weir for NSW Department of Water Resources - Project Manager for detail design and contract documentation of a large gated re-regulation weir with fishway. Involved liaison with fisheries expert in developing optimum geometry for fish ladder.

Chaffey Dam for NSW Department of Water Resources - Project Manager for upgrading of dam. Work involved:

- development of options and preliminary design
- finite element analyses for raised morning glory spillway
- stability analyses for raised earth/rockfill embankment
- co-ordination of hydraulic model studies for raised spillway.

1969-1987: ***Water Resources Commission of NSW (WRC) (now Department of Land and Water Conservation).***

1986-1987 Flood Security studies for WRC - Project Design Engineer for investigation into flood security of Chaffey and Glennies Creek Dams. Involved co-ordinating dambreak studies, development of remedial options, economic risk studies.

1985-1987 Hume Dam Strengthening for WRC - Project Design Engineer for detail design and contract documentation. Work included:

- design of large size post-tensioned ground anchors including development of appropriate grouting procedures
- design of structural modifications to the concrete gravity dam
- design of a new road bridge over the dam.
- establishing the rationale for replacing the existing post tensioning system

Contact

Tel: [redacted]
Mobile: [redacted]

resumé [redacted]

SEQ Water Grid

Talking Points

TRIM reference: D/11/	Enquiry received:
Purpose: Wivenhoe Dam release	

Impacts of Wivenhoe and Somerset dams

- Wivenhoe and Somerset dams reduced the flood peak by 2.5 metres in the City and 5.5 metres at Moggill.
- Without the dams, up to 13,000 more houses would have been flooded. They prevented up to $1.6 billion of damages.
- Without the dams, major flooding would have lasted for three days.
- Wivenhoe and Somerset dams controlled 2.6 million megalitres of floodwater. This is 1.1 million megalitres more than in 1974.
- The dams controlled these floodwaters, providing time for peak flows from the Lockyer and Bremer to pass.
- Total flow in the Brisbane River in 1974 was 9,500 cubic metres per second. The estimated flow from this event would have been 13,000 cubic metres per second if Wivenhoe did not exist.

Operation of Wivenhoe and Somerset dams

- The dams were operated strictly in accordance with the approved Operational Procedures.
- The Operational Procedures were developed by Australia's best hydrologists, including:
    - Professor Colin Apelt, Head of Department, Department of Civil Engineering, University of Queensland
    - Mr Eric Lesleighter, Principal Hydraulic Engineer and Chief Engineer Water Resources, Snowy Mountains Engineering Corporation.
- Professor Apelt is Chair of the Brisbane City Council flood taskforce.

Flood report

- There is a regulatory requirement that Seqwater prepare a flood report.
- By regulation. the report will be submitted within six weeks of the gates closing.

- The report will be a comprehensive summary of all procedures, actions, outcomes and processes during the event. It will consider factors impacting on the protection of urban areas.
- The report will be reviewed by the Dam Safety Regulator and independent experts.
- The report and its review will be submitted to the Government and inform a review of the Operational Procedures.
- The review of Operational Procedures will utilise an expert panel, including representatives of the Bureau of Meteorology and Councils.

Rainfall forecasts

- Dam operations were based on forecasts provided by the Bureau of Meteorology.
- The rainfall during the event exceeded all forecasts.
- Rainfall was local and intense, as demonstrated by the tragic events in Toowoomba.

CTS No. 00741/11

Water Grid Manager and Seqwater
MINISTERIAL BRIEFING NOTE

[redacted]
Adviso ☐ OK
Dated 31/1/11
☐ Approved ☐ Not Approved ☐ Noted
☐ Further information required
Minister [redacted]
Dated 1/2/11

TO: **Minister for Natural Resources, Mines and Energy and Minister for Trade**

SUBJECT: **Tugun Desalination Plant Operations**

RECEIVED
MINISTERIAL OFFICE
27 JAN 2011

☐ MINISTER
☐ POL ADV
☐ MEDIA ADV
☐ PARL SEC
☐ ADMIN
☐

TIMEFRAME

- Noting of this brief is non urgent.

RECOMMENDATION

It is recommended that the Minister **note**:

- that increased raw water turbidity is expected to constrain production from the Mt Crosby Water Treatment Plants for at least four weeks.
- that the Tugun Desalination Plant will be required to continue to produce at between one third and two thirds of capacity.
- the Tugun Desalination Plant standby trials will commence once Mt Crosby Water Treatment Plants resume normal production amounts for an extended period of time.

BACKGROUND

- The Tugun Desalination Plant started standby trials in December 2010, with the trials scheduled to continue throughout January 2011. These trials included a process by which the Tugun Desalination Plant would operate at one third capacity for one day, then shut down for up to three days, before re-commencing production for another day. This cycle would be repeated for up to two weeks at a time.
- Mount Crosby Water Treatment Plants (East and West Bank) typically supply approximately 500,000 persons within the Brisbane and Ipswich region.

CURRENT ISSUES

Raw water

- Due to heavy rainfall during the recent flood event, there are very high levels of sediment suspended in Wivenhoe Dam's drinking water storage compartment. These dam conditions are unprecedented. Water quality is worse than what is flowing from the Lockyer Valley.
- From next week, roughly 1,000 tonnes per day of sediment is expected to flow past Mt Crosby Weir every day.
- As a result of the high sediment levels in the Brisbane River, poor raw water quality is evident.

Mt Crosby Water Treatment Plants

- The Mount Crosby Water Treatment Plants are effectively removing these high levels of sediment and the highly discoloured appearance of the river water.
- The poor raw water quality has resulted in a reduced production capacity at Mount Crosby Water Treatment Plant (MCWTP).
- Also as a result of high sediment levels, the Mount Crosby treatment process is currently generating significant quantities of water treatment residues which need to be thickened and disposed of.

Rec'd - ODG 21 JAN 2011

Author	Cleared by	Cleared by	Recommended:
Name: Jade Simmons Position: Sr Correspondence Officer Tel No: [redacted] Date: 20 January 2011	Name: Dan Spiller Position: Director, Operations Tel No: [redacted]	Name: Barry Dennien Position: CEO, SEQWGM Tel No: [redacted] noted 22/1/11	Name: John Bradley Director-General, DERM Tel No: [redacted] Date: [redacted]

Rec-ODDG 21 JAN 2011

File Ref: [redacted] 1/11

- MCWTP has the capacity to thicken and dispose of a normal quantity of residue and has emergency storage for residues. However, if current levels of residue productions persist, these storage areas will be filled in four to eight weeks.
- The Department of Environment and Resource Management (DERM) has approved an initial release of excess water treatment residues from Mt Crosby Eastbank Water Treatment Plant to the Brisbane River. This release amounts to less than two per cent of sediment currently flowing in river.
- Additional water treatment residue capacity is being investigated as a priority.

Water balance

- In order to supply water to central South East Queensland, several actions have been undertaken, including increasing supply from the Tugun Desalination Plant to two thirds capacity.
- Further actions to mitigate the reduced supply from Mt Crosby Water Treatment Plants include maximising transfers through the Southern Regional Water Pipeline, increasing production of Molendinar Water Treatment Plant to capacity, maximising North Pine Water Treatment Plant production and transfers through Northern Pipeline Interconnector.

RESOURCE/IMPLEMENTATION IMPLICATIONS

- Savings in 2010-2011 were not factored in to the recently announced changes to the bulk water price path. However, there were reduced savings in 2010-2011.
- Increased operation of the Tugun Desalination Plant over December and January has cost approximately $1.2 million.

PROPOSED ACTION

- The Tugun Desalination Plant will continue increased production levels until the Mt Crosby Water Treatment Plants resume normal production amounts for an extended period of time.
- While Tugun Desalination Plant continues increased production, the standby trials will be postponed.

OTHER INFORMATION

- *Consultation: Continued consultation has been undertaken with Seqwater, LinkWater and WaterSecure to ensure all aspects of the South East Queensland Water Grid are working together. DERM has been consulted on the possibility of disposing larger amounts of residue into the Brisbane River.*
- *Key Communication Messages: A draft media release has been formulated regarding the Tugun Desalination Plant's support for supplying water to Brisbane and Ipswich regions is at* ***Attachment A.***

MINISTER'S COMMENTS

ATTACHMENTS

Attachment A: Draft media release – Climate resilient assets keep water supply flowing

Author	Cleared by	Cleared by	Recommended:
Name: Jade Simmons Position: Sr Correspondence Officer Tel No: [redacted] Date: 20 January 2011	Name: Dan Spiller Position: Director, Operations Tel No: [redacted]	Name: Barry Dennien Position: CEO, SEQWGM Tel No: [redacted]	Name: John Bradley Director-General, DERM Tel No: [redacted] Date:

File Ref:

SEQ Water Grid

Media Release

Climate resilient assets keep water supply flowing

The Tugun Desalination Plant continues to make an important contribution to the water supply for Brisbane.

Switched up to full power at the height of the flood emergency, the facility has since been operating at two thirds capacity, bolstering the supply outputs from Brisbane's flood impacted water treatment plants.

Water Grid spokesperson Barry Dennien said the desalination plant is playing an integral role in maintaining water quality across South East Queensland.

"Although we have all of our water treatment plants operating, the high sediment levels in the Brisbane River mean that production is reduced.

"To highlight this, there are currently up to 1,000 tonnes of dirt flowing over the Mt Crosby Weir per day.

"This is where the desalination plant becomes a vital component of the emergency response for South East Queensland.

"We are able to utilise this asset, which can guarantee as much as 3,000 litres of impeccable water per second, when others struggle," said Mr Dennien.

The Water Grid's Western Corridor Recycled Water Scheme has also been switched on to the emergency response.

It has been providing purified recycled water for the critical wash down and clean up phase, freeing up potable water in those areas hardest hit by the floods.

Last year, the State Government announced plans to place the Tugun Desalination Plant into standby mode and to de-mobilise parts of the Western Corridor Recycled Water Scheme.

These actions allowed for these plants to be able to swing into an emergency response while at the same time enabling the Water Grid to take full advantage of the wet season.

"These climate resilient assets have performed perfectly for our emergency response and have allowed us enormous flexibility in handling the flood crisis, stated Mr Dennien.

Water supplies for Ipswich, Brisbane, Gold Coast and Sunshine Coast are currently safe and secure, despite the severe flooding.

SEQ Water Grid

Media Release

The plant will now move to standby mode in February or March, when Mt Crosby Water Treatment Plant returns to normal production.

This will have no impact on the reductions to bulk water prices that were announced in December 2010.

For more details on the desalination plant go to www.watergrid.com.au

ENDS

About the SEQ Water Grid: Established in June 2008, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure and is a world class asset in water management in both times of drought and deluge.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the Water Grid Communications Unit on:

Ph: [redacted] **| Mobile:** [redacted] **| Email:** [redacted]

CTS No. 01190/10

Advisor .....OK Dated / /
Approved/Not Approved/Noted **Further information required** Minister ..... Dated / /

SEQ Water Grid Manager
MINISTERIAL BRIEFING NOTE

TO: **Minister Robertson**

FROM: **Barry Dennien, Chief Executive Officer**
SEQ Water Grid Manager

SUBJECT: **Water Grid operational status**

Noted / **Further information required** DG DERM ..... Dated / /

TIMEFRAME

- This briefing note is intended to provide more detail regarding Water Grid operations, prior to the Cabinet meeting on 31 January 2011.

RECOMMENDATION

It is recommended that the Minister:

- **note** that supply has been restored to the few areas in South East Queensland (SEQ) that lost supply;
- **note** the ongoing and emerging issues impacting on the operation of the Water Grid will continue for some months; and
- **note** the exceptional efforts from staff from all Water Grid entities resulted in the majority of water supplies being available throughout the event, with few exceptions.

BACKGROUND

- Recent significant rainfall events and flood events across South East Queensland (SEQ) have impacted the operation and performance of many of the components of the Water Grid.
- On 26 January 2011, the flood related emergency was de-escalated to a Level 3 emergency. This decision followed the boiled water notices for the Lockyer and Somerset areas being lifted and a quality water supply being maintained across the Water Grid. The Level 3 Emergency will be maintained until the Lowood Water Treatment Plant dry well raw water pump has been repaired and is operating satisfactorily (refer below). Lowood was the only township where the water supply was not able to be brought back on line within the 48 hours following the flood event.
- While this emergency has been de-escalated, there remain a range of ongoing operational issues and constraints. These issues are expected to persist for some weeks to come and will be managed as part of the normal operation of the Water Grid. Key issues and responses are outlined below for information.
- These flood related issues and constraints are in addition to normal operational considerations, including management of water quality incidents and the risk of algal blooms in key storages.
- These issues will continue to be monitored and assessed, contributing to the work load of key staff in bulk water supply entities.

CURRENT ISSUES

Water treatment residue management

- Sediment and organic content in raw water has increased significantly, particularly in the Brisbane River. Raw water is also highly coloured.
- Early indications are that these conditions are likely to persist for several months, with the dams potentially taking up to a year to return to normal conditions.
- Due to poor raw water quality, chemical dosing requirements have increased along with the

quantities of water treatment residues which need to be thickened and disposed.

- The greatest impacts are at the Mt Crosby and North Pine water treatment plants. At Mt Crosby, about 10 times more water treatment residue is being produced than is normal.
- Both plants have emergency storage for residues to allow later processing after a rainfall event. However, at current levels of residue production and if river sediment and colour levels persist, all emergency storage will be filled in six to 12 weeks.
- Due to these issues, the Water Grid is being operated to reduce production requirements from the Mt Crosby and North Pine water treatment plants – with increased volumes being transferred into central SEQ from the Gold Coast and Sunshine Coast water treatment plants.
- The desalination facility continues to operate at two-thirds of capacity. This production together with increased production from Molendinar Water Treatment Plant allows about 90 to 95 megalitres per day to be transferred to central SEQ, while also meeting slightly increased demands on the Gold Coast.
- It is envisaged that this mode of operation will continue into February.
- In addition:
    - approval was received to release increased volumes of treatment residue material to the Brisbane River as a temporary measure to increase the time over which the emergency storage capacity will last; and
    - Seqwater is hiring mobile dewatering equipment and investigating other options to increase sludge handling capacity at the Mt Crosby and North Pines water treatment plants.

Other water treatment plants

- The Lowood Water Treatment Plant supplies the entire Lockyer Valley. The raw water pumping station was extensively damaged during the flood.
- The dry well has now been recommissioned, with pump repairs in progress. Repairs to the wet well cannot commence until the river levels drop. A diesel raw water pump is being used while repairs are in progress.
- A number of other water treatment plants in the Somerset and Lockyer Valley areas were damaged during the flood, including at Jimna, Kilcoy and Somerset. In most cases, electrical components were damaged.
- While the electrical and control systems are restored, Seqwater is operating the plants in manual mode with staff manning the plants daily.
- The Caboolture,Woodford and South Maclean water treatment plants remain offline due to high levels of turbidity in the raw water sources. The cessation of supply from these plants during high turbidity events is part of normal operating practice. Communities serviced by all three water treatment plants can also be supplied by the Grid as an alternative.
- Leslie Harrison Dam, due to wet weather, has turned over several times, causing dissolved organics in the water. This water quality is proving difficult to treat, however supply is being maintained and further supply options assessed.

Bulk transport

- The Bundamba offtake from the Southern Regional Water Pipeline was submerged and is not currently operational. LinkWater is undertaking an assessment of the damage sustained and the repairs necessary. It is a minor issue as supply to Ipswich is being maintained via Mt Crosby Water Treatment Plant, which is the major supply route for water to the Ipswich area.
- The Bundamba pumping station that assists the supply of the Southern Regional Water Pipeline when operating in its southerly flow mode has also been extensively damaged. Repairs have begun at the site to restore communications, however further repairs are required before the pump station can be ready for a return to service.
- Assessments are currently being undertaken to inspect and assess the operation of infrastructure in areas that were inundated. This includes inspection of creek crossings for physical damage and of valve pits to determine the risk of ingress of pooled water via air valves.

Western Corridor Recycled Water Scheme

- The flood has affected multiple sites across the Western Corridor Recycled Water Scheme.
- The Bundamba Advanced Water Treatment Plant will be unable to operate at capacity for at least three months, due to damage to the wastewater treatment plants that provide feedwater to the plant. Queensland Urban Utilities has provided formal advice that it is unable to supply from the Oxley, Wacol, Bundamba and Goodna wastewater treatment plants on account of flood damage.
- Supply is also contingent upon the condition of connecting pipelines, which have potentially been affected by landslips in the Goodna area. Detailed geotechnical assessments are underway.
- In the meantime, a temporary cross-connection has been installed to enable supply to the Swanbank power station from the Gibson Island and Luggage Point advanced water treatment plants. Supply has re-commenced.
- Supply to the Tarong power station is not possible at this time, due to damage to pumps owned by Tarong Energy Corporation (TEC). TEC is currently investigating the extent of damage and timeframe for recommencement of supply.
- In addition, there is electrical and potentially physical damage to components at a wide range of sites. This damage is currently being assessed.

Other damage assessment

- Seqwater is assessing the condition of assets such as dams and weir for damage from flood waters.
- Damage to the gauging network is also being assessed, and a rectification plan developed. This assessment is a high priority, due to the possibility of another major flood event over the remainder of the wet season. A coordinated strategy is required, as gauging stations are also owned by the Department of Environment and Resource Management and Councils.

RESOURCE/IMPLEMENTATION IMPLICATIONS

- Budget implications for the current financial year are currently being assessed.

MINISTER'S COMMENTS

CTS No. 01326/11

SEQ Water Grid Manager
MINISTERIAL BRIEFING NOTE

TO: **Minister Robertson**

FROM: **Barry Dennien, CEO, SEQ Water Grid Manager**

SUBJECT: **Ministerial visit to Mt Crosby Water Treatment Plant – East Bank pumping station**

Advisor .....OK Dated / /
Approved/Not Approved/Noted **Further information required** Minister ..... Dated / /

Noted / **Further information required** DG DERM ..... Dated / /

TIMEFRAME

- Approval/Noting of this briefing note is required prior to the Ministers visit to Mt Crosby Water Treatment Plant – Eastbank pumping station, on Tuesday 1 January 2011, to be held at 9.00 am.

RECOMMENDATION

It is recommended that the Minister:

- **note** the information provided in this brief, prior to the Ministers visit to Mt Crosby Water Treatment Plant – Eastbank pumping station, on Tuesday 1 January 2011.

BACKGROUND

- It is the SEQ Water Grid Managers' understanding that the Minister first requested to visit Mt Crosby Water Treatment Plant shortly after the recent flood event.
- The Mt Crosby Water Treatment Plants Eastbank and Westbank, supply approximately 500,000 persons in the Ipswich and Brisbane areas.

CURRENT ISSUES

- During the recent flooding event, both the Eastbank and Westbank's of Mt Crosby Water Treatment Plants were isolated by flood waters.
- Flood damage to the plants included the Westbank intake structure and Eastbank pump station. Repair crews were transported to and from the plant to undertake repairs. These staff worked under very difficult conditions (limited light, high humidity, mud and oily conditions) to bring pumps into operation.
- Due to the isolation, there were no chemical deliveries for several days and plant operations relied on held stock and limit production.
- Staff were isolated on-site during the event, working long hours under challenging conditions.
- Seqwater initially had staff isolated at both plants (including two chemical deliver drivers) and relied on helicopters to drop operators in and out.
- Communications during the event were compromised with no landlines, computer access and limited mobile access.
- Had the river level been higher during the peak, Energex and Seqwater made preparations to cut the power supply to the pump stations.
- As a result of high sediment levels, the Mount Crosby treatment process is currently generating significant quantities of water treatment residues which need to be thickened and disposed of.
- The Mount Crosby Water Treatment Plant has the capacity to thicken and dispose of a normal quantity of residue and has emergency storage for residues. However, if current levels of residue productions persist, these storage areas will be filled in six to12 weeks.

Contact: Barry Dennien, CEO, SEQ Water Grid Manager
Telephone: [redacted] Mobile: [redacted]
File Number:

Date: 31/01/2011

- The department of Environment and Resource Management has approved an initial release for excess water treatment residues from Mt Crosby Eastbank Water Treatment Plant to the Brisbane River. This sediment amounts to less than 2 per cent of sediment currently flowing in the river.
- Additional water treatment residue capacity is being investigated as a priority.

RESOURCE/IMPLEMENTATION IMPLICATIONS

- There are no resource/implementation implications

MINISTER'S COMMENTS

ATTACHMENTS

- List all attachments referred to in Brief

Department of Environment and Resource Management – Parliamentary Briefing Note

To Minister Robertson

Prepared for Parliamentary sittings 15-17 February 2011

WIVENHOE 25 per cent REDUCTION

KEY POINTS

- Seqwater has recommended to the Government that the water level in Wivenhoe Dam be temporarily reduced to 75 per cent of full supply.
- The recommendation was based on Seqwater modelling which involved 90 permutations of 9 different flood events.
- The modelling has been peer reviewed by external experts.
- The recommendation follows advice from the Water Grid Manager that such a reduction would not impact on the drinking water security of the region and acknowledges the region remains in the middle of the wet season.
- Dam inflows from the January event were almost double that of the 1974 flood and have established another flood benchmark
- This water release will not impact tides and therefore will not affect Brisbane city and suburbs. It is an interim measure for the remainder of the summer.
- It is also expected that the water released will be recouped in the coming years.

Contact: Mike Foster
Telephone: [redacted]
Date: 17 February 2011

CTS No. 02066/11

Approved: [Insert title of Dir/ED/GM/RSD]
Approved: Debbie Best, DDG WEO
Approved: Director-General

RESPONSE

- Seqwater has recommended to the Government that the water level in Wivenhoe Dam be temporarily reduced to 75 per cent of full supply.
- The recommendation was not made lightly. It is a recommendation which balances drinking water security and flood mitigation.
- The recommendation follows Seqwater modelling and is a precaution given the second strongest La Nina pattern in history and its influence on the current wet season.
- Seqwater had advised that a reduction in Wivenhoe Dam's storage level to 75 per cent of Full Supply provides appreciable flood mitigation benefits ahead of any major rain events that may occur during the remainder of the current wet season.
- The inflow into Wivenhoe Dam from this January flood event was almost double that of the 1974 flood. Water was flowing into the Dam 50 per cent faster than it was in 1974.
- That data has now been considered in Seqwater's modelling. This modelling has been peer reviewed by external experts, and involved 90 permutations of 9 different flood events.
- The SEQ Water Grid Manager has advised that there would be no objection from a water security perspective to the temporary reduction. ~~e, reducing Wivenhoe to 75 per cent would be manageable, with the recently completed Wyaralong Dam now~~

Contact: Mike Foster
Telephone: [redacted]
Date: 17 February 2011

CTS No. 02066/11

Approved: [Insert title of Dir/ED/GM/RSD]
Approved: Debbie Best, DDG WEO
Approved: Director-General

~~full five years earlier than expected and storing 103,000 megalitres, which is able to be connected to the Water Grid when required.~~

- Later this week, Seqwater will commence a steady controlled gate release from Wivenhoe Dam, discharging around 30,000 megalitres per day over about nine days.
- There are seven bridges immediately below Wivenhoe. This release will affect only three – Twin Bridges, Savages Crossing and Colleges Crossing. These three bridges will be closed to traffic during the release period. There are alternative routes available in each of these communities.
- These releases will not impact tides and therefore will not affect Brisbane city and suburbs.
- It is also important to remember this is an interim measure for the remainder of the summer.
- The longer term approach will be shaped by the Commission of Inquiry's outcomes.

BACKGROUND

- Background documents attached

Contact: Mike Foster
Telephone: [redacted]
Date: 17 February 2011

CTS No. 02066/11

Approved: [Insert title of Dir/ED/GM/RSD]
Approved: Debbie Best, DDG WEO
Approved: Director-General

Department of Environment and Resource Management – Parliamentary Briefing Note	
To	Minister Robertson
Prepared for	Parliamentary sittings 15-17 February 2011

WIVENHOE DAM operations in relation to the January 2011 flood event

KEY POINTS

- Wivenhoe and Somerset Dams can only help manage the flood waters from the Upper Brisbane, which comprises of approximately 50% of the total Brisbane River catchment.
- Based on the Brisbane City Council flood damage model, without Wivenhoe Dam, up to 13,000 more houses may have been flooded and major flooding may have lasted up to three days longer. It is estimated Wivenhoe Dam may have prevented up to $1.6 billion of damages.
- Wivenhoe and Somerset Dams are required to operate during a flood event strictly in accordance with Manual of Operational Procedures for Flood Mitigation, which is approved by the Office of the Dam Safety Regulator.
- The Government announced Commission of Inquiry will examine the management of Wivenhoe Dam during the flood event and whether any operational improvements are required into the future.

RESPONSE

Contact: Mike Foster
Telephone: [redacted]
Date: 10 February 2011
CTS No.

Approved: Peter Borrows, CEO Seqwater
Approved:
Approved:

- From 13 December 2010 to 11 January 2011, South East Queensland experienced unprecedented rainfall, which resulted in a number of controlled flood gate releases from Wivenhoe, Somerset and North Pine Dams.
- The rainfall over this period culminated in the January 2011 flood event.
- During the event Seqwater advises Wivenhoe and Somerset dams helped to manage flood waters from the upper Brisbane catchment by controlling the release of 2,650,000 million ML of flood water. This is 1,240,000 million ML more than the 1974 floods.
- Seqwater estimates that the management of Wivenhoe Dam during the flood event resulted in reduction of flood peak of up to 2.5 metres in the Brisbane CBD.
- Seqwater is required to operate Wivenhoe, Somerset and North Pine dams in accordance with a range of regulatory requirements including the flood mitigation strategies contained within the Manuals of Operational Procedures for Flood Mitigation.
- Seqwater has a Dam Safety Management Program approved by the State's Dam Safety Regulator, as well as a Flood Control Centre.
- The Manuals and their operating procedures have been reviewed by some of Australia's best water experts and are

based on detailed hydrological analysis and technical assessments of dam safety.

- The Government announced a Commission of Inquiry on 17 January 2011 to examine the management of Wivenhoe Dam over this period and whether any operational improvements are required into the future.
- Seqwater is required by the Office of the Dam Safety Regulator to provide a detailed report within six weeks of the January flood event.
- This report, once finalised, will also be provided to the Commission of Inquiry.
- Seqwater is also currently undertaking a process to identify whether any damage has been sustained to its infrastructure as a result of the flood event. As part of this process, and as a matter of urgency, dam and weirs are being inspected by independent experts to determine the structural integrity of that infrastructure.
- Seqwater has advised that the structural integrity of Wivenhoe, Somerset and North Pine Dams remains intact.
- Seqwater is currently undertaking small operational releases from both Somerset and Wivenhoe.
- The Grid 12 dams are currently at 100% combined capacity with Wivenhoe, Somerset and North Pine Dams all at about

100% capacity. **(dam levels to be updated on Tuesday 15 February 2011 am)**

- On Sunday 13 February I announced the State Government had received and accepted a recommendation from Seqwater to temporarily reduce Wivenhoe Dam levels to 75% of the Full Supply Level (FSL) for the remainder of the wet season.
- The recommendation balanced the region's drinking water security and flood mitigation and was based on Seqwater modelling which was peer reviewed by external experts.

BACKGROUND

Ability for Wivenhoe and Somerset dams to manage floods in the Brisbane River

- There are 4 major catchments that impact on flooding in Brisbane (Upper Brisbane, Lockyer; Bremer and local creeks).
- The contribution of each of these individual catchments depends on where the rain falls.

Impacts of Wivenhoe and Somerset Dams

- During the January 2011 flood event, it is estimated that Wivenhoe Dam reduced the flood peak by up to 2.5 metres in the Brisbane CBD.
- During the flood event controlled 2,650,000 mega litres (ML) of floodwater passed through Wivenhoe and Somerset Dams. This is 1,240,000 ML more than in 1974.
- Highest flow rate in the Brisbane River in the city in 1974 has historically been accepted as 9,500 cubic metres per second (this may be reassessed at some stage).
- The estimated flow from this event may have been up to 4,500 cubic metres per second greater if Wivenhoe Dam did not exist.

Operation of Wivenhoe and Somerset dams

- Detailed Operational Procedures for flood mitigation have been developed by leading water experts over many years.
- The clear decision making process in the Manual has been established since 1992. Subsequently, the Manual was reviewed during the Brisbane Valley Flood Damages Minimisation Study in 2006, with the latest comprehensive review of the Manual undertaken in 2009. Both of these reviews have included expert review panels comprising key stakeholders, with the most recent review involving representatives from DERM, BOM, BCC and SunWater.

Rainfall forecasts

Contact: Mike Foster
Telephone: [redacted]
Date: 10 February 2011
CTS No.

Approved: Peter Borrows, CEO Seqwater
Approved:
Approved:

- There is a significant element of uncertainty in rainfall forecasting, even though the Bureau of Meteorology uses the best technology available, and highly-qualified and experienced experts.
- Wivenhoe and Somerset dam operations were based on forecasts provided by the Bureau of Meteorology and observed rain on the ground.
- The rainfall during the critical period of this event significantly exceeded the Bureau of Meteorology forecasts.

Large releases earlier

- Releasing large volumes of water over the weekend prior to the 11 January 2011 event would have had major impacts on the rural communities of the Brisbane Valley. Bridges would have been cut and communities would have been isolated with little notice.
- Such a release of large volumes of water at that time would have not been accordance with the strategies detailed in the Manual.
- Over the weekend, neither rainfall forecasts nor the observed rain on the ground indicated that urban areas would be impacted.

Increases above 200% (level of fuse plugs)

- Wivenhoe Dam is not designed to overtop. If it did, the dam would fail and the resulting damage and loss of life could be as much as 100 to 1,000 times greater than that currently being experienced.
- To prevent overtopping, the dam has been designed with fuse plugs, the first one opens when it reaches just more than 200% of the FSL.
- Once opened, the rate of release through these plugs cannot be varied. Although through the use of the flood gates, by either increasing or decreasing gate releases, the total volume being released from the dam can be varied.
- The plugs continue to release water at this rate until the dam reduces to full supply level.
- Seqwater managed to control the flood releases during the January 2011 event to avoid initiating the fuse plugs
- The fuse plugs would take four to six months of dry weather to repair, and severely restrict the capability to manage further flood events during this period.
- In accordance with the Manual, flood operations are managed to ensure a flood buffer still exists to allow for possibilities of further extensive inflows.

Department of Environment and Resource Management – Parliamentary Briefing Note	
To	Minister Robertson
Prepared for	Parliamentary sittings 8-10 March 2011~~15-17 February 2011~~

WIVENHOE 25 PER CENT REDUCTION

KEY POINTS

- Seqwater has recommended to the Government that the water level in Wivenhoe Dam be temporarily reduced to 75 per cent of full supply.
- The recommendation was based on Seqwater modelling which involved 90 permutations of nine different flood events.
- The modelling was ~~has been~~ peer reviewed by external experts.
- The recommendation follows advice from the SEQ Water Grid Manager that such a reduction would not impact on the drinking water security of the region and acknowledges the region remains in the middle of the wet season.
- Dam inflows from the January event were almost double that of the 1974 flood and have established another flood benchmark
- The scheduled release pattern ~~Releases~~ started from 6.00 am Sunday, 20 February 2011 ~~and ended~~ and ceased 3.00 pm Wednesday, 2 March 2011.
- This water release did~~will~~ not impact tides and therefore did~~will~~ not affect Brisbane city and suburbs. It is an interim measure for the remainder of the summer.

Contact: Mike Foster
Telephone: [redacted]
Date: 17 February 2011

Approved: ~~[Insert title of Dir/ED/GM/RSD]~~
Approved: ~~Debbie Best, DDG WEO~~
Approved: ~~Director-General~~

CTS No. 023482066/11

- Three of the seven bridges below Wivenhoe Dam were closed by local government for the duration of the releases and have now been re-opened. These include Twin Bridges, Savages Crossing and Colleges Crossing. In each case there are alternative routes available to the community
- It is also expected that the water released will be recouped in the coming years.

RESPONSE

- The scheduled release pattern ~~Water releases~~ to reduce Wivenhoe Dam's Full Supply Level ~~(FSL)~~ commenced Sunday, 20 February 2011 at 6.00 am and ceased~~with the gates closed~~ at 3.00 pm Wednesday, 2 March 2011.
- The release period of nine days had to be extended by almost 36 hours due to storm activity across the Wivenhoe catchment and the Brisbane River catchment below the dam on Monday, 21 February 2011.
- As a result, Wivenhoe Dam release rates were reduced for a 24 hour period, to allow flows down the Lockyer to sufficiently pass.
- In addition, Wivenhoe Dam received inflows of up to ~~xxxx~~40,~~35~~,000 megalitres~~ML~~ (or the equivalent of about ~~xxxx~~43 per cent capacity) from the surrounding catchment.

-

- The releases reduced Wivenhoe Dam to just above 76% Full Supply Level, which equates to a reduction of approximately 280,000 megalitres~~ML~~.
- Smaller releases are continuing to take the dam down to 25 per cent and manage minor ongoing inflows into Somerset and Wivenhoe dams.
- Significant public communication, including print and radio advertisements, occurred prior to the release being undertaken. Regular ~~Daily~~ media updates were also been provided for the duration of the release period.
- The releases were undertaken after consultation with the Somerset Regional Council, Ipswich Regional Council and Brisbane City Council,
- The release flow rates adopted were deliberately designed to ensure that no ~~downstream bridges were closed which would have resulted in~~ communities and residents ~~being~~ were cut off.
- The~~All~~ three bridges impacted by the release – Twin Bridges, Savages Crossing and Colleges Crossing – have been re-opened to traffic. In each case there were alternative routes available to the community over the duration of the release.
- The decision ~~recommendation~~ to reduce Wivenhoe Dam's Full Supply Level was not made lightly. It is a

strategy~~recommendation~~ which balances drinking water security and flood mitigation.

—The release strategy was aimed at creating an additional flood buffer zone for the rest of the wet season quickly and with as minimal impact on the community as possible.

•

•

•~~Seqwater has recommended to the Government that the water level in Wivenhoe Dam be temporarily reduced to 75 per cent of full supply.~~

•~~The recommendation was not made lightly. It is a recommendation which balances drinking water security and flood mitigation.~~

•~~The recommendation follows Seqwater modelling and is a precaution given the second strongest La Nina pattern in history and its influence on the current wet season.~~

—:

•~~Seqwater had advised that a reduction in Wivenhoe Dam's storage level to 75 per cent of Full Supply provides appreciable flood mitigation benefits ahead of any major rain events that may occur during the remainder of the current wet season.~~

Contact: Mike Foster
Telephone: [redacted]
Date: 17 February 2011
CTS No. 023482066/11

Approved: ~~[Insert title of Dir/ED/GM/RSD]~~
Approved: ~~Debbie Best, DDG WEO~~
Approved: ~~Director-General~~

- The inflow into Wivenhoe Dam from this January flood event was almost double that of the 1974 flood. Water was flowing into the Dam 50 per cent faster than it was in 1974.
- That data has now been considered in Seqwater's modelling. This modelling has been peer reviewed by external experts, and involved 90 permutations of nine different flood events.
- The SEQ Water Grid Manager has advised that there would be no objection from a water security perspective to the temporary reduction.
- Later this week, Seqwater will commence a steady controlled gate release from Wivenhoe Dam, discharging around 30,000 megalitres per day over about nine days.
-
- There are seven bridges immediately below Wivenhoe. This release will affect only three – Twin Bridges, Savages Crossing and Colleges Crossing. These three bridges will be closed to traffic during the release period. There are alternative routes available in each of these communities.
- These releases will not impact tides and therefore will not affect Brisbane city and suburbs.
- It is also important to remember this is an interim measure for the remainder of the summer.
- The longer term approach will be shaped by the Commission of Inquiry's outcomes.

Contact: Mike Foster
Telephone: [redacted]
Date: 17 February 2011
CTS No. 023482066/11

Approved: [Insert title of Dir/ED/GM/RSD]
Approved: Debbie Best, DDG WEO
Approved: Director-General

BACKGROUND

- ~~Background documents attached~~
-

Contact: Mike Foster
Telephone: [redacted]
Date: 17 February 2011

CTS No. 023482066/11

Approved: ~~[Insert title of Dir/ED/GM/RSD]~~
Approved: ~~Debbie Best, DDG WEO~~
Approved: ~~Director General~~

Ufer Cathy

From:	Williamson Liliana on behalf of DLO EWU
Sent:	Wednesday, 16 March 2011 11:45 AM
To:	Corro Minister ERM
Cc:	Williams Lynette
Subject:	FW: I/11/0126- Meeting with Phil Hennessey, SEQ Water Grid Chair re Decentralisation to Ipswich
Follow Up Flag:	Follow up
Flag Status:	Yellow
Attachments:	img-3151548-0001.pdf; I110126 due 22 March- Meeting with Phil Hennessey, SEQ Water Grid Chair re Decentralisation to Ipswich.docx

Dear MECU Folks,

Could you please organise a meeting brief for a meeting with Phil Hennessey, the SEQ Water Grid Chair to discuss Decentralisation to Ipswich on Tuesday, 29 March 2011.

Lynette, Minister Robertson's Office has requested that Departmental Representatives be nominated to attend this meeting. Are you able to advise of an appropriate departmental representative for this meeting?

Please provide approved brief to the Minister's office by **COB Tuesday, 22 March 2011.**
Kind regards,

Liliana Williamson
Departmental Liaison Officer (Water Utilities)
Office of the Minister for Energy and Water Utilities
Department of Environment and Resource Management
Telephone: ([redacted] QNET: 47077
Mobile: [redacted]
Email: liliana.williamson@derm.qld.gov.au
Web: www.derm.qld.gov.au

SEQ Water Grid

RECEIVED

1 March 2011

The Honorable Rachel Nolan
Minister for Finance and The Arts
GPO Box 149
BRISBANE QLD 4001

The Honorable Stephen Robertson
Minister for Energy and Water Utilities
PO Box 15216
CITY EAST QLD 4002

Dear Ministers

Decentralisation to Ipswich – Water Grid Entities

The water grid entities have been in discussions with the Department of Public Works and Justice and Attorney General for the last twelve months in relation to the decentralisation to Ipswich.

In late December 2010, these agencies provided an update on the proposed redevelopment of a site at Ipswich and a possible timetable of actions.

As you are aware, access to necessary facilities and resources was put to the test in the flood crisis. As a result of these events, the Chairs have requested that the working group, comprising of Executives from each the water grid entities, conducts a thorough capability review to determine the resources and facilities necessary to enable the Water Grid to operate continuously in such events.

This review will focus on the needs for 24/7 access, IT and power supply, the ability of staff to be able to attend work during an extreme weather event and accessibility for Ministerial and agency meetings and updates.

The Chairs would appreciate the opportunity to meet with you both to discuss these matters once the review is finalised.

Yours faithfully

[redacted]

Phil Hennessy	David Gray	Gary Humphrys	Steve Roberts
Chair Seqwater	Chair WaterSecure	Chair SEQ Water Grid Manager	Chair LinkWater

[redacted]

OFFICE OF THE MINISTER FOR ENERGY & WATER UTILITIES

BRIEF REQUEST

MO I/1X/XXXX	**I/11/0126**
DUE DATE	**22 March**
MEETING / FUNCTION TITLE	**Meeting with Phil Hennessey, SEQ Water Grid Chair re Decentralisation to Ipswich**
DATE & TIME	**29 March @ 11am**
DEPT'L OFFICER REQUIRED	**Yes**
WHO IS BRIEF FOR	**Minister**
SPEECH REQUIRED	**No**

IMPORTANT INSTRUCTIONS

- Refer to attachments for background information and other instructions
- If speech is provided - speech notes and brief to also be forwarded to NRMET@ministerial.qld.gov.au
- Attachments should include the original meeting request or event invitation but should not include function proformas, speech notes or administrative email chains

Department of Environment and Resource Management – Parliamentary Briefing Note

To Minister Robertson

Prepared for Parliamentary sittings 22-24 ~~8-10~~ March 2011

28

WIVENHOE 25 PER CENT REDUCTION

KEY POINTS

- Following the January 2011 flood event, Seqwater ~~has~~ recommended to the Government that the water level in Wivenhoe Dam be temporarily reduced to 75 per cent of full supply.
- The recommendation was based on Seqwater modelling which involved 90 permutations of nine different flood events.
- The modelling was peer reviewed by external experts.
- The recommendation followed~~s~~ advice from the SEQ Water Grid Manager that such a reduction would not impact on the drinking water security of the region and acknowledges the region remains in the middle of the wet season.
- Dam inflows from the January event were almost double that of the 1974 flood and have established another flood benchmark
- The scheduled release pattern started from 6.00 am Sunday, 20 February 2011 and ceased 3.00 pm Wednesday, 2 March 2011.
- This water release did not impact tides and therefore did not affect Brisbane city and suburbs. Water was released as an interim measure for the remainder of the summer season.

Contact: Mike Foster
Telephone: [redacted]
Date: 11~~4~~March~~7 February~~ 2011
CTS No. 03917~~2348~~/11

Approved: DDG, WEO
Approved:
Approved:

- Three of the seven bridges below Wivenhoe Dam were closed by the local government for the duration of the releases and were ~~have now been~~ re-opened shortly afterwards. These included Twin Bridges, Savages Crossing and Colleges Crossing. In each case there were~~as~~ alternative routes available to the community.
- It is also expected that the water released will be recouped in the coming years.
- Minor releases from Wivenhoe Dam are continuing, to manage current inflows and bring the dam down to the targeted 75 per cent of full supply level.
- Twin Bridges are currently closed due to these releases, however, alternative routes are available.

RESPONSE

- The scheduled release pattern to reduce Wivenhoe Dam's Full Supply Level commenced Sunday, 20 February 2011 at 6.00 am and ceased at 3.00 pm Wednesday, 2 March 2011.
- The release period of nine days was~~had to be~~ extended by almost 36 hours due to storm activity across the Wivenhoe catchment and the Brisbane River catchment below the dam on Monday, 21 February 2011.

Contact: Mike Foster
Telephone: [redacted]5
Date: 11~~March7 February~~ 2011
CTS No. 039172348/11

Approved: DDG, WEO
Approved:
Approved:

- As a result, Wivenhoe Dam release rates were reduced for a 24 hour period, to allow flows down the Lockyer to sufficiently pass.

- In addition, Wivenhoe Dam received inflows of up to 40,000 megalitres (or the equivalent of about 4 per cent capacity) from the surrounding catchment.

- Significant public communication, including print and radio advertisements, occurred prior to the release being undertaken. Regular media updates were also provided for the duration of the release period.

- The releases were undertaken after consultation with the Somerset Regional Council, Ipswich Regional Council and Brisbane City Council,

- The release flow rates adopted were deliberately designed to ensure that no communities and residents were cut off.

- The three bridges impacted by the release – Twin Bridges, Savages Crossing and Colleges Crossing – were ~~have been~~ re-opened to traffic shortly afterwards. In each case, there were alternative routes available to the community over the duration of the release.

- Minor releases associated with the normal operation of Wivenhoe Dam are continuing, to manage current inflows and maintain the dam at the targeted 75 per cent of full supply level.

Contact: Mike Foster
Telephone: [redacted]
Date: 11~~4~~March~~7 February~~ 2011
CTS No. 039172348/11

Approved: DDG, WEO
Approved:
Approved:

- Twin Bridges are currently closed due to these releases; however, alternative routes are available.
-

- The decision to reduce Wivenhoe Dam's Full Supply Level was not made lightly. It is a strategy which balances drinking water security and flood mitigation.
- The release was recommended by Seqwater after its recent hydrology analysis and was a precaution given the second strongest La Nina pattern in history continues to influence the current wet season.

- Seqwater made its recommendation recognising the extreme January 2011 event that left the catchments soaked and the water tables full
- The release strategy was aimed at creating an additional flood buffer zone for the rest of the wet season quickly and with as minimal impact on the community as possible.
- It is also important to remember this is an interim measure for the remainder of the summer season.
- The release represents an abundance of caution.
- The longer term approach will be shaped by the Commission of Inquiry's outcomes.

BACKGROUND

-

Contact: Mike Foster
Telephone: [redacted]
Date: 11~~7~~ March~~ February~~ 2011
CTS No. 03917~~2~~348/11

Approved: DDG, WEO
Approved:
Approved:

Department of Environment and Resource Management – Parliamentary Briefing Note

To Minister Robertson

Prepared for Parliamentary sittings 22-24~~8-10~~ March 2011

29

WIVENHOE DAM - Operations in Relation to the January 2011 Flood Event

KEY POINTS

- Wivenhoe and Somerset Dams can only help manage the flood waters from the Upper Brisbane River, which comprises approximately 50 per cent of the total Brisbane River catchment.
- Based on the Brisbane City Council flood damage model, without Wivenhoe Dam, up to 14,000 more houses may have been flooded and major flooding may have lasted up to three days longer. It is estimated Wivenhoe Dam may have prevented up to $5 billion of damages.
- Wivenhoe and Somerset Dams are required to operate during a flood event strictly in accordance with the Manual of Operational Procedures for Flood Mitigation, which is approved by the Office of the Dam Safety Regulator.
- The Government announced Commission of Inquiry will examine the management of Wivenhoe Dam during the flood event and whether any operational improvements are required into the future.

Contact: Mike Foster
Telephone: [redacted]
Date: 11 March~~10 February~~ 2011
CTS No. 03290~~2333~~/11

Approved: Peter Borrows, CEO Seqwater
Approved:
Approved:

- Seqwater has provided a report on the January flood event to the Dam Safety Regulator and the Commission of Inquiry. This report is publically available on the Department of Environment and Resource Management website.
- Minor releases from Wivenhoe Dam are continuing, to manage current inflows and bring the dam down to the targeted 75 per cent of full supply level.

RESPONSE

- From 13 December 2010 to 11 January 2011, south east Queensland experienced unprecedented rainfall, which resulted in a number of controlled flood gate releases from Wivenhoe, Somerset and North Pine Dams.
- The rainfall over this period culminated in the January 2011 flood event.
- During the event Wivenhoe and Somerset dams helped to manage flood waters from the upper Brisbane catchment by controlling the release of 2,650,000 million megalitres of flood water. This is 1,240,000 million megalitres more than the 1974 floods.
- Seqwater estimates that the management of Wivenhoe Dam during the flood event resulted in an approximate two metre reduction to the flood peak in the Brisbane CBD.

- Seqwater is required to operate Wivenhoe, Somerset and North Pine dams in accordance with a range of regulatory requirements including the flood mitigation strategies contained within the Manuals of Operational Procedures for Flood Mitigation.

- Seqwater has a Dam Safety Management Program approved by the State's Dam Safety Regulator, as well as a Flood Control Centre.

- The Manuals and their operating procedures have been reviewed by some of Australia's best water experts and are based on detailed hydrological analysis and technical assessments of dam safety.

- The Government announced a Commission of Inquiry on 17 January 2011 to examine the management of Wivenhoe Dam over this period and whether any operational improvements are required into the future.

- Seqwater has now provided a detailed report on the January event to the Dam Safety Regulator.

- This report will also be provided to the Commission of Inquiry.

- Seqwater is also currently undertaking a process to identify whether any damage has been sustained to its infrastructure as a result of the flood event. As part of this process, and as a matter of urgency, dams and weirs are being inspected by

independent experts to determine the structural integrity of that infrastructure.

- Seqwater has advised that the structural integrity of Wivenhoe, Somerset and North Pine Dams remains intact.

BACKGROUND

Ability for Wivenhoe and Somerset dams to manage floods in the Brisbane River

- There are four major catchments that impact on flooding in Brisbane (Upper Brisbane, Lockyer; Bremer and local creeks).
- The contribution of each of these individual catchments depends on where the rain falls.

Impacts of Wivenhoe and Somerset Dams

- During the January 2011 flood event, it is estimated that Wivenhoe Dam reduced the flood peak by up to 2.5 metres in the Brisbane CBD.
- During the flood event controlled 2,650,000 megalitres of floodwater passed through Wivenhoe and Somerset Dams. This is 1,240,000 megalitres more than in 1974.
- Highest flow rate in the Brisbane River in the city in 1974 has historically been accepted as 9,500 cubic metres per second (this may be reassessed at some stage).
- The estimated flow from this event may have been up to 4,500 cubic metres per second greater if Wivenhoe Dam did not exist.

Operation of Wivenhoe and Somerset dams

- Detailed Operational Procedures for flood mitigation have been developed by leading water experts over many years.
- The clear decision making process in the Manual has been established since 1992. Subsequently, the Manual was reviewed during the Brisbane Valley Flood Damages Minimisation Study in 2006, with the latest comprehensive review of the Manual undertaken in 2009. Both of these reviews have included expert review panels comprising key stakeholders, with the most recent review involving representatives from the Department of Environment and Resource Management (DERM), Bureau of Meteorology (BOM), Brisbane City Council (BCC) and SunWater.

Rainfall forecasts

- There is a significant element of uncertainty in rainfall forecasting, even though the Bureau of Meteorology uses the best technology available, and highly-qualified and experienced experts.
- Wivenhoe and Somerset dam operations were based on forecasts provided by the Bureau of Meteorology and observed rain on the ground.
- The rainfall during the critical period of this event significantly exceeded the Bureau of Meteorology forecasts.

Large releases earlier

- Releasing large volumes of water over the weekend prior to the 11 January 2011 event would have had major impacts on the rural communities of the Brisbane Valley. Bridges would have been cut and communities would have been isolated with little notice.

- Such a release of large volumes of water at that time would not have been in accordance with the strategies detailed in the Manual.
- Over the weekend, neither rainfall forecasts nor the observed rain on the ground indicated that urban areas would be impacted.

Increases above 200 per cent (level of fuse plugs)

- Wivenhoe Dam is not designed to overtop. If it did, the dam would fail and the resulting damage and loss of life could be as much as 100 to 1,000 times greater than that currently being experienced.
- To prevent overtopping, the dam has been designed with fuse plugs, the first one opens when it reaches just more than 200 per cent of the FSL.
- Once opened, the rate of release through these plugs cannot be varied. Although through the use of the flood gates, by either increasing or decreasing gate releases, the total volume being released from the dam can be varied.
- The plugs continue to release water at this rate until the dam reduces to full supply level.
- Seqwater managed to control the flood releases during the January 2011 event to avoid initiating the fuse plugs.
- The fuse plugs would take four to six months of dry weather to repair, and severely restrict the capability to manage further flood events during this period.
- In accordance with the Manual, flood operations are managed to ensure a flood buffer still exists to allow for possibilities of further extensive inflows.

CTS No. 05204/11

SEQ Water Grid
MINISTERIAL BRIEFING NOTE

Advisor	OK
Dated	/ /
Approved	Not Approved Noted
Further information required	
Minister.....	
Dated	/ /

TO: **Minister for Environment and Resource Management, and**
Minister for Energy and Water Utilities

SUBJECT: North Pine Dam

REQUESTED BY

- This Brief has been requested by the Minister's Office by 30 March 2011.

TIMEFRAME

- Noting of this brief is non urgent. The MECS due date is 30 March 2011.

RECOMMENDATION

It is recommended that the Ministers:

- **note** that the SEQ Water Grid Manager, Seqwater, Department of Environment and Resource Management (DERM) and the Queensland Water Commission (QWC) have received correspondence from the Chief Executive Officer (CEO) of Moreton Bay Regional Council (MBRC), in relation to North Pine Dam water release strategies.
- **note** that the correspondence received from the CEO of MBRC requests that the matter, with respect to the Wivenhoe and Somerset Dams water release strategies, be considered with respect to North Pine Dam.
- **note** that the matters broadly raised by Cr David Dwyer in correspondence addressed to the Premier **(attachment A)** is broadly similar to the matters raised by the CEO of MBRC **(attachment B)**.
- **note** that Seqwater has engaged with MBRC to ascertain the benefits or otherwise of the downstream impacts of lowering the Full Supply Level (FSL) of North Pine Dam.

BACKGROUND

- Unlike Wivenhoe Dam, North Pine Dam has been designed as drinking water storage with no significant flood storage compartment above FSL.
- North Pine Dam is part of the primary urban water supply for South East Queensland. Its current FSL is contained in the Moreton Resource Operations Plan (ROP), which was developed by DERM in accordance with the *Water Act 2000*.
- Seqwater is currently obliged under its Flood Mitigation Manual for North Pine Dam, approved by the Dam Safety Regulator, to ensure that the dam storage is retained at FSL at the conclusion of a flood event.
- Following flood and release events, Seqwater is required to provide a report on the operations of dam during the event to the Dam Safety Regulator. On 11 March 2011, Seqwater finalised its report into the January 2011 flood event at North Pine Dam and it was provided to both the Regulator and the Commission of Inquiry into the Queensland floods.
- The report, which has been published on the Department of Environment and Resource Management website, concluded that:
  - During the January 2011 flood event, North Pine Dam was operated in accordance with the Manual.
  - The January 2011 flood event was the largest flood in the recorded flood history of the region.

Author	Cleared by	Cleared by	Recommended:
Name: Jade Simmons Position: Snr Correspondence Officer Tel No: [redacted] Date: 30 March 2011	Name: Barry Dennien Position: CEO SEQWG[redacted] Tel No: [redacted]	Name: Position: Tel No:	Name: John Bradley Director-General, DERM Tel No: [redacted] Date:
	Name: Position: Tel No:	Name: Position: Tel No:	

File Ref:

- North Pine received record inflows over the January flood event.
- The safety of the North Pine Dam was maintained at all times during the event and the dam did reduce downstream flows.
- During the event Seqwater, as required, provided information to the MBRC and other relevant agencies on flood releases being made from the Dam.

- When water is released from North Pine Dam during a release event, Young's Crossing Road, below the dam wall, is often inundated.
- After consultation with the MBRC, where possible, gate operations to release water from North Pine Dam are conducted at night, to ensure minimal disruption to the surrounding area with the closure of Young's Crossing Road. MBRC has responsibility for road closures and advising residents.

CURRENT ISSUES

- The SEQ Water Grid Manager, Seqwater, DERM and the Queensland Water Commission have received correspondence from the CEO of MBRC, in relation to the issue broadly raised by Cr David Dwyer in correspondence to the Premier, dated 3 February 2011 **(attachment A).**
- DERM is preparing a response to the CEO of MBRC, offering the opportunity for council to discuss the matter further with the Director General of DERM.
- The correspondence from the CEO of MBRC to the Water Grid Manager states that Council is seeking a review of the water level management and water release strategies and processes for North Pine Dam, particularly when the dam is full or at a high level during actual and forecast prolonged wet periods.
- The correspondence also details that after the January flood event, MBRC resolved, during their Coordination Meeting of 15 February 2011, *'that the Chief Executive Officer write to the Chair of the Queensland's Floods Commission of Inquiry requesting that the matters under consideration with respect to the Wivenhoe and Somerset Dams water release strategies be considered with respect to North Pine Dam'.*
- After receipt of MBRC's correspondence, the SEQ Water Grid Manager wrote to Seqwater, enquiring if any consideration is being given to improving North Pine Dam's flood mitigation, similar to those considerations that were undertaken by Seqwater for Wivenhoe and Somerset Dams **(attachment C).**
- In response to MBRC correspondence, Seqwater on 22 February 2011 sought clarification around the level of service required by MBRC in relation to flood immunity and offered to work with the MBRC on a range of modelling tasks to ascertain the benefits or otherwise of the downstream impacts of lowering the FSL of North Pine Dam
- MBRC has not yet formally responded to Seqwater correspondence, however through discussions with the MBRC, Seqwater has commenced a project to model flows and river levels.
- The initial modelling results, which are currently being peer reviewed, shows that the FSL would need to be reduced to 50% capacity for any appreciable reduction in peak water outflows for the January 2011 event. There was no significant reduction in peak outflows at the 80% FSL referred to in the Cr David Dwyer letter. The MBRC is yet to be briefed on these initial results.
- The second phase of the work will involve modelling the impact of different water outflows from North Pine Dam on river levels below the dam wall using modelling developed by the MBRC. MBRC has approved the use of the model by Seqwater.
- The third phase of the work will involve Seqwater working directly with MBRC to model the extent of property and residential flooding based on those river levels. Based on the results of this MBRC would then need to assess the implications of river levels, planning instruments and development approvals.

Author	Cleared by	Cleared by	Recommended:
Name: Jade Simmons Position: Snr Correspondence Officer Tel No: [redacted] Date: 30 March 2011	Name: Barry Dennien Position: CEO SEQW Tel No: [redacted]	Name: Position: Tel No:	Name: John Bradley Director-General, DERM Tel No: [redacted] Date:
	Name: Position: Tel No:	Name: Position: Tel No:	

File Ref:

- In relation to Wivenhoe Dam, the Director General of DERM approved the current temporary reduction in FSL of Wivenhoe through the approval of an interim program under the Moreton Resource Operations Plan (ROP).
- This was based on:
    - o advice from the Water Grid Manager that the reduction in FSL would not affect the short term drinking water security for the region; and
    - o The extreme nature of the January 2011 flood event
    - o subsequent recommendation from Seqwater in respect of the flood mitigation benefits associated with the temporary reduction to 75%.

RESOURCE/IMPLEMENTATION IMPLICATIONS

- There are no resource or implementation implications.

PROPOSED ACTION

- Seqwater will continue to work with MBRC.
- Seqwater intends to provide advice to the Commission of Inquiry ahead of its interim report in August 2011 which will consider the region's flood preparedness ahead of the next wet season.
- For temporary water level changes to North Pine Dam, the SEQ Water Grid Manager will consider the impacts related to ability to comply with the risk criteria under the South East Queensland System Operating Plan.
- For permanent water level changes to North Pine Dam, the QWC will need to consider long-term water security impacts.

OTHER INFORMATION

- *Consultation:* N/a
- *Legislation:* N/a
- *Key Communication Messages:* N/a

MINISTER'S COMMENTS

ATTACHMENTS

- Attachment A – Correspondence dated 3 February 2011 to the Premier, from Cr David Dyer
- Attachment B - Correspondence dated 9 March 2011 to the Water Grid Manager, from CEO of MBRC
- Attachment C – Correspondence dated 14 March 2011 to Seqwater, from Water Grid Manager

Author	Cleared by	Cleared by	Recommended:
Name: Jade Simmons Position: Snr Correspondence Officer Tel No: [redacted] Date: 30 March 2011	Name: Barry Dennien Position: CEO SEQWG[redacted] Tel No: [redacted] Name: Position: Tel No:	Name: Position: Tel No: Name: Position: Tel No:	Name: John Bradley Director-General, DERM Tel No: [redacted] Date:

File Ref:

Department of Environment and Resource Management – Parliamentary Briefing Note	
To	Minister Robertson
Prepared for	Parliamentary sittings ~~22-24~~ 5-7 April ~~March~~ 2011

33

WIVENHOE DAM - 25 PER CENT REDUCTION

KEY POINTS

- Following the January 2011 flood event, Seqwater recommended to the Government that the water level in Wivenhoe Dam be temporarily reduced to 75% of full supply.
- The recommendation was based on Seqwater modelling which involved 90 permutations of nine different flood events.
- The modelling was peer reviewed by external experts.
- The recommendation followed advice from the SEQ Water Grid Manager that such a reduction would not impact on the drinking water security of the region and acknowledges the region remains in the middle of the wet season.
- Dam inflows from the January event were almost double that of the 1974 flood and have established another flood benchmark
- The scheduled release pattern started from 6.00 am Sunday, 20 February 2011 and ceased 3.00 pm Wednesday, 2 March 2011.
- This water release did not impact tides and therefore did not affect Brisbane city and suburbs. Water was released as an interim measure for the remainder of the summer season.

Contact: Mike Foster
Telephone: [redacted]
Date: 11 ~~April~~ ~~March~~ 2011
CTS No. 04994~~3917~~/11

Approved: Barry Dennien, CEO, SEQWGM ~~DDG, WEO~~
Approved:
Approved:

- Three of the seven bridges below Wivenhoe Dam were closed by the local government for the duration of the releases and were re-opened shortly afterwards. These included Twin Bridges, Savages Crossing and Colleges Crossing. In each case there were alternative routes available to the community.
- There is a high probability~~It is also expected~~ that the water released will be recouped in the coming years.
- Following the end of the traditional wet season on March 31 2011, Seqwater advised the State Government it intended to allow Wivenhoe to return to 100% Full Supply Level.

~~This followed advice to Seqwater from the Water Grid Manager and the Queensland Water Commission.~~

~~Minor releases from Wivenhoe Dam are continuing, to manage current inflows and bring the dam down to the targeted 75% of full supply level.~~

- ~~Twin Bridges are currently closed due to these releases, however, alternative routes are available.~~

RESPONSE

Following the end of the traditional wet season Seqwater has advised the State that Wivenhoe Dam will now be allowed to return to 100% drinking water capacity. The Dam gates were closed on Friday 1 April 2011.

•

Contact: Mike Foster
Telephone: [redacted]
Date: 1~~4~~April~~March~~ 2011
CTS No. 04994~~3917~~/11

Approved: Barry Dennien, CEO, SEQWGM~~DDG, WEO~~
Approved:
Approved:

- As part of its normal management processes Seqwater will continue to monitor Dam levels and inflows and continue to liaise closely with the Bureau of Meteorology and other relevant government agencies.

- The temporary reduction in Wivenhoe Dam Fully Supply Level to 75% was precautionary and took into account the extreme nature of the January 2011 flood event that left the catchments soaked and the water tables full

- It was also based on advice from the SEQ Water Grid Manager that such a reduction would not impact on the drinking water security of the region and acknowledged the region at that stage remained in the middle of the wet season.

—The release strategy was aimed at creating an additional flood buffer zone for the rest of the wet season quickly and with as minimal impact on the community as possible.

•

~~•The scheduled release pattern to reduce Wivenhoe Dam's Full Supply Level commenced Sunday, 20 February 2011 at 6.00 am and ceased at 3.00 pm Wednesday, 2 March 2011.~~

~~•The release period of nine days was extended by almost 36 hours due to storm activity across the Wivenhoe catchment and the Brisbane River catchment below the dam on Monday, 21 February 2011.~~

Contact: Mike Foster
Telephone: [redacted]
Date: 11~~April~~March 2011
CTS No. 04994~~3917~~/11

Approved: Barry Dennien, CEO, SEQWG~~MDDG, WEO~~
Approved:
Approved:

- ~~As a result, Wivenhoe Dam release rates were reduced for a 24 hour period, to allow flows down the Lockyer to sufficiently pass.~~

- ~~In addition, Wivenhoe Dam received inflows of up to 40,000 megalitres (or the equivalent of about 4% capacity) from the surrounding catchment.~~

- ~~Significant public communication, including print and radio advertisements, occurred prior to the release being undertaken. Regular media updates were also provided for the duration of the release period.~~

- The releases were undertaken after consultation with the Somerset Regional Council, Ipswich Regional Council and Brisbane City Council,

- The release flow rates adopted were deliberately designed to ensure that no communities and residents were cut off.

- Significant public communication, including print and radio advertisements, occurred prior to the release being undertaken. Regular media updates were also provided for the duration of the release period.

- ~~The three bridges impacted by the release – Twin Bridges, Savages Crossing and Colleges Crossing – were re-opened to traffic shortly afterwards. In each case, there were alternative~~

~~routes available to the community over the duration of the release.~~

- ~~Minor releases associated with the normal operation of Wivenhoe Dam are continuing, to manage current inflows and maintain the dam at the targeted 75% of full supply level.~~
- ~~Twin Bridges are currently closed due to these releases; however, alternative routes are available.~~
- ~~The decision to reduce Wivenhoe Dam's Full Supply Level was not made lightly. It is a strategy which balances drinking water security and flood mitigation.~~
- ~~The release was recommended by Seqwater after its recent hydrology analysis and was a precaution given the second strongest La Nina pattern in history continues to influence the current wet season.~~
- ~~Seqwater made its recommendation recognising the extreme January 2011 event that left the catchments soaked and the water tables full~~
- ~~The release strategy was aimed at creating an additional flood buffer zone for the rest of the wet season quickly and with as minimal impact on the community as possible.~~
- ~~It is also important to remember this is an interim measure for the remainder of the summer season.~~
- There is a high probability that ~~It is expected that~~ the water released will be recouped in the coming years.

Contact: Mike Foster
Telephone: [redacted]
Date: 11~~March~~April 2011
CTS No. 04994~~3917~~/11

Approved: Barry Dennien, CEO, SEQWGM~~DDG, WEO~~
Approved:
Approved:

- The Commission of Inquiry into the Queensland floods is now underway.

—The future management of the region's dams in relation to flood protection will be shaped by the Inquiry's outcomes.

~~The release represents an abundance of caution.~~

- ~~The longer term approach will be shaped by the Commission of Inquiry's outcomes.~~

Contact: Mike Foster
Telephone: [redacted]
Date: 1~~4~~April~~March~~ 2011
CTS No. 04994~~3917~~/11

Approved: Barry Dennien, CEO, SEQWGM~~DDG, WEO~~
Approved:
Approved:

Department of Environment and Resource Management – Parliamentary Briefing Note	
To	Minister Robertson
Prepared for	Parliamentary sittings <insert dates >

CHANGES TO THE FULL SUPPLY LEVEL OF WIVENHOE DAM – Water Security Impacts

KEY POINTS

- I am advised that the temporary changes to the Operational Procedures for Wivenhoe Dam may bring forward the need to operate the desalination facility at full capacity at all times.
- The draw down is made possible because water supply to South East Queensland is secure over the short- and medium-term, due to storages being full, key projects completed and ongoing water efficiency.
- Our twelve key storages are currently at 100 per cent of combined storage capacity.
- They will fall to 86 per cent of combined capacity once Wivenhoe Dam is drawn down to 75 per cent of its Full Supply Capacity. This is higher than at the same time last year, when the storages were at XX.
- Compared to last year, our security is also improved by the Hinze Dam upgrade being almost complete, Wyaralong Dam being full years earlier than expected and _ per cent of the Northern Pipeline Interconnector Stage 2 having been laid.

RESPONSE

Contact:	Approved: [Insert title of Dir/ED/GM/RSD]
Telephone:	Approved: [Insert title of ADG or DDG]
Date:	Approved: Director-General
CTS No.	

- From a water security perspective, the major impact of the draw down is upon the operation of the desalination facility.
- As I announced in December last year, the desalination facility will be operated in standby mode when key Water Grid storages are above 60 percent of capacity – producing water only when it is needed, such as in response to turbid water that is currently flowing down the Brisbane River.
- This plan remains unchanged.
- However, the draw down increases the probability of key Water Grid storages falling to 60 per cent of combined capacity over the next five years – from about 5 to 9 per cent. Should this occur, the desalination facility will need to be operated at full capacity at all times. This will ensure a more secure supply, but with increased operating costs.
- As a temporary reduction, the draw down is less likely to bring forward the reintroduction of Medium Level restrictions and the use of purified recycled water to augment Wivenhoe Dam. I am advised that there is currently a 0.1 per cent probability of this occurring within the next five years. The draw down will increase this to 0.4 per cent.
- This advice applies to a temporary reduction only. The optimal arrangements for future wet seasons will be considered as part of the forthcoming Commission of Inquiry. The Queensland Water Commission will need to assess the long-term impacts of

any permanent changes to the Operational Procedures or Full Supply Level.

BACKGROUND

- Contains contextual material for background information only
  - Background dash point
- Font: 12pt, Arial, Single linespacing
- Brief should be concise, precise and focus on the facts

Confidential or personal information should only be included in the Background section, **if necessary**.
Please delete this box if there is no confidential information

Contact:
Telephone:
Date:
CTS No.

Approved: [Insert title of Dir/ED/GM/RSD]
Approved: [Insert title of ADG or DDG]
Approved: Director-General

HOT ISSUE BRIEFING NOTE

HOT ISSUE G.X	Rainfall, Wivenhoe Dam and 75 per cent FSL
Question	What is the effect of current and forecast rainfall on Wivenhoe Dam's 75 per cent full supply level?

Issue:

- Effect of current and forecast rainfall on Wivenhoe Dam and the recommended 75 per cent of full supply level.

Answer:

Wivenhoe Dam current releases

- Wivenhoe Dam spillway gates are currently being operated, releasing 30 cubic metres per second to manage the current inflows into Somerset and Wivenhoe dams.
- Rainfall over the past <insert timeframe> has contributed <insert megalitres> or 0.5 per cent of Wivenhoe Dam's full supply level.
- The releases are ensuring that Wivenhoe Dam is kept at the recommended 75 per cent of full supply level for the remainder of the wet season.
- No bridges or crossings downstream of Wivenhoe Dam will be affected by the current releases.
- Seqwater is continuing to work with the Bureau of Meteorology to monitor rainfall and forecast weather.
- Seqwater has an extensive monitoring network of 140 gauging stations across the catchment that monitors rainfall, streamflow and dam levels.

•

Wivenhoe Dam 75 per cent full supply level

- Seqwater has recommended to the Government that the water level in Wivenhoe Dam be temporarily reduced to 75 per cent of full supply level.
- The recommendation was based on Seqwater modelling which involved 90 permutations for nine different flood events.
- The modelling was peer review by external experts.
- The recommendation followed advice from the SEQ Water Grid Manager that such a reduction would not impact on the drinking water security of the region and acknowledges the region remains in the middle of the wet season. It is expected that the raw water released will be recouped in the coming years.
- The scheduled release pattern started from 6.00am Sunday, 20 February 2011 and ceased 3.00 pm Wednesday, 2 March 2011.
- The Flood Control Centre will mobilise during a flood event at North Pine, Somerset or Wivenhoe Dams. It operates 24 hours a day with teams of operators at each dam 24 hours a day managing releases.

HOT ISSUE BRIEFING NOTE

HOT ISSUE G.X	Wivenhoe Dam releases
Question	What is happening with the releases from Wivenhoe Dam?

Issue:

- Seqwater will now be extending the current release strategy for Wivenhoe Dam until close of business, Wednesday, 2 March 2011.
- By extending the timeframe of releases from Wivenhoe Dam, Twin Bridges, Savages Crossing and Colleges Crossing will be inundated for an additional 36 hours.

Answer:

- As of 9.00 am, Monday 28 February 2011, Wivenhoe Dam is 82.2 per cent of full supply level.
- Water releases to reduce Wivenhoe Dam to 75 per cent commenced Sunday 20 February 2011 at 6.00 am and was scheduled to continue for nine days.
- The release period of nine days has now been extended due to further rainfall and a reduction of release rates on Monday 21, February 2011.
- The 9 day release period to reduce Wivenhoe Dam to 75 per cent was always dependent on further rainfall across the dam and catchment as well as rainfall downstream.
- Storm activity across the Wivenhoe Dam catchment and Brisbane River catchment below the dam on Monday,

21 February 2011 impacted on the release strategy. Wivenhoe Dam release rates were reduced for a 24 hour period to allow flows down the Lockyer to sufficiently pass.

- In addition, Wivenhoe Dam has received inflows of up to 40,000 megalitres (or the equivalent of about four per cent capacity) from the surrounding catchment, with minor inflows continuing
- Seqwater estimates the inflows, combined with the need to reduce flow rates, has currently added at least 36 hours to the release strategy.
- The nine day release strategy was scheduled to be completed in the morning of Tuesday, 1 March 2011. By this stage, Seqwater estimates Wivenhoe Dam levels will between 79-80 per cent full supply level (depending on further inflows).
- The current full supply level of 82.2 per cent equates to a reduction of FSL of approximately 208,000 megalitres or 208 million litres of water.
- By continuing releases until close of business Wednesday, 2 March 2011, Seqwater estimates Wivenhoe Dam will be between 75-77 per cent of full supply level.
- The dam will be drawn down to as close as possible to 75% as possible and without releases coinciding with potential rainfall events and potential increased river flows downstream of Wivenhoe Dam.
- The current Bureau of Meteorology forecast is for 10-15 millimetres of rainfall until Thursday, 3 March 2011. Storm

activity is forecast from Friday, 4 March 2011 with 50-100 millimetres of rainfall forecast over the following four days until Tuesday, 8 March 2011.

- Based on the above forecast of storm activity and heavier rainfall by the end of the week, and after consultation with the Somerset Regional Council, Ipswich Regional Council and Brisbane City Council, Seqwater only intends to continue current releases until close of business, Wednesday, 2 March 2011 to allow bridges to open.

Future rainfall impacts until 31 March

- To maintain Wivenhoe Dam at around 75 per cent until 31 March, Seqwater may utilise a low release strategy of 50 cubic metres per second in the first instance if the further forecasted rainfall is received. This low release amount will allow Savages Crossing and Colleges Crossing to remain open
- The release amount is dependent on rainfall and subsequent inflows, and may be required to increase.

Reducing Wivenhoe Dam to 75 per cent

- Seqwater has recommended that the water level in Wivenhoe Dam be temporarily reduced to 75 per cent of full supply level.
- The release strategy to reduce Wivenhoe Dam to 75 per cent of its full supply level was aimed at creating an additional flood buffer zone for the rest of the wet season quickly and with as minimal impact on the community as possible.

- The reduction of Wivenhoe Dam will not impact on South East Queensland's water security because the Water Grid secures our water supply over the short, medium and long term.
- We expect that the water released will be recouped in the coming years.

Road closures

- Under the extended release strategy it is expected Twin Bridges and Savage's Crossing will no longer by inundated by Thursday, 3 March 2011 and College's Crossing no longer inundated by Friday, 4 March 2011.
- Local Councils are responsible for road closures as a result of spilling dams or controlled releases.

HOT ISSUE BRIEFING NOTE

HOT ISSUE G.X	SEQ Water Grid Dams
Question	What is happening with South East Queensland's Dams?

Issue:

- What dam gates are opened or will be today?
- What dams are spilling?

Answer:

Wivenhoe Dam

- A spillway gate at Wivenhoe Dam was opened just after 7pm on Saturday 9 October 2010.
- The gate was opened partially following a review of updated information from the Weather Bureau and monitoring of inflow data collated from the catchment.
- Wivenhoe Dam is still rising and Seqwater's Flood Control Centre will reassess the amount of water released today.
- Water is also being passed through the dam's hydro-electric generator for supply into the Grid. The remainder is contributing to environmental flows.

Somerset Dam

- The sluiceway and a cone valve were opened at Somerset Dam at approximately 10.00 pm on Saturday 9 October 2010.
- Water will continued to be released until the dam reaches full supply level.
- Released water from Somerset Dam flows into Wivenhoe and forms part of Wivenhoe Dam's controlled releases.

North Pine Dam

- Water is being released from North Pine Dam. Seqwater opened the gates at approximately 8 am today.
- Released water from the North Pine Dam is channelled into North Pine River, contributing to environmental flows.

Leslie Harrison Dam

- Leslie Harrison Dam in the Redlands area began controlled gate releases from 3.00am this morning.

Hinze Dam

- Seqwater is currently monitoring Hinze Dam, which is still under Stage 3 construction.
- It is likely that they will use the new emergency gates today when the dam reaches the trigger point to release water.
- Authority has been granted from DERM to operate controlled releases, to maintain the dam at the current full supply level.
- Released water from Hinze Dam will flow into Nerang River contributing to environmental flows.

Sunshine Coast dams

- All major dams on the Sunshine Coast are spilling. These dams are built with spillways rather than gates.
- Water spilling form the Sunshine Coast dams also flow into local waterways, contributing to environmental flows.

Road closures and safety

- Local Councils are responsible for road closures as a result of spilling dams or controlled releases.
- We recommend due to road safety that people avoid travel to dams and storages, particularly during the heavy weather and at night.

Flood Operations Centre

- Seqwater's Flood Operations Centre was activated over the weekend and will operate 24 hours a day.
- The Flood Operations Centre will continue to advise local and emergency authorities on potential impacts downstream as a result of the gated dam releases.

HOT ISSUE BRIEFING NOTE

HOT ISSUE G.X	SEQ Water Grid Dams
Question	What is happening with South East Queensland's Dams?

Issue:

- What dam gates are opened or will be today?
- What dams are spilling?

Answer:

Wivenhoe Dam

- A spillway gate at Wivenhoe Dam was opened just after 7pm on Saturday 9 October 2010.
- Approximately 23,000 megalitres per day is currently being released from Wivenhoe Dam's spillway gates.
- The gate was opened partially following a review of updated information from the Weather Bureau and monitoring of inflow data collated from the catchment.
- Wivenhoe Dam is still rising and Seqwater's Flood Control Centre will reassess the amount of water released today.
- Water is also being passed through the dam's hydro-electric generator for supply into the Grid. The remainder is contributing to environmental flows.

Somerset Dam

- The 4 gates and a cone valve were opened at Somerset Dam at approximately 10.00 pm on Saturday 9 October 2010.
- Water will continued to be released until the dam reaches full supply level.
- Released water from Somerset Dam flows into Wivenhoe and forms part of Wivenhoe Dam's controlled releases.

North Pine Dam

- Water is being released from North Pine Dam. Seqwater opened the gates at approximately 8 am today.
- Released water from the North Pine Dam is channelled into North Pine River, contributing to environmental flows.
- Closed later this afternoon or tomorrow morning

Leslie Harrison Dam

- Leslie Harrison Dam in the Redlands area began controlled gate releases from 3.00am Monday morning.
- The gates will be closed sometime today.

Hinze Dam

- Seqwater is currently monitoring Hinze Dam, which is still under Stage 3 construction.
- The new emergency gates were opened at 7.30am this morning when the dam reached the trigger point to release water.
- Authority has been granted from DERM to operate controlled releases, to maintain the dam at the current full supply level.
- Released water from Hinze Dam will flow into Nerang River contributing to environmental flows.

Sunshine Coast dams

- All Gold dams on the Sunshine Coast remain spilling and will do well into next week. These dams are built with spillways rather than gates.
- Water spilling form the Sunshine Coast dams also flow into local waterways, contributing to environmental flows.

Road closures and safety

- Local Councils are responsible for road closures as a result of spilling dams or controlled releases.
- We recommend due to road safety that people avoid travel to dams and storages, particularly during the heavy weather and at night.

Flood Operations Centre

- Seqwater's Flood Operations Centre was activated over the weekend and will operate 24 hours a day.
- The Flood Operations Centre will continue to advise local and emergency authorities on potential impacts downstream as a result of the gated dam releases.

HOT ISSUE BRIEFING NOTE

HOT ISSUE G.X	SEQ Water Grid Dams – as at 18 October 2010
Question	**What is happening with South East Queensland's Dams?**

Issue:

- What dam gates are closed?
- What dams are spilling?

Answer:

Wivenhoe Dam - Closed

- The spillway gates at Wivenhoe Dam commenced the closure sequence on Friday 15 October 2010, after being opened progressively on Saturday 9 October 2010 at 7.00pm.
- The final gate was closed at 9.00am Tuesday 19 October 2010. The closing sequence was designed to imitate the natural dropping of river levels while allowing for the opening of river crossings and recovery of stranded fish.
- Approximately 640,000 megalitres were released through Wivenhoe Dam's spillway gates, which includes Somerset Dam release amount, which is the equivalent of 262,000 olympic sized swimming pools or one Sydney Harbour.

Somerset Dam - Closed

- The 4 gates and a cone valve were opened at Somerset Dam at approximately 10.00 pm on Saturday 9 October 2010 and closed on Monday 18 October 2010.
- Approximately 277,000 megalitres were released through Somerset Dam's spillway gates and cone valve.
- Released water from Somerset Dam flows into Wivenhoe and forms part of Wivenhoe Dam's controlled releases.

North Pine Dam - Closed

- The spillway gates of North Pine Dam closed on Thursday 14 October 2010, after being open since Tuesday 12 October 2010.
- The gates were then opened on 16 October 2010 at 6.00am and closed at 4.00pm the same day.

- Approximately 61,500 megalitres were released through North Pine Dam's spillway gates.
- Released water from the North Pine Dam is channelled into North Pine River, contributing to environmental flows.

Leslie Harrison Dam - Closed

- The spillway gates of Leslie Harrison Dam in the Redlands area began controlled gate releases from 3.00am on 11 October 2010 and closed on the same day at 7.00 pm.
- The gates were then opened on 15 October 2010 at 8.30pm and closed on 16 October 2010 at 4.30pm.
- Approximately 4,700 megalitres were released through Leslie Harrison Dam's spillway gates.

Hinze Dam - Closed

- The new emergency gates were closed today 19 October 2010, after being opened on 12 October 2010 at 7.30am.
- Authority had been granted from DERM to operate controlled releases, to maintain the dam at the current full supply level.
- Released water from Hinze Dam flows into Nerang River contributing to environmental flows.

Sunshine Coast dams - Spilling

- All dams on the Sunshine Coast remain spilling. These dams are built with spillways rather than gates.

- Water spilling from the Sunshine Coast dams also flows into local waterways, contributing to environmental flows.

Road closures, flood safety and visitors

- Local Councils are responsible for road closures as a result of spilling dams or controlled releases.

- Approximately 60,000 residents visited Wivenhoe Dam during the spillway opening. We recommended due to road safety that people avoid travel to dams and storages, particularly during the heavy weather and at night.

Media

- The SEQ Water Grid Communications Unit fielded contact from various media in relation to storages across South East Queensland, including
    - Radio - 4BC, ABC Brisbane-Toowoomba-Gold Coast, Hot Tomato FM, Gold FM, 4ZZZ, Triple M, 4EB, 96.5 FM, River FM, B105, NOVA and QUT radio
    - Television – Channel 10 News, Channel 9 News and Today Show, Channel 7 News, WIN News, Weather Channel and ABC TV
    - Print – The Courier Mail, The Australian, Gold Coast Bulletin, Fassifern Guardian, Brisbane Times, Queensland Times, Inside QUT, Engineers Australia, The Toowoomba Chronicle, North West News, Somerset News, Brisbane Valley, Kilcoy Sun and Bayside Bulletin.

Fish Recovery

- Recovery of stranded fish from dam releases is underway.
- At Wivenhoe Dam, six (6) lungfish have been rescued as well as a number of other small fish of other species (3 other lungfish found dead). There are still some holes too deep for rescue work at this stage, so monitoring will continue this afternoon and tomorrow 20 October 2010.

Flood Operations Centre

- Seqwater's Flood Operations Centre was activated over the weekend of 9-10 October 2010 and operates 24 hours a day. The Flood Operations Centre demobilised this morning 19 October 2010.

- The Flood Operations Centre will continue to advise local and emergency authorities on potential impacts downstream as a result of the gated dam releases.

HOT ISSUE BRIEFING NOTE

HOT ISSUE G.X	Bulk Water Entities and the Commission of Inquiry
Question	What information are South East Queensland's bulk water entities providing to the Commission of Inquiry?

Issue:

- Actions of the Bulk Water Entities in relation to the Commission of Inquiry and provision of opening submissions (due today 11 March 2011).

Answer:

- Seqwater, SEQ Water Grid Manager, LinkWater and WaterSecure will be actively supporting the Commission and its endeavours wherever and whenever possible.
- Seqwater has been formally requested to provide data and documents related to the January flood event to the Commission of Inquiry.
- In addition to this request, Seqwater sought leave to appear before the Commission of Inquiry, which has been granted.
- As part of Seqwater's appearance before the Commission, two submissions will be provided;
  - a submission today, which will detail flood preparedness relevant to next summer's wet season
  - a submission by 4 April 2011, which will focus on addressing any other matters in the Inquiry's terms of reference.

- While no other Bulk Water Entities (WaterSecure, LinkWater and SEQ Water Grid Manager) have been requested to provide information, LinkWater and SEQ Water Grid Manager are proactively supplying a submission to the Commission today.
- The SEQ Water Grid Manager's submission will detail the roles and responsibilities of the organisation in the State's management of water supply in South East Queensland.
- LinkWater's submission covers flood preparedness for the 2011-12 summer with a further submission by 4 April 2011, which will focus on the longer term issues around flooding in South East Queensland.

HOT ISSUE BRIEFING NOTE

HOT ISSUE G.X	**Wivenhoe Dam levels**
Question	Why and the likelihood of Wivenhoe spilling and the operational risks and safety advice.

Issue:

Will Wivenhoe Dam spill? How are we prepared?

Answer:

Current dam levels

Wivenhoe Dam has reached 100 per cent for the first time since 2001.

Somerset Dam is full, with water being released in Wivenhoe Dam via the cone valves.

Across the Water Grid, key storages are at 98.5% of storage capacity, up from 95.8% last week.

Will the gates be opened?

It is likely that Seqwater will undertake controlled releases from Wivenhoe Dam via the cone valves in the bottom of the dam wall from Monday next week.

The gates will only be opened if the catchment area receives further substantial rainfall.

(Cone valves are structures built towards the bottom of a dam wall to allow for smaller controlled releases of water. Flood gates are large structures built into a dam wall allowing a maximum release of flood waters as required to maintain the integrity of the dam wall.)

Are we prepared for flood?

Wivenhoe has enormous flood capacity – almost the equivalent of three times Sydney Harbour (1.45 million megalitres). Put in context Wivenhoe has received 376,000 megalitres in flows for the year to date.

Seqwater has a Dam Safety Management Program to ensure that each of its dams is operated and maintained in a manner that is both safe and minimises the risks associated with a dam failure and managing flood events, including by working with local councils and emergency services.

The program has been endorsed and approved by the Dam Safety Regulator and met the standards required by the Queensland Dam Safety Management Guidelines and the international ANCOLD Guidelines on Dam Safety Management

The Flood Control Centre will mobilise during a flood event at North Pine, Somerset or Wivenhoe Dams. It operates 24 hours a day with teams of operators at each dam 24 hours a day managing releases.

Seqwater has an extensive monitoring network of 140 gauging stations across the catchment that monitors rainfall, streamflow and dam levels.

The $395 Hinze Dam upgrade is on track to be completed for the coming wet season, delivering improved flood protection for 3280 households on the Gold Coast.

Benefits of the Grid

The Grid enables us to choose the water use – meaning that it is the most secure water supply in Australia, in drought and when the dams are full.

Heavy rain often causes water quality issues. It drags nutrients and other compounds from the catchments into our water supplies.

With the Grid, we are better prepared for these events than ever before. We can isolate, or blend water from multiples sources.

We have already used the Grid on multiple times to minimise the impact of water quality issues.

- In March 2010, desalinated water was used in response to a taste and odour issue arising from Hinze Dam.
- On previous occasions, we transported desalinated water up the Southern Regional Water Pipeline to blend with water from the Mt Crosby water treatment plant. As a result, the peak concentrations of taste and odour compounds were significantly reduced.

Water Conservation measures

The Permanent Water Conservation Measures that were introduced on 1 December 2009 are aimed at maintain good water practices for the future.

The recently released *South East Queensland Water Strategy* shows that maintaining our consumption below 200 litres per person per day will defer the need for additional water supply infrastructure in all scenarios by at least five years.

Permanent Water Conservation Measures are low level requirements that recognise the value of water.

- Residents are able to hose their gardens, fill a play pool or wash a car.
- Gardens can be irrigated with efficient irrigation systems between 4.00 pm and 10.00 am on any day of the week, except Mondays.

- Residents are able to use a hand held hose or high pressure cleaning unit to clean cars, boats, caravans and residential buildings at any time.
- Residents can also fill or top up a play pool for children at a maximum of 500 litres.

Water Security

SEQ now has the most secure water supply in Australia, underpinning our lifestyle and economic prosperity.

However, having been so close to catastrophe before, we cannot leave our water security to chance.

Just remember, less than three years ago our dams were at less than 17% of capacity.

Desalination

The plant has resumed supply. It has already supplied more than 28 billion litres into the SEQ Water Grid, since February 2009.

The desalination facility underpins water security for South East Queensland. It will ensure that we can respond to population growth, future droughts, climate change and heavy weather.

The plant is a key part of the SEQ Water Grid's emergency response plan, supplying up to 20% of our current demand. It has already been used on multiple occasions to reduce taste and odour issues on the Gold Coast and in Brisbane.

The plant also provides the flexibility to quickly match production to demand, should other Grid assets becomes unavailable. For example, production could be increased if a water treatment plant is temporarily

shut-down for maintenance or if a major asset fails, such as occurred in May 2009 when a pipeline from Mt Crosby broke.

The desalination facility will be run as efficiently as possible, like all assets within the Water Grid. We will save money and electricity by operating at one-third of capacity. At this rate, the operating costs are only 2.5% of the total costs of the Water Grid.

Wivenhoe Dam operating level

Investigations have commenced into the extent to which the full supply level of Wivenhoe Dam could be raised, without raising the dam wall, while maintaining acceptable risk levels at the dam itself and inundated areas.

We will not take risks with flood safety.

The investigation will involve detailed investigations associated with upstream and downstream flooding, environmental considerations, impacts on infrastructure and lease resumptions.

Until the raising of the full supply level is fully assessed, flood waters will be cleared to the existing full supply level in accordance with the existing Flood Operations Manual developed by Seqwater and approved by the Dam Safety Regulator to ensure public safety is maintained.

HOT ISSUE BRIEFING NOTE

HOT ISSUE G.X	General – Gold Coast Mayoral site visit to Hinze Dam
Question	Will there be any issues with Ron Clarke visiting Hinze Dam on 1 February 2011

Issue:

- A site tour of Hinze Dam, arranged by Darren Stewart, the Gold Coast City Council representative on the Hinze Dam Alliance Leadership Group (ALG), will include Gold Coast Mayor Ron Clarke.
- The site tour is set to take place on the morning of Tuesday 1 February 2011.

Answer:

- The Gold Coast Mayoral site tour of Hinze Dam Stage 3 upgrade will not include media or other councillors.
- The Hinze Dam Stage Three upgrade was originally a Gold City Council initiative to increase the provision of flood mitigation for the Gold Coast area.
- There is an amount of work to complete Hinze Dam Stage 3, including finalising the completion of the main embankment, which is expected to be completed towards the end of February, but is weather dependant.
- Some general site infrastructure, including roads and the interpretive centre may not be complete until March.
- Whilst Stage 3 is not complete, the Dam Safety Regulator has signed off on 'first fill', so the dam now meets the three regulatory

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- Some general site infrastructure, including roads and the interpretive centre may not be complete until March.
- Whilst Stage 3 is not complete, the Dam Safety Regulator has signed off on 'first fill', so the dam now meets the three regulatory

compliance targets of flood mitigation, increased storage and increased yield.

- A senior Seqwater person will be attending the Mayoral site tour.

John Adcock

From: Dan Spiller
Sent: Monday, 27 December 2010 10:37 AM
To: [redacted]; Lance McCallum [redacted]); Tim Watts [redacted]
Geoff Stead ([redacted]
Debbie Best [redacted]
Cc: SEQWGM Media; [redacted] Rob Drury [redacted]
Damien Brown ([redacted]
Subject: Water Grid technical and media update: 27/12
Attachments: Technical Stuation Report W22.docx

All,

Updated Seqwater technical report attached.

Key points are:

- Above 50mm of rainfall in dam catchments over past 24 hours
- Wivenhoe and Somerset Dam reached 106% of combined capacity despite a single gate being opened yesterday morning
- The other four gates will be opened tonight or early tomorrow in order to empty the flood compartment. The release rate will be similar to the peak last week and in October
- Burtons Bridge will be inundated, initially due to Lockyer Valley flows. We are seeking to ensure that Council notifies residents who will be isolated - as per Councils agreement with us on Friday - and to delay closure until at least mid afternoon
- The increased releases will not reach Brisbane until Wednesday. By that time, peak tides will be at least 0.5 metres lower than last week. For comparison, dam releases contributed about 0.2 metres to peak river levels last week. Other factors impact on river levels and local flooding, including local rainfall
- Releases are also being made from North Pine, Hinze and Leslie Harrison dams, with some local impacts

Draft Water Grid media update for today is below. This will be issued in the next half hour.

Regards,
Dan

[redacted] December 2010

Flood safety for South East Queensland over holiday season

Rainfall has resulted in increased releases from Water Grid dams.

About 50mm of rainfall has been recorded in the dam catchments over the past 24 hours.

Wivenhoe and Somerset dams have increased to 106% of combined capacity, despite continuing minor releases.

At Wivenhoe Dam, one of five gates was opened at 9am on Boxing Day. The remaining four gates will be opened late this afternoon or early tomorrow morning.

The gates are expected to remain open until at least Thursday, depending upon inflows.

With further rain forecast over coming days, it is important that the flood compartment be emptied.

Burtons Bridge is expected to be closed, with the status of other local bridges remaining unchanged.

Somerset Dam is now releasing approximately 12,000 megalitres per day into Wivenhoe Dam, with valves expected remain open until mid-week.

At North Pine Dam, a release commenced around 8pm last night and is expected to continue until at least early tomorrow morning. Youngs Crossing is inundated.

Releases from Hinze Dam also commenced last night. Weedons Crossing was inundated prior to the gate release.

A gate release is also continuing from Leslie Harrison Dam, but is expected to cease later on 27 December.

For recorded information on current dam releases in South East Queensland, members of the public are encouraged to call **1 800 613 122.**

Members of the public seeking information on local flooding impacts, including road closures, should contact the local council.

Recreation update

Both Wivenhoe and Somerset Dams are currently open for water-based recreation activities, however this may change at short notice depending on weather.

Billies Bay and river access at Atkinsons Crossing at Wivenhoe Dam remain closed.

All other recreational sites have reopened however this status may change at short notice depending on the weather.

While some low-lying camp grounds at Wivenhoe have been inundated due to rain, most camping facilities are open, though some are fully booked.

If further heavy rain occurs, it may be necessary for some camping grounds to close.

Please contact the operators of the various camping grounds for information regarding each site.

For further information on the Water Grid: www.watergrid.com.au

ENDS

John Adcock

From: Dan Spiller
Sent: Wednesday, 29 December 2010 8:29 AM
To: [redacted]
Cc: 'Rob Drury'; '[redacted]u'; SEQWGM Media; [redacted]
[redacted]u'
Subject: Water Grid technical report: 29/12
Attachments: Technical Stuation Report W24.docx

All,

Attached is the updated technical report. Key points are:

- Very little rainfall in the catchments over the past day
- Lockyer flows peaked around midday yesterday
- Increases from Wivenhoe Dam are now increasing, with all five gates now open to varying degrees. From later today, the release rate will be similar to during the October and early December events
- Releases will continue until the end of the week, with total releases in the order of 385,000 ML.

Hinze Dam will also continue releases until the end of the week. North Pine and Leslie Harrison dams have ceased releases.

Somerset Dam has been reopened to on-water activities. Wivenhoe Dam and some recreation facilities remain closed.

We are coordinating today's media update with Lauren Sims.

Please call me on [redacted] if you require any further information.

Regards,
Dan

TECHNICAL SITUATION REPORT

TSR Number	W24	Date of TSR release	29.12.2010	Time of TSR release	7.00am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Drain flood compartment as quickly as possible (by about Sunday) without impacting Mt Crosby or Fernvale bridges.	
Strategy	• Continue increasing releases from current release as Lockyer drops up to maximum of 1500cumecs. • Twin Bridges, Savages, Burtons, Kholo and Colleges will be inundated until Sunday.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Ongoing inflows plus yesterdays rain
	Rainfall:	
	Lockyer/Bremer:	Flows beginning to decrease
	Brisbane River:	Releases increasing from yesterday, other inflows downstream dropping away rapidly so releases will not impact on Brisbane River downstream. As per BoM advice, impact on tides minimal.

Rainfall

No rainfall has fallen in the past 12 hours to 0600 Wednesday with the exception of 2-4 mm in the upper Somerset Dam catchment.
The rainfall forecast issued by BOM at 1600 Tuesday indicated only 3-5 mm in the Somerset and Wivenhoe catchments and 5-10mm in the North Pine catchment for the next 24 hours. The current BOM forecast for SE Qld over the next few days is mostly fine with a few showers

However, catchments remain saturated and are primed for additional runoff in the event of rain.

Somerset Dam

A flood release through the regulator cone valves at the dam commenced at 0900 on Sunday 26 December 2010. Early Tuesday the regulators were closed and sluices progressively opened throughout the day. At 1800 Tuesday 2 sluices were open, releasing about 35,000 ML/day into Wivenhoe. A further two sluice gates where opened overnight in an attempt to bring the lake level down to 99.75 to enable recreational use of Somerset water activities to resume on Wednesday. At 1800, the lake level was 99.83m AHD and falling slowly. Two sluice gates will be closed by 12:00 29/12/2010 and two sluice gates are expected to remain open until Thursday and will be closed when the lake returns to the full supply level of 99m AHD. The total volume of water released since the event commenced on 26 December 2010 is 66,000ML, with the current projected total release volume for this event approaching 110,000ML (includes inflows still coming in).

Currently Somerset is at around 110% with 36,000ML above FSL.

Wivenhoe Dam

Radial gate operations for the current event commenced at 0900 on Sunday 26 December 2010. After scaling up to an initial release rate of 30,000ML/day, the release was scaled back Monday to the minimum radial gate release rate of 4,000ML/day to ensure that Burtons Bridge remained open and to reduce flooding impacts in the Brisbane River caused by flows from Lockyer Creek. Lockyer Ck outflow peaked at midday Tuesday and Wivenhoe gates were commenced to be re-opened at 1500 Tuesday, releasing on the back of the Lockyer recession. It is intended to gradually increase the Wivenhoe releases during Tuesday and Wednesday so that the combined release and Lockyer flow is maintained at about 1600m3/s (140,000 ML/day) in the mid Brisbane R. Note this is similar to the flows in the mid Brisbane in mid October and mid December 2010. This will be maintained until at least Saturday when it is expected that shut down procedure will commence. Gate closure sequencing will be such that the releases will mimic the natural pre-dam flows.

At 0600, the Wivenhoe water level was 69.26m AHD and rising slowly with the current release rate at 60,000ML/day. Inflows into the dam are subsiding and the lake will fall slowly once the release rate is scaled up 130,000 ML/day during Wednesday. It is aimed to return the dam to full supply level by Sunday. The total volume of water released since the event commenced on 26 December 2010 is 56,000ML, with the current projected total release volume for this event being in the order of 385,000ML (includes inflows from Somerset Dam).

Currently Wivenhoe is at 122.3% about 260,000ML above FSL.

Impacts of Wivenhoe Dam Releases

Twin Bridges, Savages Crossing, Colleges Crossing, Burtons Bridge and Kholo Bridge are currently closed and will remain so until at least Sunday. There is no current expectation that either Mt Crosby Weir Bridge or Fernvale Bridge will be impacted by the current event. At this stage, it is estimated that the flow at Burtons Bridge will fall below the bridge deck on Sunday morning.

Wivenhoe releases should have minimal impact on tides based on planned releases. BoM advice confirmed this. Impacts from Bremer and other inflows should have mostly passed by the time any release from Wivenhoe gets to downstream river reaches.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Worning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	

BoM Technical Officer contact details	[redacted]

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	30.12.2010	**Time**		**or Event**	

Dan Spiller
Thursday, 30 December 2010 7:40 AM

To: [redacted]

Cc: [redacted] SEQWGM Media; [redacted]

Subject: Water Grid gate releases technical report: 30/12
Attachments: Technical Stuation Report W25.docx

All,

Attached is the updated technical report regarding gate releases. Key points are:

- All gates at Wivenhoe Dam are open, releasing at about 130,000 ML/day (about 140,000 ML/day with Lockyer Valley flows). This is similar to the peak release rate in October and early December
- Shutdown will commence Friday and be complete by Sunday, without further rainfall
- Local bridges and crossings likely to continue to be inundated until Sunday
- Downstream river levels continue to reduce with tides and reduced local flows.

Releases from North Pine and Leslie Harrison dams have ceased, pending any further rainfall. Hinze Dam releases will continue until the weekend.

Separately, extremely poor water quality in the Brisbane River caused operational issues for the Mt Crosby WTP yesterday. The WTP was back online by mid afternoon at reduced output. A number of other operational changes have been made, including operating the desalination facility and Southern Regional Water Pipeline at capacity. I will provide an update on these issues after 9.30am and continue to report as necessary.

Please call me on [redacted] if you require any further information.

Regards,
Dan

TECHNICAL SITUATION REPORT

TSR Number	W25	Date of TSR release	30.12.2010	Time of TSR release	7.00am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Drain flood compartment as quickly as possible (by about Sunday) without impacting Mt Crosby or Fernvale bridges.	
Strategy	• Continue current releases of around 1500cumecs. • Twin Bridges, Savages, Burtons, Kholo and Colleges will be inundated until Sunday.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Ongoing inflows
	Rainfall:	
	Lockyer/Bremer:	Flows continue to decrease
	Brisbane River:	Releases increased from yesterday, other inflows downstream dropping away rapidly so releases will not impact on Brisbane River downstream. As per BoM advice, impact on tides minimal.

Rainfall

There has been no significant rainfall in the North Pine, Somerset and Wivenhoe catchments since 09:00 on Wednesday 29 December 2010. The current BOM forecast for SE Qld over the next few days is mostly fine with a few light showers, although there is a chance of storms on Tuesday and Wednesday next week.

The catchments remain saturated and are primed for additional runoff in the event of rain.

Somerset Dam

At 06:00 Thursday 30 December 2010, two sluices remain open, releasing about 35,000 ML/d into Lake Wivenhoe and are expected to remain open until Thursday afternoon when the lake returns to the full supply level of 99.00m AHD. The total volume of water released since the event commenced on 26 December 2010 is 104,000ML, with the current projected total release volume for this event approaching 123,000ML.

Wivenhoe Dam

Releases were gradually increased during Wednesday and Thursday morning until the combined release and Lockyer flow reached about 1,600m3/s (140,000 ML/d) in the middle Brisbane River. (Note this is similar to the flows in the releases made in mid-October and earlier in December 2010). This release will be maintained until mid-day Friday 31 December 2010, when the shut down procedure will commence and gates are expected to be fully closed by Sunday morning 2 January 2010. The proposed gate closure sequence will be such that the releases will mimic the natural pre-dam

recessional flows.

Gauge board readings indicate that the Wivenhoe dam water level peaked at 69.33m at noon Wednesday 29 December 2010, about 2.3m above the full supply level. At this level, the dam was temporarily storing over 270,000ML of flood water. At 06:00 on Thursday 30 December 2010, the level had fallen slightly to 69.07m AHD and was releasing about 1,530m3/s (132,000ML/d). The total volume of water released from Wivenhoe dam since the event commenced on 26 December 2010 is 160,000ML, with the current projected total release volume for this event being in the order of 425,000ML (includes inflows from Somerset Dam).

Impacts of Wivenhoe Dam Releases

Twin Bridges, Savages Crossing, Colleges Crossing, Burtons Bridge and Kholo Bridge are currently closed due to inundation and will remain so until at least Sunday 2 January 2011. There is no current expectation that either Mt Crosby Weir Bridge or Fernvale Bridge will be impacted by this event. At this stage, it is estimated that the flow at Burtons Bridge will fall below the bridge deck on Sunday morning.

Wivenhoe releases should have minimal impact on tides based on planned releases. BoM advice confirmed this earlier in the week. Impacts from Bremer and other inflows should have mostly passed by the time any release from Wivenhoe gets to downstream river reaches.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	[redacted]

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	[redacted]

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**		**Time**		**or Event**	Closing sequence or change in strategy

John Adcock

From: Dan Spiller
Sent: Thursday, 30 December 2010 10:08 AM
To: [redacted]
Cc: [redacted]; SEQWGM Media; [redacted]
Subject: RE: Water Grid gate releases technical report: 30/12

All,

Water Grid operations are now stable.

With the Mt Crosby WTP offline, key reservoirs in Brisbane and the Gold Coast were drawn down to low levels. Reservoirs in northern Brisbane and on the Gold Coast are now full. Some key reservoirs in south Brisbane remain at about 30% of capacity, and are only increasing slowly.

Key actions over the next 24 hours will be to:

- Increase storage in the south Brisbane reservoirs back to target levels
- Bring the second of the two Mt Crosby WTPs back on line. This is expected to take another 24 hours. About 20 ML of poor quality treated water is being discharged today (diluted by about 130,000 ML of releases from Wivenhoe Dam). The second WTP is not required to meet demand, but provides resilience to the Grid should problems emerge elsewhere.

With those actions, supply will be secure. From that time, we will focus on monitoring water quality - with the potential for increased taste and odour issues. In terms of water quality, QUU has advised that it did not receive any customer complaints from 24/12 to yesterday (when it compiled results).

The desalination facility has had a key role in the response to this water quality incident:

- The plant has been operating at full capacity since yesterday, and will continue to do so until this afternoon
- Production at capacity has enabled us to fill the Gold Coast reservoirs while also transferring water north at the capacity of the Southern Regional Water Pipeline
- From this afternoon, we will throttle back to two-thirds capacity and maintain that level of output until at least next week
- Ongoing operation at two-thirds capacity will enable us to reduce demand on the Mt Crosby and Molendinar WTPs, which have some water quality taste and odour issues. We can also blend with dam water
- This type of operation was envisaged in the recommendation to move to standby mode. We had two standby trials before Christmas, with a permanent move planned from mid January. We were very pleased by how quickly the facility was returned to full capacity yesterday.

Elsewhere, we are seeking to bring the Capalaba WTP back online today. This has been complicated by the water quality in the dam degrading overnight. However, the plant is not essential - with the area currently being supplied from NSI. Trial water will be discharged.

Please call me on [redacted] if you have any queries or require any further information.

Regards,
Dan

From: Dan Spiller
Sent: Thursday, December 30, 2010 7:40 AM
To: [redacted];
[redacted];
[redacted];
[redacted]
Cc: [redacted]; SEQWGM Media; [redacted];
[redacted]
Subject: Water Grid gate releases technical report: 30/12

All,

Attached is the updated technical report regarding gate releases. Key points are:

- All gates at Wivenhoe Dam are open, releasing at about 130,000 ML/day (about 140,000 ML/day with Lockyer Valley flows). This is similar to the peak release rate in October and early December
- Shutdown will commence Friday and be complete by Sunday, without further rainfall
- Local bridges and crossings likely to continue to be inundated until Sunday
- Downstream river levels continue to reduce with tides and reduced local flows.

Releases from North Pine and Leslie Harrison dams have ceased, pending any further rainfall. Hinze Dam releases will continue until the weekend.

Separately, extremely poor water quality in the Brisbane River caused operational issues for the Mt Crosby WTP yesterday. The WTP was back online by mid afternoon at reduced output. A number of other operational changes have been made, including operating the desalination facility and Southern Regional Water Pipeline at capacity. I will provide an update on these issues after 9.30am and continue to report as necessary.

Please call me on [redacted] if you require any further information.

Regards,
Dan

John Adcock

From: Dan Spiller
Sent: Friday, 31 December 2010 7:50 AM
To: [redacted]; Lance McCallum [redacted]); Tim Watts [redacted]
Geoff Stead ([redacted]
Ken Smith [redacted] Debbie Best [redacted]
([redacted]
Cc: [redacted]; Rob Drury [redacted] SEQWGM Media; Damien Brown [redacted]
Madgwick.DarrenT@police.qld.gov.au
Subject: Water Grid gate releases: 31/12
Attachments: Technical Stuation Report W26.docx

All,

Attached is todays technical situation report for releases from Wivenhoe Dam. Key points are:

- About 130,000 ML/day is currently being released, through all five gates
- Gates will begin closing from late tonight or early tomorrow. Final closure is planned for Sunday
- Total releases for this release will be about 450,000 ML.

Hinze Dam will continue releases until next week. Leslie Harrison and North Pine dams have ceased releases.

Unless there is a change to the operating plan, we will provide the next report on Sunday once Wivenhoe Dam gates are closed.

I will provide a seperate report about Water Grid operations after a 9am teleconference.

Please call me if you have any queries.

Regards,
Dan Spiller

TECHNICAL SITUATION REPORT

TSR Number	W26	Date of TSR release	31.12.2010	Time of TSR release	7.00am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Drain flood compartment as quickly as possible (by about Sunday) without impacting Mt Crosby or Fernvale bridges.	
Strategy	• Continue current releases of around 1500cumecs. • Twin Bridges, Savages, Burtons, Kholo and Colleges will be inundated until Sunday.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Ongoing inflows
	Rainfall:	
	Lockyer/Bremer:	Flows continue to decrease
	Brisbane River:	Releases not changing greatly, other inflows downstream dropping away rapidly so releases will not impact on Brisbane River downstream. As per BoM advice, impact on tides minimal.

Rainfall

There has been no significant rainfall in the North Pine, Somerset and Wivenhoe catchments since 0900 on Wednesday 29 December 2010. The current BOM forecast for SE Qld over the next few days is mostly fine with a few light showers, although there is a chance of storms on Tuesday and Wednesday next week.

The catchments remain wet and are likely to generate additional runoff in the event of rain.

Somerset Dam

At 0500 on Friday 31 December 2010, the lake level was 99.01m AHD falling from a peak of 100.0m AHD reached around noon Tuesday 28 December 2010. Two regulators are currently operating and will remain open until the lake returns to the full supply level of 99.00m AHD. The total volume of water released since the event commenced on 26 December 2010 is 126,000 ML, with the current projected total release volume for this event approaching 130,000ML.

Wivenhoe Dam

Releases were gradually increased during Wednesday and Thursday morning until the combined release and Lockyer flow reached about 1,600m3/s (140,000 ML/d) in the middle Brisbane River. (Note this is similar to the flows in the releases made in mid-October and earlier in December 2010). Flow measurement carried out by the Department of Environment and Heritage during Thursday has confirmed this flow. This release will be maintained until late Friday 31 December 2010, when the shut down procedure will commence and gates are expected to be fully closed by Sunday 2 January 2010.

The proposed gate closure sequence will be such that the releases will mimic the natural pre-dam recessional flows.

At 0500 on Friday 31 December 2010, the level had fallen slightly to 68.40m AHD and was releasing about 1,550m3/s (132,000ML/d). The total volume of water released from Wivenhoe dam since the event commenced on 26 December 2010 is 293,000ML, with the current projected total release volume for this event being in the order of 450,000ML (includes inflows from Somerset Dam).

Impacts of Wivenhoe Dam Releases

Twin Bridges, Savages Crossing, Colleges Crossing, Burtons Bridge and Kholo Bridge are currently closed due to inundation and will remain so until at least Sunday 2 January 2011. There is no current expectation that either Mt Crosby Weir Bridge or Fernvale Bridge will be impacted by this event. At this stage, it is estimated that the flow at Burtons Bridge will fall below the bridge deck on Sunday morning.

Wivenhoe releases should have minimal impact on tides based on planned releases. BoM advice confirmed this earlier in the week. Impacts from Bremer and other inflows should have mostly passed by the time any release from Wivenhoe gets to downstream river reaches.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	[redacted]

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**		**Time**		**or Event**	Final closing of gates

John Adcock

From: Dan Spiller
Sent: Friday, 31 December 2010 9:47 AM
To: [redacted]; Lance McCallum [redacted]); Tim Watts [redacted] Geoff Stead [redacted] Ken Smith [redacted]; Debbie Best [redacted]
Cc: [redacted]; Rob Drury [redacted]); SEQWGM Media; Damien Brown [redacted];
Subject: Water Grid operational update

All,

Operation of the Water Grid is now stable, and reservoir levels are recovering.

The second of the two Mt Crosby WTPs is expected to be operational by midnight tonight, from which time supply from North Pine WTP and the Southern Regional Water Pipeline will be reduced.

All reservoirs on the Gold Coast are now full, meaning that production from the desalination facility has been reduced to one-third. The desalination facility remains at a high level of readiness, should there be further issues.

Please contact me on [redacted] should you require any further information.

Dan

From: Dan Spiller
Sent: Friday, 31 December 2010 7:49 AM
To: [redacted]; Lance McCallum [redacted]); Tim Watts [redacted]; Geoff Stead [redacted]); [redacted]; Ken Smith [redacted]); Debbie Best [redacted]; Rob Drury [redacted]); SEQWGM Media; Damien Brown [redacted]); [redacted]; [redacted]
Subject: Water Grid gate releases: 31/12

All,

Attached is todays technical situation report for releases from Wivenhoe Dam. Key points are:

- About 130,000 ML/day is currently being released, through all five gates
- Gates will begin closing from late tonight or early tomorrow. Final closure is planned for Sunday
- Total releases for this release will be about 450,000 ML.

Hinze Dam will continue releases until next week. Leslie Harrison and North Pine dams have ceased releases.

Unless there is a change to the operating plan, we will provide the next report on Sunday once Wivenhoe Dam gates are closed.

I will provide a seperate report about Water Grid operations after a 9am teleconference.

Please call me if you have any queries.

Regards,
Dan Spiller

Gina O'Driscoll

From: Barry Dennien
Sent: Monday, 10 January 2011 11:46 AM
To: Lance McCallum [redacted]
Subject: FW: Wivenhoe Dam release strategy
Attachments: Technical Situation Report W37.docx

Importance: High

Lance

As discussed

Barry

Dear CEOs

This teleconference at 12.30pm today is to update you on the current Wivenhoe flood release strategy.

In preparation for this meeting we are intending to send out a Technical Report closer to 12.30pm that will detail the strategy.

Dial in details are:
Phone: [redacted]
Pin: [redacted]

If you wish to contact me regarding this teleconference, please phone my office on [redacted] or mobile [redacted].

Carl and Rob,

Attached is the Technical Situation Report drafted by Seqwater following consultation with BoM and Councils.

Key points are:

- There is continuing heavy rainfall in catchments. Total inflows over the event will be at least 1,500,000 ML and probably above 2,100,000 ML.
- As a result, Wivenhoe Dam is above 140% of capacity and Somerset is above 150%, with both rising fast.
- As specified in the approved Operational Procedures, the primary objective is now to minimizing the risk of urban inundation (release strategy W2). This involves larger releases now, minimizing the risk of even larger releases later (were the flood compartment to reach high levels).
- Consistent with this release strategy, dam releases have increased to 2,000 cubic metres per second (172,000 ML/day). It is expected to increase to 2,600 cubic metres per second by midday tomorrow.
- As specified in the approved Operational Manual, we are targeting maximum flow in the Brisbane River of 3,500 cumecs at Moggill. This is the levels above which urban inundation begins.
- For comparison, flows would be up to 12,000 cumecs without the dams.

Seqwater has previously had verbal conversations with Council staff regarding impacts. However, given the significance of this event, and consistent with the draft protocol, we are seeking formal Council input to this version. This advice would relate to the impact of releases, based on the type of scenario analysis that you described this morning.

Our preference would be to finalise the report, including your input, before or at the 12.30 teleconference with Council CEOs and the BoM. This timing means that it can underpin all media messaging this afternoon.

I appreciate your assistance. Please call me if I can be of any assistance.

Regards,
Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
Phone: [redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

TECHNICAL SITUATION REPORT

TSR Number	W36	Date of TSR release	10.1.2011	Time of TSR release	8am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Continue increasing releases to discharge flood waters but keep impact downstream to minimum.	
Strategy	• All bridges are now inundated .	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected around 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Moderate to heavy rainfall has been recorded in the Upper Brisbane and Stanley Rivers in the last 12 hours with totals up to 90 mm. Totals for the last 24 hours range from 100 to 325mm.

Mt Glorious recorded 100 mm in the last 12 hours.

Rainfall of similar magnitudes is expected in the 12 to 24 hours around the downstream catchments as the system tracks south.

A severe weather warning remains current for heavy rainfall in the dam catchment areas.

North Pine Dam (Full Supply Level 39.60 m AHD)

The dam level was 39.97 m and steady. Five gates are open releasing 475 m3/s. The inflow into the dam since the commencement of the event is 52,000 ML. Estimated event volume is 72,000 ML assuming no further rainfall. Gate operations will continue until at least Tuesday 11 January 2011.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level at 05:00 was 102.84 m AHD and rising (storing 193,000 ML above FSL) Peak inflow to the dam is estimated to be about 4,200 m3/s based on observed rainfall and could be as high as 5,000m3/s with additional forecast rainfall. Five sluice gates are open releasing about 1,100m3/s (95,000Ml/d) into Wivenhoe Dam. At this stage the dam lake level will reach about 103.5 mAHD on Monday afternoon. Areas around Kilcoy will continue to be adversely affected.

Since the commencement of the event on 02/01/2011approximately 142,000ML has been released from the dam into Wivenhoe, with an event total of the order of 520,000ML expected. This is expected to increase due to the forecast rain in the next 24 to 48 hours. At this stage, releases will continue until at least Thursday.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

River levels upstream of the dam have peaked and are falling slowly with significant inflow being generated from the intense heavy rainfall. Flows in the Brisbane River at Gregor's Ck have peaked at 7,350m3/s at 23:00 on Sunday 9 January. This peak is bigger than January 1974 and February 1999 at this location.

The dam level is rising quickly, with the current level being 70.77m AHD (storing 450,000 ML). Estimated peak inflow to the dam just from the Upper Brisbane R is around 8,800m3/s and, at this stage, the dam will reach at least 73.3 m AHD during Tuesday morning. Given the rapid increase in inflow volumes, it was necessary to start to increase the release from Wivenhoe during Monday morning.

The objective for dam operations will be to minimise the impact of urban flooding in areas downstream of the dam and, at this stage, the aim is to keep combined flows in the lower Brisbane to 3,500m3/sec if possible. Consistent with the approved Operating Procedures, these target combined flows may need to be increased to 4,000m3/s, and potentially higher. In either case, this is significantly less than the current estimated combined pre-dam peak inflow of 12,000 m3/s.

Fernvale Bridge approaches and Mt Crosby Weir Bridge have been inundated and both bridges are now closed.

The current release rate from Wivenhoe Dam is around 2,000m3/s (172,000ML/day). Gate opening will continue to be increased during Monday and the release is expected to increase to at least 2,600m3/s in the next 12 to 24 hours and further depending on downstream flows..

Since the commencement of the event on 02/01/2011 approximately 275,000ML has been released from the dam, with an event total approaching 1,600,000ML without further rain and as much as 2,100,000ML with forecast rainfall of (both including Somerset outflow). At this stage, releases will continue until at least Sunday 16th January 2011.

Impacts downstream of Wivenhoe Dam

The projected Wivenhoe Dam releases combined with Lockyer flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Fernvale, Savages Crossing, Burtons Bridge, Kholo Bridge, Mt Crosby Weir and Colleges Crossing) will be adversely impacted until at least Saturday 15 January in varying degrees.

Water levels in the lower Brisbane R will be impacted by the combined flows of Lockyer Ck, Bremer River, local runoff and releases from Wivenhoe Dam. If the predicted rainfall eventuates in the downstream tributary catchments the resultant combined flows in the lower Brisbane may exceed the threshold of damaging discharge in the urban areas within the next 24 to 48 hours. Currently the estimate peak flow in the lower Brisbane River will be the highest since Wivenhoe Dam was completed in 1984 but still well below flows the 1974 levels

Somerset Regional, Ipswich City and Brisbane City Councils have been advised of the updated Wivenhoe operating strategy.

Outlook

Heavy rainfall continues throughout South East Queensland and the situation could deteriorate rapidly over the next 24 hours. The flood operation centre will continue to monitor the situation and provide every six hours until the situation stabilizes.

Seqwater Technical Officer name	Robert Drury

Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	[redacted]

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River ond other relevant Bureau forecasts and warnings (e.g. weather/rain farecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	[redacted]

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator

SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	11.1.2011	Time		or Event	Change in strategy

Gina O'Driscoll

From: Water Grid Emergency Manager [redacted]
Sent: Monday, 24 January 2011 12:34 PM
To: Barry Dennien
Subject: SEQ Water Grid incident briefing
Attachments: MIN - Water Grid Emergency Update.pdf

Colleagues

Please find attached an update on current Water Grid Emergencies.

Regards

Water Grid Emergency Management Team
SEQ Water Grid Manager

Phone: [redacted]
Email: [redacted]
Post: PO Box 16205, BRISBANE CITY EAST, QLD 4002
Visit: Level 15, 53 Albert St, BRISBANE
ABN: 14 783 317 630

Incident Notification: Level 4 - MIN - Water Grid Emergency Update

Minister agency: Minister for Natural Resources, Mines & Energy and Minister for Trade

INCIDENT DETAILS:		CONTACT DETAILS:	
Event:	Wivenhoe Dam Releases 1230EST-06JAN11, Extreme Weather Event -2300EST-10JAN11	**Contact:**	
Report date:	24/01/2011 10:31 AM	**Role:**	WGM Duty Manager
Lodging agency:	SEQ WGM	**Phone:**	[redacted]
Severity level:	Level 4	**Mobile:**	
Incident status:	Active	**Email:**	[redacted]
Next briefing:			

Reason for briefing To provide an update on Water Grid Emergencies.

Asset Wivenhoe Dam, Mt Crosby WTP, Lowwod WTP, Somerset and Lockyer Valley distribution networks.

Location Wivenhoe, Mt Crosby, Lockyer Valley and Somerset Council areas.

Timing On 06 January 2011, an Alert level incident was declared, progressively upgraded to a Level 3 then Level 4 Emergency in response to planned dam releases from Wivenhoe Dam and a series of natural disaster events. Both the Wivenhoe and Lockyer Valley experienced prolonged and intense rainfall resulting in significant inflows to Wivenhoe Dam and the mid Brisbane River. Extreme weather events and flash flooding also occurred in the Lockyer Valley, Somerset and Ipswich areas resulting in asset damage and inundation.

Around the 11-12 January 2011, the rainfall and Brisbane, Bremer and Lockyer River flows resulted in bridge closures due to inundation also impacting road access and resupply of chemicals to Mt Crosby East and West Bank. Similar issues were experienced in other areas of the Water Grid.

The Alert Level Incident was escalated to a Level 3 Emergency on 10 January 2011 and a Level 4 Emergency on 11 January 2011. The Water Grid Emergency Management Team was activated in response to potential and actual impacts from the events.

What we know The Wivenhoe Dam flood compartment is now empty. The Brisbane River has returned to near normal levels and chemical supply deliveries are now reaching all SEQ Water Grid water treatment plants. QUU continues to conduct remediation works to local distribution assets within their area of operation and are managing boil water notices for some urban and rural centres within the Lockyer Valley and Somerset Council areas. All major Water Treatment Plants and bulk water distribution assets within South East Queensland are operating to normal specification, although some contingency arrangements remain in place including a temporary raw water pump at Lowood. Two very small Water Treatment Plants that serve the recreational camp sites at Atkinsons Dam and Wivenhoe Dam remain offline.

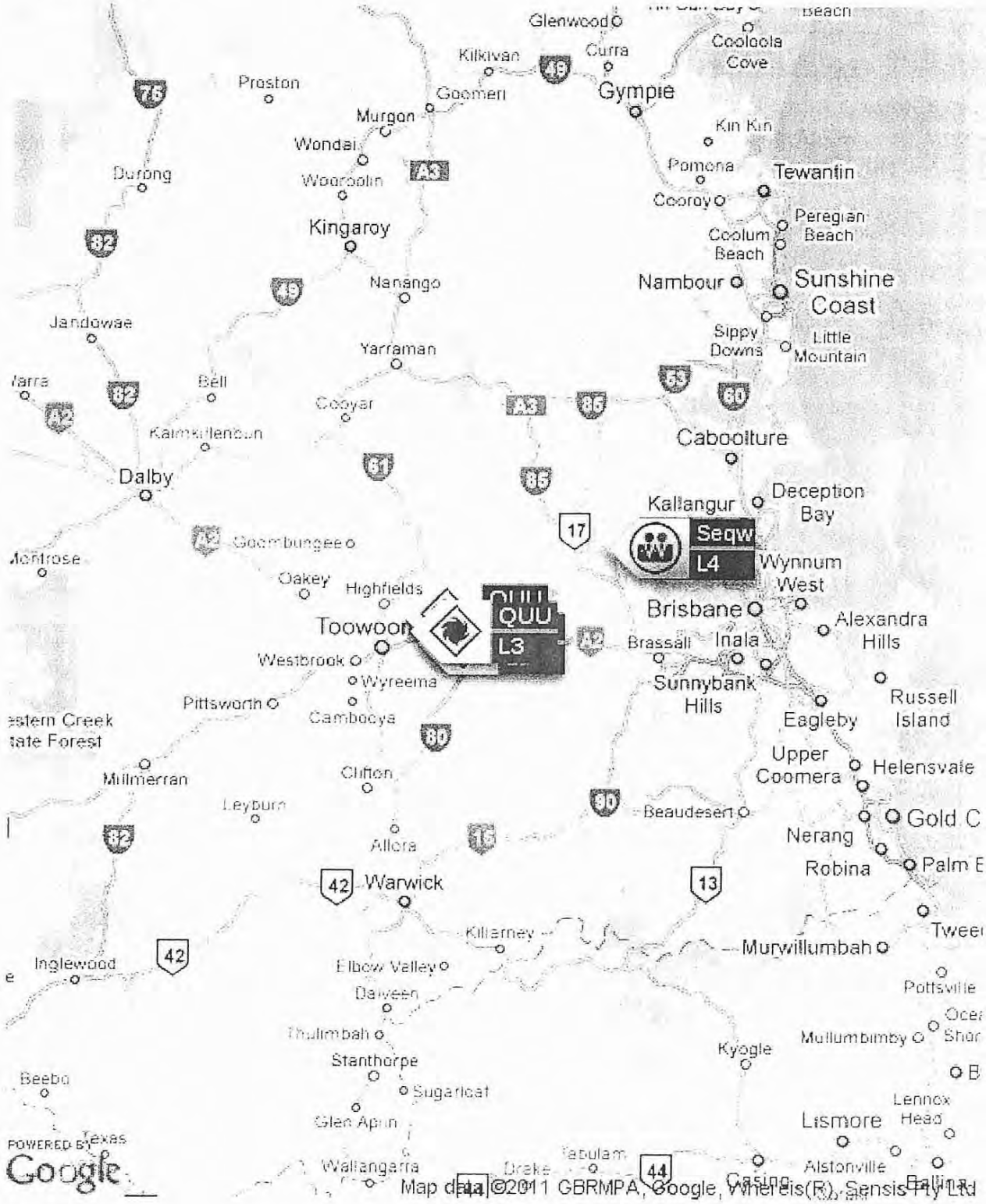
What we are doing While the Brisbane River is now at near normal levels and the Water Grid is operating normally, the Level 4 Emergency will be maintained until the boil water notices are lifted for

all major communities. Intensive water quality monitoring is ongoing within the Lockyer and Somerset regions, with two clear rounds of results returned over the weekend. It is expected that after one further round of testing and clear results, Qld Health will approve the lifting of the boil water notices. At that time, we expect to de-escalate to a Level 3 Emergency, which will then remain in place to facilitate whole of Grid coordination and communication as neccesary.

Emergency De-escalation is likely within the next seven days as asset repairs are finalised and boil water notices are lifted on the advice of Qld Health.

Action required This information is for noting.

Incident Map:



Gina O'Driscoll

From: Water Grid Emergency Manager [redacted]
Sent: Tuesday, 25 January 2011 4:07 PM
To: Barry Dennien
Subject: Water Grid Emergency Update
Attachments: MIN - Emergency Update 25JAN11.pdf

Colleagues

Please find attached latest update on Water Grid Emergency Management.

Regards

Water Grid Emergency Manager

Incident Notification: Level 4 - MIN - Emergency Update 25JAN11

Minister agency: Minister for Natural Resources, Mines & Energy and Minister for Trade

INCIDENT DETAILS:		CONTACT DETAILS:	
Event:	Wivenhoe Dam Releases 1230EST-06JAN11, Extreme Weather Event -2300EST-10JAN11	Contact:	
Report date:	25/01/2011 03:14 PM	Role:	WGM Duty Manager
Lodging agency:	SEQ WGM	Phone:	[redacted]
Severity level:	Level 4	Mobile:	
Incident status:	Active	Email:	[redacted]
Next briefing:			

Reason for briefing To provide an update on Water Grid Emergencies

Asset Wivenhoe Dam, Mt Crosby WTP, Lowood WTP, Somerset and Lockyer Valley distribution networks.

Location Wivenhoe, Mt Crosby, Lockyer Valley and Somerset Council areas.

Timing On 06 January 2011, an Alert level incident was declared, progressively upgraded to a Level 3 then Level 4 Emergency in response to planned dam releases from Wivenhoe Dam and a series of natural disaster events. Both the Wivenhoe and Lockyer Valley experienced prolonged and intense rainfall resulting in significant inflows to Wivenhoe Dam and the mid Brisbane River. Extreme weather events and flash flooding also occurred in the Lockyer Valley, Somerset and Ipswich areas resulting in asset damage and inundation.

In the period 11-12 January 2011, the rainfall and Brisbane, Bremer and Lockyer River flows resulted in bridge closures due to inundation also impacting road access and resupply of chemicals to Mt Crosby East and West Bank. Similar issues were experienced in other areas of the Water Grid.

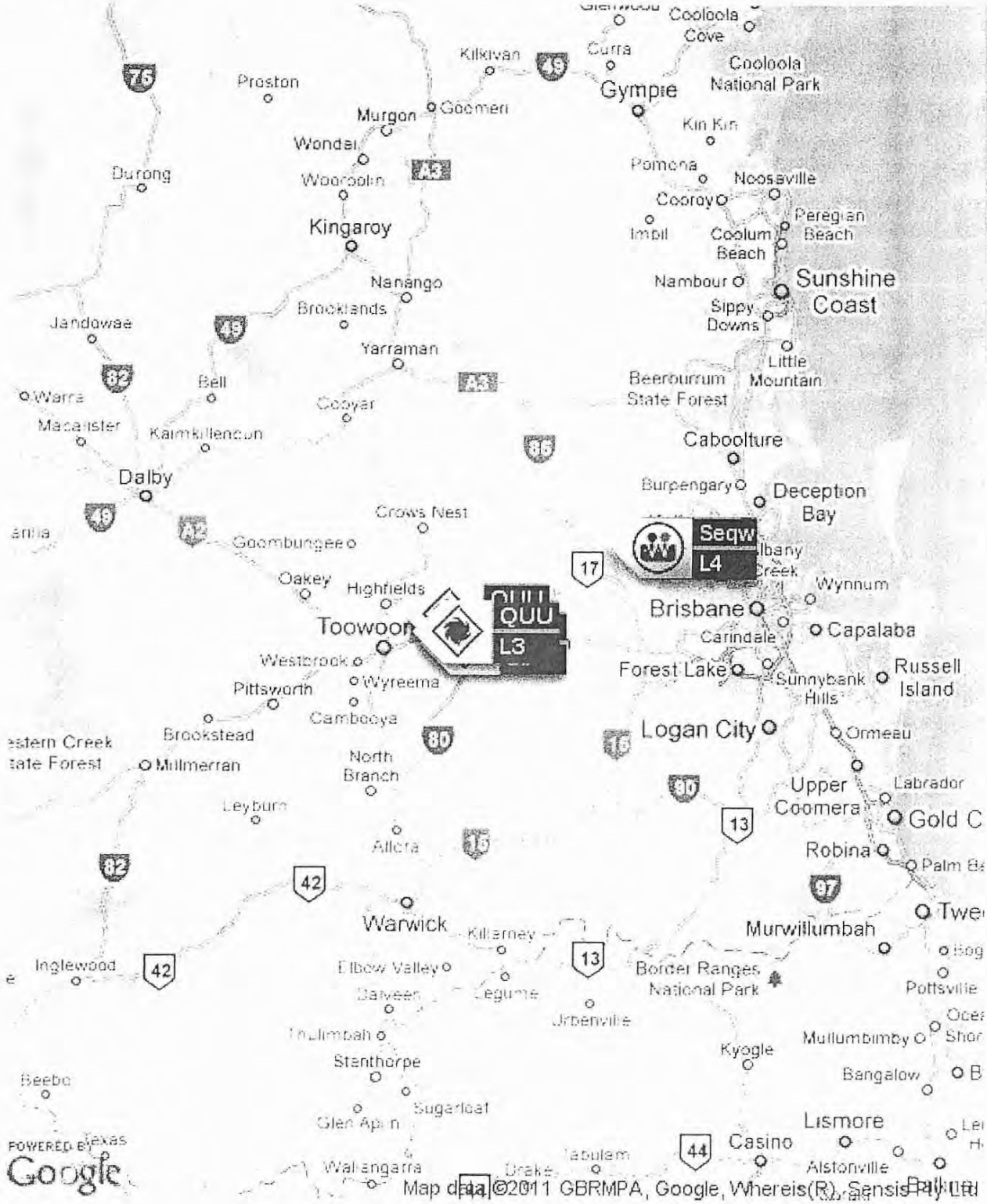
The Alert Level Incident was escalated to a Level 3 Emergency on 10 January 2011 and a Level 4 Emergency on 11 January 2011. The Water Grid Emergency Management Team was activated in response to potential and actual impacts from the events.

What we know The Wivenhoe Dam flood compartment is now empty. The Brisbane River has returned to near normal levels and chemical supply deliveries are now reaching all SEQ Water Grid water treatment plants. QUU continues to conduct remediation works to local distribution assets within their area of operation. Qld Health have given approval to lift boil water notices in the Lockyer and Somerset regions as of this afternoon (25 January 2011).

All major Water Treatment Plants and bulk water distribution assets within South East Queensland are operating to normal specification, although some contingency arrangements remain in place including a temporary raw water pump at Lowood. Two very small Water Treatment Plants that serve the recreational camp sites at Atkinsons Dam and Wivenhoe Dam remain offline.

What we are doing	QUU, in cooperation with SEQ Water Grid Manager and Qld Health are preparing communications to lift the boil water notices within the Somerset and Lockyer regions. As indicated in the last update on 24 January 2011, we are now de-escalating the current emergency from a Level 4 Emergency to a Level 3 Emergency. The Emergency will be closed once the Lowood raw water pump is fully operational and emergency coordination is no longer required.
Action required	This information is for noting.

Incident Map:



Gina O'Driscoll

From: Water Grid Emergency Manager [redacted]
Sent: Wednesday, 26 January 2011 4:13 PM
To: Barry Dennien
Subject: SEQ Water Grid incident briefing
Attachments: Ministerial Notification - E.coli detection at Marburg.pdf

Colleagues

Please find attached a briefing for the Water Grid incident, *Marburg E.coli detection.*

Incident severity: Level 3

Regards

Scott Denner

Duty Manager

SEQ Water Grid Manager

Phone: [redacted]

Email: [redacted]

Post: PO Box 16205, BRISBANE CITY EAST, QLD 4002

Visit: Level 15, 53 Albert St, BRISBANE

ABN: 14 783 317 630

Incident Notification: Alert - Ministerial Notification - E.coli detection at Marburg

Minister agency: Minister for Natural Resources, Mines & Energy and Minister for Trade

INCIDENT DETAILS:		CONTACT DETAILS:	
Event:	E-coli detection at Marburg	**Contact:**	
Report date:	26/01/2011 03:39 PM	**Role:**	WGM Duty Manager
Lodging agency:	SEQ WGM	**Phone:**	[redacted]
Severity level:	Alert	**Mobile:**	
Incident status:	Active	**Email:**	[redacted]
Next briefing:	p.m. Thursday 27 January 2011		

Reason for briefing	This briefing is to notify of a new Level 3 incident declared under the SEQ Water Grid Emergency Response Plan.
Asset	Marburg Reserviour
Location	Queen St, Marburg
Timing	The Water Grid Manager was notified by Queensland Urban Utilities (QUU) of the incident at 1359hr on Wednesday 26 January 2011.
What we know	QUU recieved an intial E.coli return of 1cfu on Tuesday 26 January 2011, and a second positive reading of 2 cfu on Wednesday 26 January 2011. Both readings exceed the Australian Drinking Water Guideline (ADWG) limit of 0 cfu.
What we are doing	QUU have conducted additional chlorination at the Marburg, Haiglsea, Rosewood and Upper John Street reserviours, and commenced an enhanced sampling cycle and scouring program. The Office of the Water Supply Regulator has been contacted, who advised QUU that they will contact Queensland Health to determine if any measures in addition to those already undertaken by QUU are required.
Action required	This information is for noting

Incident Map: