

Karen Noreen Waldman

Qualifications and Professional Background

Education

Masters of Business Administration, 1987-88
Australian Graduate School of Management,
University of NSW

Bachelor of Architecture (Hons), 1975-76
University of NSW

Bachelor of Science (Arch), 1971-74
University of NSW

Career Synopsis

2010-2011	Queensland Water Commission
2010-2011	Chief Executive Officer (was Executive Director)
2009	SEQ Distribution Entity (Interim) Pty Ltd
2009	Chief Operating Officer
1998-2009	Integral Energy
2004-March 2009	General Manager Regulatory and Corporate Affairs
2002-2004	General Manager Regulatory
2000-2002	General Manager Corporate Development and Company Secretary
1998-2000	General Manager Integral Energy Contracting

1989-1998**Sydney Water**

1997-1998 A/Group General Manager, Utilities
1995-1998 Regional Manager, Central
1993-1995 Customer Services and Marketing Manager, Central
1992-1993 Secondment, Marketing **Coopers and Lybrand**
1989-1992 Senior Strategic Planner

1977-1985**Krysztal, Waldman & Company**

1977-1985 Managing Director

Board Related Positions and Qualifications

Graduate, Australian Institute of Company Directors

Audit and Risk Committee, University of Western Sydney, 2005-2009

Company Secretary, Integral Energy, 2000-02

Waldman Karen

From: Waldman Karen
Sent: Tuesday, 26 October 2010 9:59 AM
To: Bagdon Tad
Subject: FW: Request for a review of dam operating levels

Hi Tad

What are implications of this request for us please, thanks, Karen.

From: Barry Dennien [REDACTED]
Sent: Tuesday, 26 October 2010 7:37 AM
To: Waldman Karen
Cc: [REDACTED]
Subject: Request for a review of dam operating levels

Karen

The Minister has asked if we can review the flood safety benefits of pre-emptively dropping Wivenhoe supply levels a few percentage points. I letter will arrive today asking:

- seeks, by end November 2010, advice as to the available options and the likely benefits
- states that, at a minimum, a review of the operation of Wivenhoe, North Pine and Leslie Harrison dams emphasises that this is only a temporary measure, reflecting that dams are full prior to the commencement of the traditional wet season
- seeks advice about a clear date or trigger beyond which dams will be allowed to fill to their full supply level.
- Seels advice on the best method, slow release or fast release over a few days as rain events are confirmed

I will cc the letter when it comes in.

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager

Phone: [REDACTED] | **Fax:** [REDACTED] | **Mobile:** [REDACTED]

Email: [REDACTED]

Visit: Level 15, 53 Albert Street, Brisbane

Post: PO Box 16205, City East Qld 4002

ABN: 14783 317 630

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Rose Rolf

From: Bagdon Tad
Sent: Tuesday, 26 October 2010 10:01 AM
To: Rose Rolf; Wong Wai Tong
Subject: FW: Request for a review of dam operating levels

Further risk analysis needed. Advice from WGM is that dropping to 90% has minimal impact on risk.

Tad Bagdon
Acting General Manager
Regional Planning and Policy
Queensland Water Commission
L16 53 Albert Street
Brisbane QLD 4000
Phone: [REDACTED]
Mobile: [REDACTED]

www.qwc.qld.gov.au

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Sent: Tuesday, 26 October 2010 7:37 AM
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Cc: Odriscoll Gina @ SEQWGM; spiller daniel @ SEQWGM
Subject: Request for a review of dam operating levels

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Barry Dennien

Chief Executive Officer

SEQ Water Grid Manager

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Waldman Karen

From: Waldman Karen
Sent: Thursday, 28 October 2010 11:22 AM
To: Bagdon Tad
Subject: Fw: Request for a review of dam operating levels

Attachments: Letter from Stephen Robertson MP RE Release of Water from Key Storages.tif; image001.gif



Letter from
Stephen Robertson ..
Hi Tad

For information and relevant action from QWC's perspective, Karen

----- Original Message -----

From: Gina O'Driscoll [REDACTED]
To: Waldman Karen
Sent: Thu Oct 28 09:52:22 2010
Subject: FW: Request for a review of dam operating levels



image001.gif (391
B)

Karen - copy of letter as promised in my previous email.

Regards

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager

Phone: [REDACTED] | Fax: [REDACTED] | Mobile: [REDACTED]

Email: [REDACTED]

Visit: Level 15, 53 Albert Street, Brisbane

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From: Barry Dennien
Sent: Tuesday, 26 October 2010 7:37 AM
To: Waldman Karen
Cc: Gina O'Driscoll; Dan Spiller
Subject: Request for a review of dam operating levels

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- Seeks advice on the best method, slow release or fast release over a few days as rain events are confirmed

I will cc the letter when it comes in.

Barry Dennien

Chief Executive Officer

SEQ Water Grid Manager

Phone: [REDACTED] | Fax: [REDACTED] | Mobile: [REDACTED]

Email: [REDACTED]

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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.

Level 17
61 Mary Street Brisbane 4000
PO Box 15216 City East
Queensland 4002 Australia
Telephone +61 7 3225 1861
Facsimile +61 7 3225 1828
Email nrmet@ministerial.qld.gov.au
ABN 65 959 415 158



**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

STEPHEN ROBERTSON MP

Level 17
61 Mary Street Brisbane 4000
PO Box 15216 City East
Queensland 4002 Australia
Telephone +61 7 3225 1861
Facsimile +61 7 3225 1828
Email nrmet@ministerial.qld.gov.au
ABN 65 959 415 158

Mcmaster Rosemarie

From: Barry Dennien [REDACTED]
Sent: Friday, 24 December 2010 10:17 AM
To: Bagdon Tad; Wong Wai Tong
Cc: Waldman Karen; [REDACTED]
Subject: URGENT
Attachments: Seqwater letter re Min s request on options for release of water.docx

Wiatong Tad

See attached a letter we are planning to send to Seqwater giving our permission to lower Wivenhoe below full supply level down to 95% and North Pine to 97.5% for flood mitigation purposes. The is only for the current wet season.

☐ We request the QWC note this proposed strategy and reply appropriately by midday today.

We apologise in advance for the short turnaround period. Current weather events have made us progress this issue.

Regards

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager

Phone: [REDACTED] | Fax: [REDACTED] | Mobile: [REDACTED]
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Visit: Level 15, 53 Albert Street, Brisbane
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Trim Ref: D/10/8129

24 December 2010

Mr Peter Borrows
Chief Executive Officer
Seqwater
PO Box 16146
City East Qld 4002

Dear Mr Borrows

I refer to our letter of _ regarding the request from Minister Stephen Robertson to consider options to, and the benefits of releasing water from key storages in anticipation of major inflows over the coming summer period.

As you are aware, your officers have since provided advice about options and benefits.

I advise that, from a water security perspective, the SEQ Water Grid Manager 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, we have 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.

Any specific releases to below Full Supply Level should be approved by myself or, if I am not available, the Director of Operations, SEQ Water Grid Manager.

Any releases should be managed by Seqwater in accordance with any statutory and regulatory obligations, such as the flood operations manuals and Resource Operations Plan. We recommend that you liaise with the Department of Environment and Resource Management to confirm any conditions that apply.

I acknowledge that these releases would have a negligible impact on the extent and duration of flooding during a major flood event. However, they may provide the ability to minimise the community and operational impacts of minor releases.

We have 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 *South East Queensland System Operating Plan* or our ability to meet our supply obligations to SEQ Water Grid customers.

From a water security perspective, I am advised that the Queensland Water Commission also does not have any objections to the proposed release.

Please note that these arrangements are intended to apply for the current wet season only, taking into account the level of storages and the rainfall forecasts over coming months.

I am keen to continue to work with you to investigate the optimal arrangements for future wet seasons. In particular, I am keen to work with you 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 increased water supply be expanded to include options to lower the full supply level for managing flood events.

Thank you for your assistance in this matter. If you have any questions, please do not hesitate to contact Mr Dan Spiller, Director of Operations, by telephone on [REDACTED] or via email at [REDACTED]

Yours sincerely

Barry Dennien
Chief Executive Officer

Mcmaster Rosemarie

From: Barry Dennien [REDACTED]
Sent: Friday, 24 December 2010 11:04 AM
To: Sommer Peter
Cc: [REDACTED] Waldman Karen
Subject: RE: URGENT
Follow Up Flag: Follow up
Flag Status: Completed
Attachments: Internal memo for Wivenhoe and Somerset December 2010 flood releases.docx

Peter

Our advice reflects Seqwater's advice and our joint experiences over the past weeks of flood releases.

Barry

From: Sommer Peter [REDACTED]
Sent: Friday, 24 December 2010 10:59 AM
To: Barry Dennien
Cc: Wong Wai Tong; Sweet Anita; Waldman Karen
Subject: FW: URGENT

To help with our response could you please provide the information provided from Seqwater on the options and benefits of the proposed release as referred to in your letter.

Regards

Peter Sommer
Director, Planning Projects
Regional Planning and Policy

Telephone: [REDACTED] **Facsimile:** [REDACTED] **Mobile:** [REDACTED]

Email: [REDACTED]

www.qwc.qld.gov.au

Queensland Water Commission
53 Albert Street, Brisbane Q 4000
PO Box 15087, City East Q 4002

From: Barry Dennien [REDACTED]
Sent: Friday, 24 December 2010 10:17 AM
To: Bagdon Tad; Wong Wai Tong
Cc: Waldman Karen; [REDACTED]
Subject: URGENT

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24/12/2010

only for the current wet season.

We request the QWC note this proposed strategy and reply appropriately by midday today.

We apologise in advance for the short turnaround period. Current weather events have made us progress this issue.

Regards

Barry Dennien

Chief Executive Officer

SEQ Water Grid Manager

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TRIM reference: D/10/7970**Date:** 24 January 2011

To: Gary Humphrys

From: Barry Dennien

Subject: Water security modelling for Wivenhoe Dam flood releases

Purpose

To seek in principle approval for water to be released from Wivenhoe and Somerset dams to 95 per cent (%) of storage capacity at any time until end March 2011.

Background

Minister Robertson wrote to our Chair on 25 October 2010 seeking advice regarding options to, and benefits of, releasing water from key SEQ Water Grid (Water Grid) storages in anticipation of major inflows over the coming summer (**Attachment 1**).

SEQ Water Grid Manager (WGM) officers have consulted with Seqwater regarding options and benefits of releasing water from key storages. Beyond the detailed advice outlined below, Seqwater officers have reiterated that Seqwater is confident of its ability to manage floods in accordance with the approved management plans and based on the existing Full Supply Level. While not necessary, Seqwater consider that in principle agreement to reduce storages to below Full Supply Level may provide operational advantages in some situations.

Relevant dams

In South East Queensland, Wivenhoe, Somerset, North Pine and Leslie Harrison dams are gated. Gates have also been installed as part of the Hinze Dam upgrade, which is scheduled to be completed by end January 2011. Other dams have a combination of small release valves and spillways and spill when above the Full Supply Level.

Gated dams provide an opportunity for water to be released to below the Full Supply Level in anticipation of future inflows.

Controlled releases impact upon downstream river levels, with the extent of impact dependent upon the amount releases. Controlled releases are only one of several factors that impact river levels, including tide and inflows downstream of the dam wall. For example, Wivenhoe and Somerset dams control only half of the Brisbane River catchment.

Probability of gate releases over the remainder of the wet season

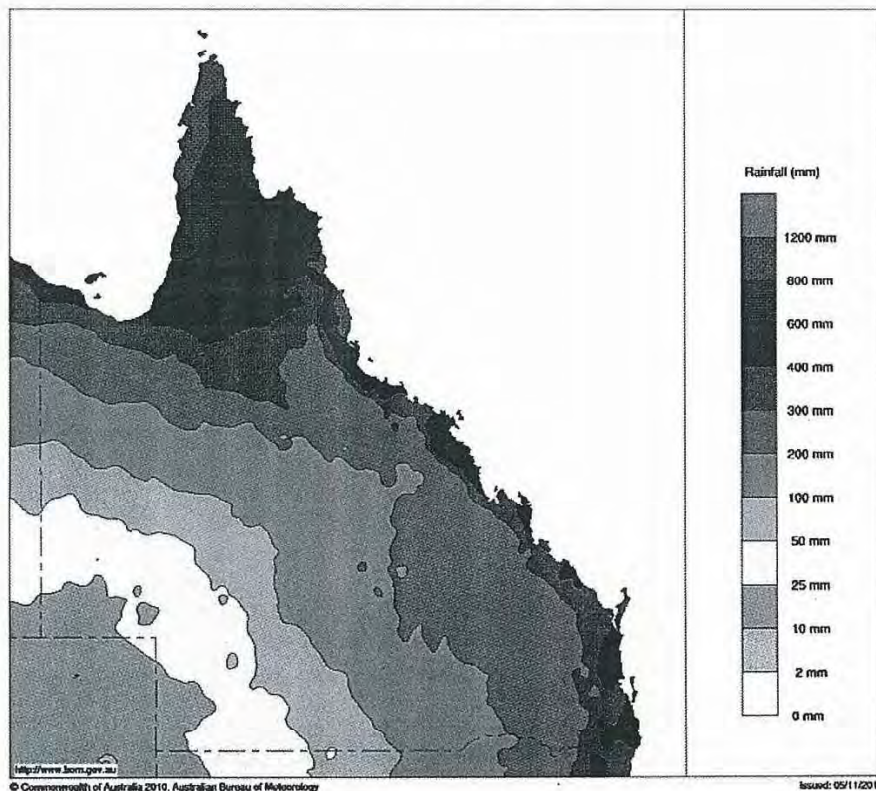
Grid 12 storages are at 100% of combined capacity, with further rainfall forecast. The Bureau of Meteorology has advised that:

- heavy rainfall is likely across South East Queensland over the Christmas holiday period
- higher than average rainfall to continue over the remainder of the traditional wet season, with 75% probability of exceeding at least 300 millimetres of rainfall across South East Queensland from December 2010 to the end February 2011.

Any further rainfall is expected to result in significant inflows to storages, due to catchments being wet. With storages being full, these inflows will trigger managed releases from Wivenhoe, Somerset and North Pine dams.

Figure 1: Rain outlook.

Rain Outlook: 75% chance of exceeding 1 December 2010 to 28 February 2011
Product of the National Climate Centre



Wivenhoe and Somerset dams: Medium to major flood events

Seqwater has advised that releases of greater than 3,500 cubic metres per second 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 megalitres (ML). This is equivalent to a release of about 16% 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 more significant than the negligible benefits. These potential security impacts include costs associated with the earlier or avoidable operation of the Gold Coast Desalination Plant (Desalination Plant) at capacity, as well as the increased probability of triggering the implementation of a drought response plan.

More detailed investigation of opportunities to 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 Meteorology, Councils and the Water Grid Manager.

Wivenhoe and Somerset dams: Minor flood 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 possible. In addition:

- There are resource implications involved in the activation of the flood control centre. Under flood management plans, the flood control 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 2010.
- 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.

Recommendation

It is recommended that the WGM advise Seqwater that, from a water security perspective:

- in principle, we would not object to water being released from Wivenhoe and Somerset dams to 95% of storage capacity at any time until end March 2011
- any specific release should be endorsed by the Chief Executive Officer (CEO) or Director of Operations, prior to being made
- approval is for the existing wet season only and is subject to review prior to the 2011 wet season.

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 per day was released during November 2010 and mid December 2010. At this rate, the additional releases could occur in approximately half a day.
- Ongoing gate releases of up to 30,000 ML per day, which would not isolate any residents but could inundate some lower bridges that cause inconvenience.
- Ongoing valve release of up to about 4,300 ML per day, which can be maintained without inundate any bridges.

Actual releases will be decided based on operational considerations.

The CEO and the Director of Operations will seek to ensure that storages are managed with the objective of being at Full Supply Level at the end of the wet season, in April 2011.

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 as:

- 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 into the dams. Modelling indicates that the reduction would have a minimal impact on the probability of key Water Grid storages falling to 40% of capacity over the next five years.

Four cases were developed to assess the impact of the potential flood releases below Full Supply Level. Each was based on the model used to develop the October 2010 version of the Operating Strategy, with an update for the operation of the Desalination Plant. The outline of each case is shown below in **Table 1**.

The first two runs assess the difference in water security starting in January 2011 with storages at 100% and 95%. The second two cases assessed the scenario where dams were reduced to 95% and were not refilled this wet season, and therefore the simulation started in June 2011.

Table 1: Summary of models.

Case	Wivenhoe and Somerset dam level	Start month
1	100%	January 2011
2	95%	January 2011
3	100%	June 2011
4	95%	June 2011

Results show that the ability to meet the risk criteria stated in the South East Queensland System Operating Plan (SOP) (refer **Table 2**) is not affected by this change in supply level in January 2011. In addition, the difference in probability of Wivenhoe and Somerset dams refilling is negligible after six months. If releases are made to bring Wivenhoe and Somerset dams to 95% of combined storage, hydrologic modelling using stochastically generated inflows indicates that the point at which the probability of reaching 40% was brought forward by two months (refer **Figures 2 and 3**).

Table 2: SOP rules.

Trigger	1 year	3 years	5 years
T1	<0.2%	Not specified	<5%
T2	Not specified	<0.5%	<1%

Table 3: Current levels, starting January 2011 (case 1).

Trigger	1 year	3 years	5 years
T1	0	0	0.01%
T2	0	0	0
Brisbane System reaching 40%	0.00%	0.00%	0.01%

Table 4: Wivenhoe and Somerset dams at 95%, starting January 2011 (case 2).

Trigger	1 year	3 years	5 years
T1	0	0	0.01%
T2	0	0	0
Brisbane System reaching 40%	0.00%	0.00%	0.01%

Table 5: Current levels, starting June 2011 (case 3).

Trigger	1 year	3 years	5 years
T1	0	0	0.01%
T2	0	0	0
Brisbane System reaching 40%	0.00%	0.00%	0.01%

Table 6: Wivenhoe and Somerset dams at 95%, starting June 2011 (case 4).

Trigger	1 year	3 years	5 years
T1	0	0	0.01%
T2	0	0	0
Brisbane System reaching 40%	0.00%	0.00%	0.01%

Figure 2: Storage volume forecast Brisbane System (case 1).

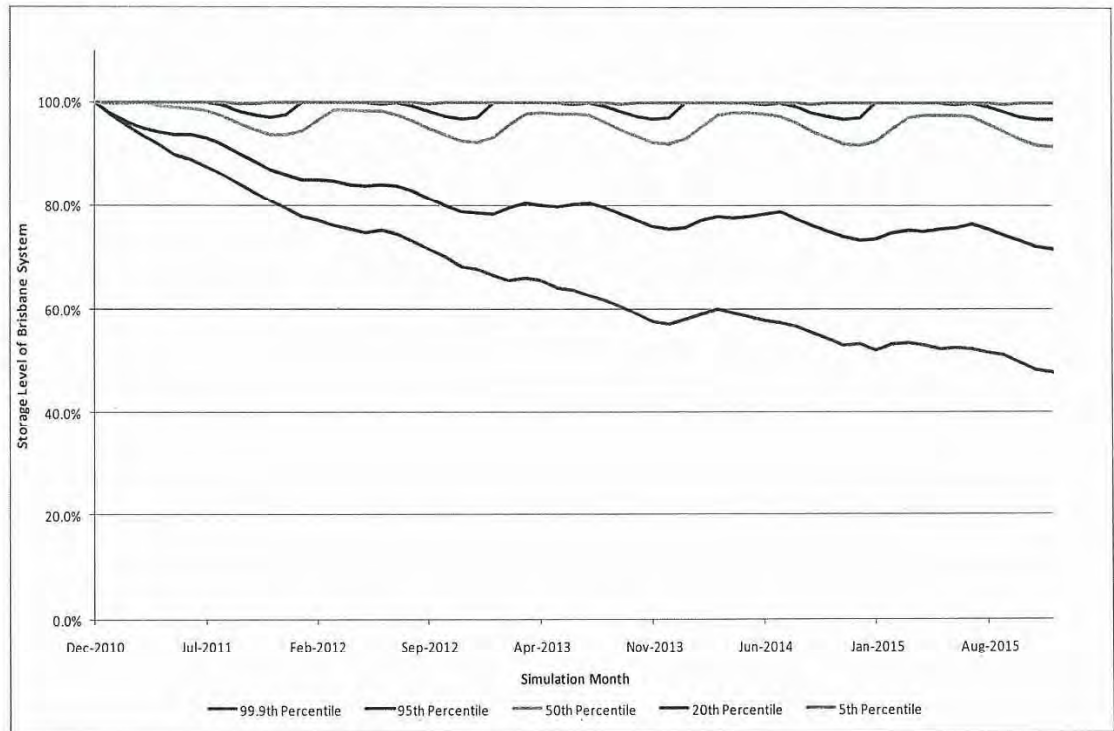


Figure 2: Storage volume forecast Brisbane System (case 2).

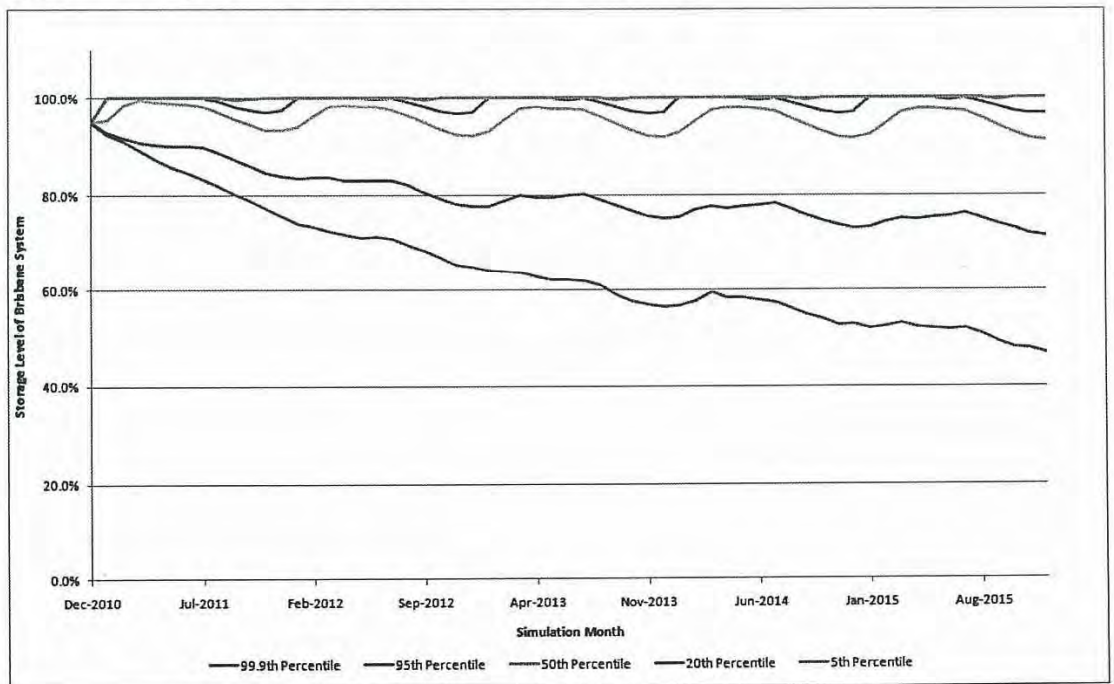


Figure 1 shows that, under the current case, 50% of long-term simulated inflow scenarios maintain the Brisbane System at full storage capacity over the next three months. With the release to 95% of Full Supply Level, 50% of simulated inflows return the dams to Full Supply Level in approximately four months.

As a worst case scenario, a scenario was run that reduced the Full Supply Level of Wivenhoe and Somerset dams to 95% of the current level for the full duration of the simulation (that is, a permanent reduction). This was undertaken to indicate the lower bound of results that could be expected when simulating the proposed dam release approach. Results for this scenario indicated that the probability of reaching 40% in the Brisbane System increased to 0.03% in five years, as compared to the base case of 0.01%.

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, it is recommended that the WGM advise Seqwater that, from a water security perspective:

- in principle, it would not object to water being released to 97.5% of storage capacity at any time until end March 2011
- any specific release should be endorsed by the CEO or Director of Operations prior to being made
- approval is for the existing wet season only, subject to review prior to the 2011 wet season.

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, it is recommended that no in-principle approval be made for pre-emptive releases from this dam.

Summary of recommendations

It is recommended that the SEQ Water Grid Manager Board (Board) approve that:

- from a water security perspective, it would not object to water being released from Wivenhoe and Somerset dams to 95% of the Full Storage Level at any time until end March 2011
- from a water security perspective, it would not object to water being released from North Pine Dam to 97.5% of the Full Storage Level at any time until end March 2011
- any specific release should be endorsed by the CEO or Director of Operations prior to being made
- approval is for the existing wet season only, subject to review prior to the 2011 wet season.

The proposed letter from the Chair forms **Attachment 2**.

This advice is consistent with the verbal briefing provided to Minister Robertson at the 13 December 2010 Board meeting. The response to Minister Robertson will reflect this advice (refer **Attachment 3**).

Waldman Karen

From: Sommer Peter
Sent: Friday, 24 December 2010 11:17 AM
To: Barry Dennien
Cc: [REDACTED]; Waldman Karen; Wong Wai Tong
Subject: RE: URGENT
Follow Up Flag: Follow up
Flag Status: Completed

Given that we will be guided by Seqwater's advice, as the experts for operating the dam, there advice would add weight to the argument.

Could you provide this?

Regards Peter

From: Barry Dennien [REDACTED]
Sent: Friday, 24 December 2010 11:04 AM
To: Sommer Peter
Cc: [REDACTED]
Subject: RE: URGENT

Peter

Our advice reflects Seqwater's advice and our joint experiences over the past weeks of flood releases.

Barry

From: Sommer Peter [REDACTED]
Sent: Friday, 24 December 2010 10:59 AM
To: Barry Dennien
Cc: Wong Wai Tong; Sweet Anita; Waldman Karen
Subject: FW: URGENT

To help with our response could you please provide the information provided from Seqwater on the options and benefits of the proposed release as referred to in your letter.

Regards

Peter Sommer
Director, Planning Projects
Regional Planning and Policy
Telephone: [REDACTED] Facsimile: [REDACTED] Mobile: [REDACTED]
Email: [REDACTED]
www.qwc.qld.gov.au

Queensland Water Commission

53 Albert Street, Brisbane Q 4000
PO Box 15087, City East Q 4002

From: Barry Dennien [REDACTED]
Sent: Friday, 24 December 2010 10:17 AM
To: Bagdon Tad; Wong Wai Tong
Cc: Waldman Karen; spiller daniel @ SEQWGM
Subject: URGENT

Wiatong Tad

See attached a letter we are planning to send to Seqwater giving our permission to lower Wivenhoe below full supply level down to 95% and North Pine to 97.5% for flood mitigation purposes. The is only for the current wet season.

We request the QWC note this proposed strategy and reply appropriately by midday today.

We apologise in advance for the short turnaround period. Current weather events have made us progress this issue.

Regards

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
Phone: [REDACTED] | **Fax:** [REDACTED] | **Mobile:** [REDACTED]
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Waldman Karen

From: Sommer Peter
Sent: Friday, 24 December 2010 11:38 AM
To: Waldman Karen; Wong Wai Tong
Subject: FW: Discussion Paper on Dam Full Supply Level Investigations Seqwater Gated Storages
Attachments: Discussion Paper on Dam Full Supply Level Investigations Seqwater Gated Storages.docx

Seqwaters advice as referred to in the proposed SEQWGM letter.

In summary Seqwaters advice was "This is not considered a viable option for the following reasons"

Regards Peter

From: Barry Dennien [REDACTED]
Sent: Friday, 24 December 2010 11:27 AM
To: Sommer Peter
Cc: spiller daniel @ SEQWGM
Subject: Discussion Paper on Dam Full Supply Level Investigations Seqwater Gated Storages

Peter, attached.

Regards
Barry

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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 < 3500m³/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	m ³ /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 of 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 be 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 > 3500m³/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 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

Attachment 1

Discussion Paper on Dam Full Supply Level Investigations Seqwater Gated Storages

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 around 15%. 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 probabilistic 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%.

Mcmaster Rosemarie

From: Barry Dennien [REDACTED]
Sent: Friday, 24 December 2010 12:03 PM
To: Waldman Karen
Subject: RE: URGENT

Thanks Karen

From: Waldman Karen [REDACTED]
Sent: Friday, 24 December 2010 11:56 AM
To: Barry Dennien
Cc: Sommer Peter; Wong Wai Tong; Bagdon Tad; pborrows@seqwater.com.au
Subject: FW: URGENT
Importance: High

Hi Barry

The QWC has considered the request by the SEQ Water Grid Manager to comment on the proposed drawdown of:

- Wivenhoe and Somerset dams to 95% of their combined full supply level
- North Pine Dam being drawn down to 97.5% of it's full supply level

The Commission note that the Water Grid Manager has no concerns and advises that the drawdown will not infringe the risk criteria stipulated in the SEQ System Operating Plan or the interim operating strategy. The Water Grid Manager has also stated that this drawdown will not impact on their ability to meet supply obligations to the Water Grid customers. Based on this advice, the Commission has no objection to the proposed release.

It is noted also that such releases are an operational matter for Seqwater, within the context of the Resource Operations Plan, where there is no condition in the SEQ System Operating Plan that regulates releases from the dams concerned.

It is however recommended that Seqwater liaise with the Department of Environment and Resource Management to confirm their understanding of any conditions that apply, particularly in relation to dam safety matters.

Regards, Karen

From: Barry Dennien [REDACTED]
Sent: Friday, 24 December 2010 10:17 AM
To: Bagdon Tad; Wong Wai Tong
Cc: Waldman Karen; spiller daniel @ SEQWGM
Subject: URGENT

Wiatong Tad

See attached a letter we are planning to send to Seqwater giving our permission to lower Wivenhoe below full supply level down to 95% and North Pine to 97.5% for flood mitigation purposes. The is only for the current wet season.

We request the QWC note this proposed strategy and reply appropriately by midday today.

We apologise in advance for the short turnaround period. Current weather events have made us progress this issue.

Regards

Barry Dennien

Chief Executive Officer

SEQ Water Grid Manager

Phone: [REDACTED] | Fax: [REDACTED] | Mobile: [REDACTED]

Email: [REDACTED]

Visit: Level 15, 53 Albert Street, Brisbane

Post: PO Box 16205, City East Qld 4002

ABN: 14783 317 630

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Our ref: ME/11/0179

25 MAR 2011

Mr Peter Borrows
Chief Executive Officer
Seqwater
PO Box 16146
City East QLD 4002

By email to: [REDACTED]

Peter
Dear Mr Borrows

Thank you for your letter of 22 March 2011 including your request for advice on a proposed extension to the period that Wivenhoe Dam be kept at the Interim Security Supply Level from 1 April 2011 to 30 June 2011.

The Queensland Water Commission has no objection to this proposal as a temporary measure. Our analysis of the total grid capacity shows that the impact on water security by the extension of time is compliant with the South East Queensland System Operating Plan Risk Criteria.

It should be noted that operational and regulatory impacts such as potential increased pumping costs have not been assessed. Advice from the responsible agency or entity would need to also be considered.

If you would like to further discuss these matters or require any information, please contact Mr Tad Bagdon, Acting General Manager, Regional Planning and Policy on [REDACTED]

Yours sincerely

[REDACTED]

Ms Karen Waldman
Chief Executive Officer

RECEIVED

09 SEP 2010



Hon Stephen Robertson MP
Member for Stretton

COPY



Queensland
Government

Ref CTS 13479/10

01 SEP 2010

Minister for Natural Resources,
Mines and Energy and
Minister for Trade

Ms Mary Boydell
Commissioner
Queensland Water Commission
PO Box 15087
CITY EAST QLD 4002

Dear Ms Boydell

The Queensland Water Commission's (QWC) South East Queensland (SEQ) Water Strategy reiterates that the optimal operating strategy for the SEQ Water Grid consists of using purified recycled water (PRW) to augment drinking water supplies only when combined storages fall to 40 % capacity.

In view of the short to medium-term water security outlook for SEQ, I am seeking your advice on the optimal operating arrangements for the Water Grid.

Advice is also being sought by Responsible Ministers from WaterSecure and the SEQ Water Grid Manager on optimal operating arrangements for the Gold Coast Desalination Project, the Western Corridor Recycled Water Project, and the SEQ Water Grid, as well as current and expected demand scenarios for the Water Grid, particularly in relation to PRW.

I understand that the Water Grid Manager and WaterSecure will be working closely together in responding to the request and I encourage QWC to liaise directly with representatives of these entities.

Should you have any further enquiries, please do not hesitate to contact Mr Don Clunes, Manager, Strategic Water Entities Governance of the Department of Environment and Resource Management on telephone [REDACTED]

Yours sincerely

STEPHEN ROBERTSON MP

Level 17
61 Mary Street Brisbane Qld 4000
PO Box 15216 City East
Queensland 4002 Australia
Telephone +61 7 3225 1861
Facsimile +61 7 3225 1828
Email unneth@ministerial.qld.gov.au

Martin Amy (QWC)

From: Springer Kristy
Sent: Friday, 12 November 2010 5:09 PM
To: [REDACTED]

Cc: Waldman Karen
Subject: Optimal Operating Strategy for the SEQ Water Grid
Attachments: Signed response - Commissioner Mary Boydell to Minister Stephen Robertson re Optimal Operating Arrangements for the Water Grid signed and posted 12 November 2011.pdf; Optimum Operating Strategy for the SEQ Water Grid 12 November 2010.pdf

Good afternoon

Please find attached Commissioner Mary Boydell's response to Minister Robertson's letter of 1 September 2010 requesting advice on the optimal operating strategy for the South East Queensland Water Grid. The letter and report were forwarded to the Minister's office this afternoon.

Kind regards

Kristy Springer

Senior Policy and Project Officer
Corporate Policy Unit - Queensland Water Commission
Department of Environment and Resource Management
T: [REDACTED] | Ext: [REDACTED] | F: [REDACTED] | PO Box 15087 City East QLD 4002 | E: [REDACTED]

4/05/2011

Our ref: ME/10/0678

12 NOV 2010

The Honourable Stephen Robertson MP
Minister for Natural Resources, Mines and Energy and Minister for Trade
PO Box 15216
CITY EAST QLD 4002

Dear Minister

Optimal Operating Strategy for the South East Queensland Water Grid

Thank you for your letter of 1 September 2010 requesting that the Queensland Water Commission (Commission) provide you with advice on the optimal operating strategy for the SEQ Water Grid, particularly in relation to the South East Queensland (Gold Coast) Desalination Facility and the Western Corridor Recycled Water Scheme, given the current full storage level in key South East Queensland (SEQ) storages.

Please find attached our report titled "Optimal Operating Strategy for the SEQ Water Grid". The report provides an assessment of the SEQ Water Grid Manager's (WGM) advice regarding the optimal operating arrangements and makes recommendations related to the effective management of water security for the SEQ Water Grid.

The Commission has held discussions with WaterSecure and the WGM, and information has been shared regarding development of the advice on the optimal operating strategy.

The Commission has undertaken a strategic review of water security implications of the operating strategy recommended by the WGM, and makes the following conclusions:

- The WGM has assessed the recommended operating strategy against the security risk criteria set out in the System Operating Plan (SOP). These criteria consider a period of five years. The Commission's assessment is that in this period there is a very low chance (0.1 per cent probability) that purified recycled water (PRW) will be required to be added into Wivenhoe Dam to respond to a drought.
- The Commission considers the operating strategy recommended by the WGM meets the risk criteria for the SOP.
- The Commission has considered the long term security risks as demand approaches the Level of Service yield (supply capacity). Beyond 2012, the capacity to ensure secure water supply for SEQ is critically dependent on:
 - Policy consistency – an assumption that current Government policy will continue to enable operation of the desalination facility when required and utilise PRW as an emergency source of supply; and

- Manufactured Water Readiness – ensuring the SEQ (Gold Coast) Desalination Facility and advanced water treatment plants' (AWTP) Technical, Capability and Regulatory Risks are managed to enable the reliable and timely use of the manufactured water assets to full capacity when required.
- As part of the Commission's ongoing role, it will continue to monitor the various assumptions and parameters that underpin its water security modelling.
- The security risk increases somewhat in the long term. However, this is acceptable given the five year horizon for the SOP Risk Criteria and the likely timeframes associated with equipment remobilisation.
- The manufactured water assets provide valuable long term "insurance" to the SEQ Water Grid and also contribute to deferral of the next major source of supply to meet demand growth.
- The strategic value of the desalination facility is generally understood. However, the Commission is concerned that the strategic value of the AWTP is not as widely understood. The Commission considers the AWTP should be treated and managed as valuable water grid assets. They should not be "passively" decommissioned as a result of inadequate care and maintenance and/or risk management.

To this end, the Commission recommends the following actions to ensure the short and long term security of supply for SEQ:

1. Consider an appropriate communication strategy when the new operating strategy is announced to encourage community understanding that future water security depends on:
 - certainty that the desalination facility can be operated when required; and
 - certainty that utilisation of PRW will be allowed as an emergency source of supply
 and, if not, that some alternative source of supply would be required.
2. Support the Commission requiring a holistic Manufactured Water Readiness Risk Management Plan be prepared and enacted in the *South East Queensland Water Strategy* and the SOP that will "institutionalise" effective management of Technical, Capability and Regulatory Risks.
3. Take account of the Manufactured Water Readiness Risk Management Plan in carrying out governance oversight of WaterSecure (for example appointment of Boards and review of financial performance).
4. Take account of the Manufactured Water Readiness Risk Management Plan in establishing the framework for Economic Regulation.

I trust that the above advice meets your requirements.

If you require any further information, please contact me on [REDACTED]

Yours sincerely

[REDACTED]

Mary Boydell
Commissioner

Enc: Queensland Water Commission Report titled "Optimal Operating Strategy for the SEQ Water Grid", 12 November 2010

Cc: The Honourable Andrew Fraser MP, Treasurer and Minister for Employment and Economic Development



**Optimal Operating Strategy for the SEQ Water Grid
Strategic Framework and Risk Assessment**

Report to the

**Minister for Natural Resources, Mines and Energy and
Minister for Trade**

12 November 2010

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Annexure 1A1

Hydrologic Risk Assessment – Scenarios for Operation of Manufactured Water

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Executive Summary

This report responds to a request to the Commissioner from the Minister for Natural Resources, Mines and Energy and Minister for Trade for advice on the optimal operating arrangement for the South East Queensland (SEQ) Water Grid, in view of the current full storage level in key SEQ Storages.

The Queensland Water Commission (Commission) has been provided with a draft report by the SEQ Water Grid Manager (WGM), and a draft letter from WaterSecure to the Responsible Ministers. The Commission has previously consulted on this matter with the WGM and WaterSecure through various meetings.

Context

In November 2008, the Government announced a policy to introduce purified recycled water (PRW) produced from the Western Corridor Recycled Water Scheme (WCRWS) into Wivenhoe Dam as an emergency source of supply when the combined key water grid storages fall below 40% of their total combined capacity. The System Operating Plan (SOP) Water Security Rule (Rule 8.2) requires that the supply of water from the WCRWS and the SEQ Gold Coast Desalination Facility will be maximised when key water grid storages fall below 40%.

The Government's policy and the Security Rule underpin critical assumptions in determining the yield of the SEQ Water Grid while achieving the Level of Service (LoS) objectives.

Conclusions

The Commission recommends that the Government **notes** the following conclusions:

1. The WGM has assessed the recommended operating strategy against the security risk criteria set out in the SOP. These criteria consider a period of five years. The Commission's assessment is that in this period there is a very low chance (0.1% probability) that PRW will be required to be added to Wivenhoe Dam to respond to a drought.
2. The Commission considers the operating strategy recommended by the WGM meets the risk criteria for the SOP.
3. The Commission has considered the longer term security risks arising from emerging drought (low supply) and/or as demand approaches the LOS yield (supply capacity). Beyond 2012, the capacity to ensure secure water supply for SEQ is critically dependent on:
 - a. Policy consistency - an assumption that current Government policy will continue to enable operation of the desalination facility when required and utilise PRW as an emergency source of supply; and
 - b. Manufactured Water Readiness – ensuring that the SEQ Gold Coast Desalination Facility and Advanced Water Treatment Plants' (AWTP) *Technical Risk, Capability Risks* and *Regulatory Risks* are managed to enable the reliable and timely use of the manufactured water assets to full capacity when required.
4. As part of the Commission's ongoing role, it will continue to monitor the various assumptions and parameters that underpin its water security modelling.

5. The security risk increases somewhat in the long term. However, this is acceptable given the five year horizon for the SOP risk criteria and the likely timeframes associated with equipment remobilisation.
6. The manufactured water assets provide valuable long term "drought insurance" to the SEQ Water Grid and also contribute to deferral of the next major source of supply to meet demand growth.
7. The strategic value of the desalination facility is generally understood. However, the Commission is concerned that the strategic value of the AWTPs is not as widely understood. The Commission considers the AWTPs should be treated and managed as valuable water grid assets. They should not be "passively" decommissioned as a result of inadequate care and maintenance and/or risk management.

Recommendations

The Commission **recommends** that the Government:

1. Consider an appropriate *Communication Strategy* when the new operating strategy is announced to encourage community understanding that future water security depends on:
 - certainty that the desalination facility can be operated when required, and
 - certainty that utilisation of PRW will be allowed as an emergency source of supplyand, if not, that some alternative source of supply would be required.
2. Support the Commission requiring a holistic *Manufactured Water Readiness Risk Management Plan* be prepared and enacted through the *South East Queensland Water Strategy* and the SOP that will "institutionalise" effective management of Technical, Capacity and Regulatory Risks.
3. Take account of the *Manufactured Water Readiness Risk Management Plan* in carrying out governance oversight of WaterSecure (for example appointment of Boards, review of financial performance).
4. Take account of the *Manufactured Water Readiness Risk Management Plan* in establishing the framework for Economic Regulation.

1 Introduction

On 1 September 2010, the Minister for Natural Resources, Mines and Energy and Minister for Trade wrote to the Commissioner of the Queensland Water Commission (Commission) requesting advice on the optimal operating arrangement for the South East Queensland (SEQ) Water Grid in view of the current full storage level in the key SEQ storages. This report responds to the Minister's request.

A similar letter was written by the Minister for Natural Resources, Mines and Energy and Minister for Trade, and the Treasurer to the chairs of the SEQ Water Grid Manager (WGM) and WaterSecure on 3 September 2010.

The Commission has had access to the WGM's draft advice: *Climate Resilient Supplies – basis for advice regarding demand and operating strategies* ("WGM Report") provided on 4 November 2010; and a proposed letter from WaterSecure to Responsible Ministers. The Commission has provided input to the WGM and WaterSecure through a number of meetings.

This Commission's report provides an assessment of the WGM's advice regarding the optimal operating arrangements.

2 Summary and Recommendations

2.1 Strategic security review

In November 2008, the Government announced a policy to introduce purified recycled water (PRW) produced from the Western Corridor Recycled Water Scheme (WCRWS) into Wivenhoe Dam as an emergency source of supply when the combined key water grid storages fall below 40% of their total combined capacity. The System Operating Plan (SOP) Water Security Rule (Rule 8.2) requires that the supply of water from the WCRWS and the SEQ Gold Coast Desalination Facility will be maximised when key water grid storages fall below 40%.

The Government's policy and the Security Rule underpin critical assumptions in determining the yield of the SEQ Water Grid whilst achieving the Level of Service (LoS) objectives.

Conclusions

The Commission recommends that the Government **notes** the following conclusions:

1. The WGM has assessed the recommended operating strategy against the security risk criteria set out in the SOP. These criteria consider a period of five years. The Commission's assessment is that in this period there is a very low chance (0.1% probability) that PRW will be required to be added to Wivenhoe Dam to respond to a drought.
2. The Commission considers the operating strategy recommended by the WGM meets the risk criteria for the SOP.
3. The Commission has considered the longer term security risks arising from emerging drought (low supply) and/or as demand approaches the LoS yield (supply capacity). Beyond 2012, the capacity to ensure secure water supply for SEQ is critically dependent on:

- a. Policy consistency – an assumption that current Government policy will continue to enable operation of the desalination facility when required and utilise PRW as an emergency source of supply; and
 - b. Manufactured Water Readiness – ensuring that the SEQ Gold Coast Desalination Facility and Advanced Water Treatment Plants' (AWTP) *Technical Risk, Capability Risks* and *Regulatory Risks* are managed to enable the reliable and timely use of the manufactured water assets to full capacity when required.
4. As part of the Commission's ongoing role, it will continue to monitor the various assumptions and parameters that underpin its water security modelling.
5. The security risk increases somewhat in the long term. However, this is acceptable given the five year horizon for the SOP risk criteria and the likely timeframes associated with equipment remobilisation.
6. The manufactured water assets provide valuable long term "drought insurance" to the SEQ Water Grid and also contribute to deferral of the next major source of supply to meet demand growth.
7. The strategic value of the desalination facility is generally understood. However the Commission is concerned that the strategic value of the AWTPs is not as widely understood. The Commission considers the AWTPs should be treated and managed as valuable water grid assets. They should not be "passively" decommissioned as a result of inadequate care and maintenance and/or risk management.

2.2 Policy consistency

As noted, current Government policy is that PRW from the AWTPs will be added to Wivenhoe Dam when the combined storages in SEQ fall to 40 per cent.

A key risk identified by the Commission is that there may be lack of community acceptance in future for using PRW for augmentation of the raw water supply during a prolonged drought. If the availability of PRW when required cannot be relied upon, then this may place the ability to achieve the LoS objectives beyond 2012 (for a worst case scenario) at material risk, without further capital investment. Similarly there is a risk of lack of community support for turning on the desalination facility when it is required.

Recommendation

The Commission **recommends** that the Government

1. consider an appropriate *Communication Strategy* when the new operating strategy is announced to encourage community understanding that future water security depends on
 - certainty that the desalination facility can be operated when required, and
 - certainty that utilisation of PRW will be allowed as an emergency source of supplyand, if not, that some alternative source of supply would be required.

2.3 Manufactured Water Readiness

The Commission's risk assessment has concluded that the desalination facility and mothballed AWTPs must be able to be reliably called into service when they are required (*Manufactured Water Readiness*). This requires effective management of:

- *Technical Risks* – through active asset management programs, monitoring and research programs;
- *Capacity Risks* – through ensuring appropriate organisational, governance and financial capacity; and
- *Regulatory Risks* – through ensuring required regulatory approvals and consents will continue to be available.

Recommendations

The Commission **recommends** that the Government:

2. support the Commission requiring a holistic *Manufactured Water Readiness Risk Management Plan* through the *South East Queensland Water Strategy* and the SOP that will "institutionalise" effective management of Technical, Capacity and Regulatory Risks;
3. take account of the *Manufactured Water Readiness Risk Management Plan* in carrying out governance oversight of WaterSecure (for example appointment of Boards, review of financial performance); and
4. take account of the *Manufactured Water Readiness Risk Management Plan* in establishing the framework for Economic Regulation.

Subject to further analysis, it is envisaged that aspects of the *Manufactured Water Readiness Risk Management Plan* would be enacted through:

- amendments to the SOP which establish appropriate obligations and reporting arrangements for the WGM and WaterSecure;
- possible amendments to the Market Rules and Contracts;
- regional drought response plan and entity drought management plans; and
- annual reporting by the Commission for the *South East Queensland Water Strategy*.

2.4 Consequential amendments to the System Operating Plan

A number of consequential amendments will be required to the SOP to enable the recommended optimum operating strategy to be realised. The Commission will identify these and make these as a priority once a response from the Government is received.

2.5 Reliance on analysis and information provided by WGM and WaterSecure

Cost information and financial analysis

In the time available, the Commission has not undertaken any investigations or review of the cost information and analysis provided by WaterSecure and the financial analysis undertaken by the WGM, and therefore places reliance on their advice.

Technical risk assessments

The Commission has not undertaken any review of the technical assumptions or risk assessments that underlie the WGM's advice.

3 Background

As noted, the Commission has had access to the WGM's draft advice; and a proposed letter from WaterSecure to Responsible Ministers. The Commission has provided input to the WGM and WaterSecure through a number of meetings.

3.1 Water Grid Manager (WGM) Advice

As explained in the WGM Report, the WGM has collected information from WaterSecure, undertaken analysis of options and made recommendations on:

- the operation of the SEQ (Gold Coast) Desalination Facility at Tugun (desalination facility); and
- the operation of the WCRWS, including the utilisation of the AWTPs at Bundamba, Gibson Island and Luggage Point.

These facilities together are termed *manufactured water facilities*.

The WGM's recommended operating strategy is set out in Section 8 of the WGM's Report.

The Commission's report provides an assessment of the WGM's advice regarding the optimal operating arrangements.

3.2 WaterSecure Advice

The Commission is satisfied that WaterSecure has worked closely and cooperatively with the WGM to provide detailed information to support evaluation of the operating options. As noted, the Commission has been provided with a proposed letter from WaterSecure to Responsible Ministers, but has not been supplied with any other detailed information.

4. The Commission's approach to assessment of the WGM's advice

The Commission has reviewed the WGM's proposals for how they meet the risk criteria in the SOP over the next five years, but has primarily focused on how the proposed operating strategy affects water security and the economically efficient management and use of assets (and therefore on water prices paid by consumers) in the long term. The Commission's recommendations will also contribute to achieving water quality outcomes.

4.1 Time Horizons

The Commission considers the proposed operating strategy has both short/medium term and long term implications for water security. This section summarises the roles and responsibilities for how water security is defined, assessed and managed over these different time horizons and how the advice to Government has been developed.

Level of Service

The *South East Queensland Water Strategy* stipulates a set of LoS objectives as a basis for establishing long term security of water supply. These objectives are defined as the:

- desirable maximum frequency, duration and severity of water restrictions; and
- the average amount of water per person that must be supplied in normal times.

These objectives are used to determine the LoS Yield.

Short to Medium Term – Next five years (Supply Availability)¹

The Commission is responsible for making the SOP which establishes the framework for the operation of the Water Grid by the WGM so as to achieve the LoS in the short to medium term. The WGM submits an Operating Strategy to the Commission for approval.

Section 7 of the SOP sets out *risk criteria* based on the probability of reaching specified storage volumes over a five year period. The WGM has taken the *risk criteria* into account in developing its advice.

The Commission's approach has been to independently assess the WGM's proposals in terms of compliance with the *risk criteria*. The outcome of this assessment is discussed in Section 5.

Long Term - Beyond five years (Supply Capacity)²

The Commission is responsible for advising the Government on achieving the LoS which represent long term security. The Regional Water Security Program for SEQ is made by the Minister for Natural Resources, Mines and Energy and the Minister for Trade drawing on the Commission's advice.

¹ Supply Availability is the total volume presently available to use and relates to the dam levels and operational constraints.

² Supply Capacity is the total volume the Water Grid sources are capable of producing.

Through the SOP, the Commission requires the WGM to consider the impact of any proposed operating strategy on achieving the LOS objectives. However, for this activity, the Commission has undertaken this assessment directly.

The Commission's approach has been to identify relevant long term strategic issues. The Commission's recommendations are aimed at mitigating long term risks that arise with the proposed operating strategy in order to ensure the achievement of water security and economically efficient outcomes in the long term. The outcome of this assessment is discussed in Section 6.

4.2 Reliance on information and analysis provided by WGM and WaterSecure

Efficient and cost effective operation

Rule 8.1 of the SOP requires the WGM to optimise the efficient and cost effective operation of water supply works to deliver the required volume of water. In developing its advice, the WGM has sought detailed information from WaterSecure and has undertaken financial analysis based on this information.

In the time available, the Commission has not undertaken any investigations or review of the cost information and financial analysis and therefore places reliance on the advice of WaterSecure and the WGM.

Technical risk assessments

The WGM's advice is based on a number of technical assumptions which are subject to risk. For example, the WGM notes (Section 8.2 of its advice) that mothballing a large AWTP is technically feasible although there is very limited experience in doing so and no examples of remobilisation. It is noted that there are risks of unanticipated issues that may prevent remobilisation within the allowed time frames.

The Commission has not undertaken any review of the specific technical assumptions and risk assessments.

Expert Advisory Panel for Purified Recycled Water

Appropriately, at this stage, the Commission has not yet consulted the Expert Advisory Panel on PRW in regards to the proposed operating strategy. This involvement will be done following receipt of the Government's decision. The Commission proposes to seek the Expert Panel's input in developing the proposed *Manufactured Water Readiness Risk Management Plan*.

5. Commission Assessment - Next Five Years

The Commission has undertaken the following assessments:

- forecast probability of reaching various key storage levels over the next 5 years; and
- determination under what circumstances the key storages could potentially fall to 40% capacity over the next 5 years. This assessment indicates the potential water security risks of the operating options for manufactured water.

The Commission's assessment indicates that over the next five years there is a very low chance (0.1% probability) that PRW will be required to be added to Wivenhoe Dam in response to a drought.

The WGM has proposed to:

- operate one AWTP plant at the mouth of the Brisbane River (either Gibson Island or Luggage Point) and one of the AWTPs at Bundamba, and
- maintain the desalination facility on "stand-by ready" mode, but to only operate it when required or when the dam levels drop below 60%.

The Commission considers that the WGM's recommended operating strategy meets the risk criteria set out in the SOP. Using worst historical inflows, modelling shows there is at least 2.5 years before desalination is required.

Details of modelling undertaken by the Commission are set out in **Annexure 1**.

6. Commission Assessment - Long term

The Commission has undertaken the following assessments (presented in further detail below):

- a strategic risk assessment of the potential impact of the proposed operating strategy on achieving the LoS objectives in the long term; and
- qualitative assessment of the strategic value of the Manufactured Water facilities to the SEQ Water Grid.

6.1 Strategic risk assessment

This section sets out a strategic risk assessment of the potential impact of the proposed operating strategy on the capacity of the system to achieve the LoS objectives in the long term. This assessment deals with the absolute capacity of all sources currently available.

The actual use and level in the storages are dealt with through the 5 year Risk Criteria assessment in the SOP (short term assessment – see Section 5 above). The average annual water production in 2009 was about 290,000 ML. Based on the daily average production since 1 December 2009, it is expected that the present production rate is about 280,000 ML/a, reflecting the current residential daily use of about 160 litres/person/day.

The LOS yield is the volume of water that can be taken from the Water Grid and still achieve the security criteria, as defined by the level of service objectives. The LOS Yield is used, along with the projected demands, to ensure that adequate initiatives are in place to manage the supply - demand balance in the future.

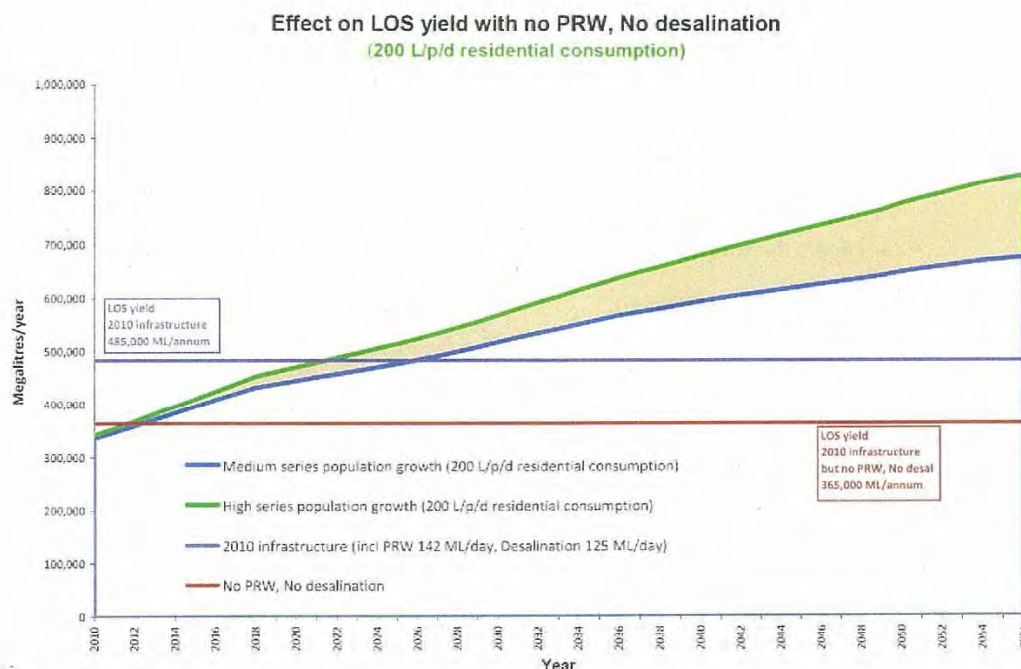
The LOS Yield for the 2010 infrastructure is assessed to be 485,000 ML/a. This assumes that the desalination plant is providing 125 ML/day and PRW at 142 ML/day. If the manufactured water was to be permanently decommissioned, the LOS yield would be reduced to 365,000 ML/a.

The Commission analysis supports the recommended operating strategy. The AWTPs and the desalination facilities should be maintained on a “stand-by” mode, ready for production if required, as the LOS could be impacted in about 2 years’ time (2012) if residential water use rebounds to 200 litres/person/day. This is demonstrated in Figure 1.

This analysis demonstrates that the AWTPs and the desalination facility are necessary to ensure that water security is maintained in the region over the long term. If any of these assets are permanently decommissioned, then alternative infrastructure would need to be constructed as a replacement some time in the future.

Details of the modelling results are provided in the Hydrological Risk Assessment Report in **Annexure 1**.

Figure 1



6.2 Strategic Value of desalination facility and AWTPs

The Commission considers that the strategic value of the desalination facility, as a drought response, is well understood.

However, the Commission is concerned that there is not such clear recognition that the mothballed AWTPs are also valuable long term assets. This perspective should inform their ongoing oversight and management by the various Queensland Government entities.

Notwithstanding that some of the AWTP capacity is proposed to be de-mobilised, these assets provide the following benefits:

- long term “insurance” to the SEQ Water Grid (if the AWTPs were not available, then in due course other assets would be required at significant cost);
- availability that contributes to deferral of the next major source of supply to meet demand growth;
- ongoing opportunity to meet demand from customers that can utilise PRW; and
- arguably having an “option value” as a permanent supply source in the event that future Government policy changes to allow unrestricted utilisation of PRW to supplement potable water supplies.

The Commission considers there is a latent risk that the AWTPs could be “passively” decommissioned over time as a result of inadequate care and maintenance and/or risk management, if this strategic value is not fully recognised.

6.3 Criticality of assumptions on AWTP and desalination facility availability

Section 6.2 highlights the reliance placed on the assumptions that the output from the mothballed AWTPs and the desalination facility is in fact available when required. The Commission undertook an analysis of factors that could lead to these assumptions not being valid. This analysis highlighted the following risks (discussed below):

- Policy consistency risk; and
- Manufactured water readiness risk.

6.4 Policy Consistency

Current Government policy is that PRW from the AWTPs will be added to Wivenhoe Dam when the combined storages in SEQ fall to 40 per cent. The Commission notes that the use of PRW for potable purposes has been debated extensively in recent years. This community debate has informed Government's current policy. With storages now full, it will be at least five years, (and most likely, many more years) before the SEQ community could be faced with the prospect of using PRW for potable water supply.

The Commission considers there is a significant risk that when the time comes to implement Government policy to utilise PRW during a prolonged drought, that there may be insufficient community support leading a Government to reverse its policy on utilisation of PRW.

At worst, this may leave too little time to implement alternative measures, or lead to implementation of high cost emergency supply options.

If the availability of AWTPs and the desalination facility cannot be relied upon when required, then this will place the ability to achieve the LoS beyond 2012 (for a worst case scenario) at material risk.

Therefore, the Commission recommends that the Government consider an appropriate *Communication Strategy* when the new operating strategy is announced to encourage community understanding that future water security depends on:

- certainty as to the ongoing availability of the desalination facility and
- certainty that utilisation of PRW will be allowed as an emergency source of supply

and, if not, that some alternative source of supply would be required.

6.5 Manufactured Water Readiness Risk

The WGM, WaterSecure and the Commission analyses have identified that there are a number of risks to the ongoing readiness from the desalination facility and mothballed AWTPs that may delay or prevent their ability to provide water. The WGM Report (sections 8.1 and 8.2) discusses these risks in detail.

The Commission considers these risks can be classified as:

- Technical Risks
- Capability Risks

- Regulatory Risks.

Technical Risks

Technical risks and their implications include:

- risks of increased costs or delay arising from unanticipated technical issues during remobilisation;
- risks of cost premiums or delay arising from avoidable major renewals expenditure being required prior to recommencing supply; and
- inability to meet customer water quality requirements.

Technical Risks are generally managed through active asset management programs, monitoring and research.

Capability Risks

Capability risks and their implications include:

- loss of operational, technical knowledge and capacity to operate;
- loss of skills in contract management;
- lack of financial capacity to fund required ongoing expenditures;
- loss of research and development capacity;
- inability to maintain necessary management and governance capability; and
- loss of focus on source control.

Capability Risks are generally managed through appropriate organisational, governance and financial capacity.

Regulatory Risks

Regulatory risks and their implications include the costs or delays arising from impediments to achieving Recycled Water Management Plan approvals.

Regulatory Risks are managed through ensuring required regulatory approvals and consents will continue to be available.

6.6 “Institutionalising” Manufactured Water Readiness

The Commission proposes management of these risks thorough “institutionalising” *Manufactured Water Readiness* as a regular business-as-usual process. Specifically, the Commission proposes a *Manufactured Water Readiness Risk Management Plan* be required to ensure effective management of the Technical, Capacity and Regulatory Risks. This plan would be reflected in future updates of the *South East Queensland Water Strategy*.

Subject to further analysis, it is envisaged that aspects of the *Manufactured Water Readiness Risk Management Plan* would be enacted through:

- amendments to the SOP which would establish appropriate obligations and reporting arrangements for the WGM and WaterSecure;

- possible amendments to the Market Rules and Contracts;
- regional drought management plans; and
- annual reporting by the Commission.

One of the “core business” activities for WaterSecure for many years in the future will be to ensure appropriate care and maintenance of the mothballed AWTPs and to maintain the desalination facility in standby. It is important that WaterSecure maintains appropriate organisational, governance and financial capacity. The Government could therefore take account of the *Manufactured Water Readiness Risk Management Plan* in carrying out governance oversight of WaterSecure (for example appointment of the Board, review of financial performance, etc.).

The Economic Regulator will determine expenditure allowances including for WaterSecure to maintain readiness of its manufactured water facilities. Effective Economic Regulation is assisted by clear performance requirements. The *Manufactured Water Readiness Risk Management Plan* should be taken into account in establishing the framework for Economic Regulation.

The Commission considers that if *Manufactured Water Readiness* is not institutionalised in the way proposed, then there is material risk that attention could “drift”, leading to the risks that Manufactured Water is not available when needed.

7 Consequential amendments to the System Operating Plan

A number of consequential amendments will be required to the SOP to enable the recommended operating strategy to be realised. The Commission will identify these and make appropriate amendments once a response is received from the Government to this advice.

7.1 Rule 8.4

As a priority, it is expected that Rule 8.4, requiring the desalination plant provide at least one-third (44 ML/day) capacity could be removed or amended to a “stand-by” operating mode when the key storage volumes are above 60% capacity.

7.2 Rule 8.2

In order to guarantee PRW to be available in compliance with Rule 8.2 of the SOP (i.e. when key storage levels reach 40%) it would be necessary to commence AWTP remobilisation some time in advance of reaching this level.

There may be a need to modify this rule to facilitate optimal operating arrangements. The Commission proposes to investigate, with the WGM and WaterSecure, options to modify the trigger definition to optimally balance cost minimisation (cost deferral) and water security objectives.

Similarly, analysis would need to be conducted to determine when demobilisation would occur again.



Annexure 1

Hydrologic Risk Assessment – Scenarios for Operation of Manufactured Water

November 2010

Version 2

Document Control

Date	Author	Description	Version
29/10/2010	Wai-Tong Wong and Wendy Auton	Draft - hardcopy provided to Water Grid Manager and WaterSecure through Karen Waldman	1
2/11/2010		Draft – revised with 5 years inflow run added	2

Approval

Date	Name	Description	Version
29/10/2010	Tad Bagdon	Draft - hardcopy provided to Water Grid Manager and WaterSecure through Karen Waldman	1
12/11/2010	Tad Bagdon Karen Waldman	Final	2

Executive Summary

The purpose of this report is to provide an assessment of the operating strategies proposed by the SEQ Water Grid Manager.

The outcomes of this assessment are:

1. Given the current full (or near) supply in the SEQ storages, any of the following options to operate the advanced water treatment plant is assessed to satisfy the short term (drought) security of supply under the SEQ Water Strategy, by using:
 - a. either plant at Gibson Island or Luggage Point, and half a plant at Bundamba , or
 - b. any one of the above advanced water treatment plant.
2. The proposal to operate the desalination plant on "stand-by" mode and ready for full production over the next two years is acceptable. Based on the results, there is at least 2.5 years before desalination is required. This "stand-by" operation could be reviewed in 2 years time.
3. The preferred operating mode above meets the short term 5 year risk criteria under the System Operating Plan (SOP).
4. In the short term, the SOP rule (Section 8.4) requiring the desalination plant to provide at least one-third (44 ML/day) capacity could be amended to a "stand-by" operating mode when the key storage volumes is above 60% capacity.
5. There is a 99.9% (or high chance) that the storage will not require PRW into Wivenhoe Dam for at least 5 years (from October 2010).
6. The desalination and/or PRW cannot be decommissioned permanently as this would impact on the long term Level of Service yield stipulated in the SEQ Water Strategy. New infrastructure would otherwise need to be brought forward.
7. If the desalination and PRW are removed completely, the long term LOS yield reduces from 485,000 ML/a to 365,000 ML/a. This is not the case if they are available for recommissioning to bring the LOS yield back to 485,000 ML/a.
8. Depending on the demand, the LOS could be satisfied up to 2012 for the residential water use of 200 litres/person/day. For a lower demand of 180 litres/person/day, the LOS could be met up to 2017.

1 Introduction

On 1 September 2010, the Minister for Natural Resources, Mines and Energy and Minister for Trade wrote to the Commissioner requesting advice on the optimal operating arrangement for the Water Grid in view of the current full storage level in the key SEQ dams.

A similar letter was also written by the Minister for Natural Resources, Mines and Energy and Minister for Trade, and the Treasurer to the chairs of the SEQ Water Grid Manager and WaterSecure on 13 September 2010.

The SEQ Water Grid Manager (WGM) has provided a draft report, "Climate Resilient Supplies – basis for advice regarding demand and operating strategies, November 2010", for assessment by the Commission.

A number of options have been proposed by the WGM for the operation of the desalination plant at Tugun and the advance water treatment plants at Bundamba, Gibson Island and Luggage Point – generally termed as manufactured water.

2 Purpose of Report

The purpose of this report is to provide an assessment of the operating strategies proposed by the WGM.

Specifically, the report will assess the following issues for the preferred/proposed option:

- a) forecast the probability of key storages level over the next 5 years (using Wathnet Model)
- b) ascertain the short term security of supply to meet System Operating Plan (using Wathnet Model)
- c) determine when the key storages may reach 40% capacity for two inflow scenarios (using Waspp Model)
- d) assess the potential impact on the Level of Service Yield in the long term (using Wathnet Model)

3 Forecast the probability of key storages level over the next 5 years

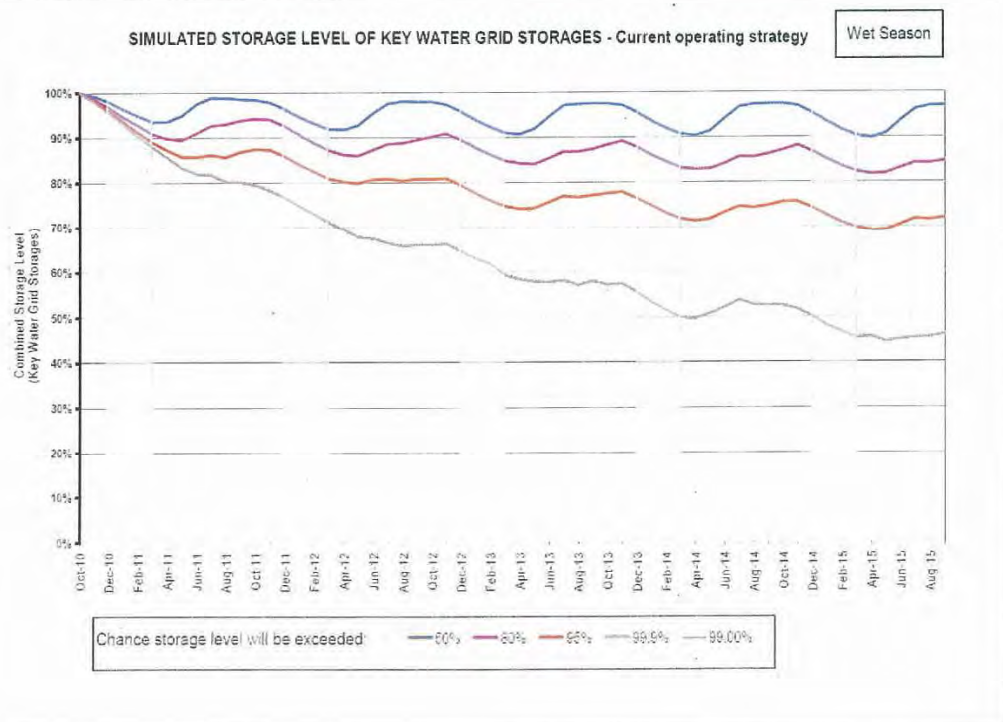
To forecast the probability of the combined storage reaching a certain level, the Wathnet Model³ was used, based on stochastic data generation for 117 years of historical information.

For the May 2010 operating strategy, the key assumptions are:

- Storage begins at 100% full (current condition)
- Residential demand of 200 litres/per/day
- High series population growth
- Desalination supplied at 44 ML/day (33% capacity) above 40% dam level
- PRW supplied at 170 ML/day when storage drops to 40%.

Figure 1 shows the forecast combined key storage level with the current operating strategy. For example, there is a 99.9% probability that the dam level is above 60% in March 2013. Likewise there is only a 50% probability that the level will remain above 90%.

Figure 1: Current Operating Scenario - forecast combined dam level showing probabilities of exceedance



³ Wathnet Model refers to the Generalised Water Supply Headworks Simulation using Network Linear Programming Model.

To test the effect of the preferred operating scenario, a simulation was carried out based on the following assumption:

- Storage begins at 100% full (current condition)
- Residential demand of 200 litres/per/day
- High series population growth
- Desalination on "stand-by" when combined storage level is above 60%. Below 60%, the full 125 ML/day is produced.
- PRW operating at 40 ML/day when combined storage is above 40% (or one and a half AWTP). The full PRW output of 170 ML/day is used when storage falls below 40%.

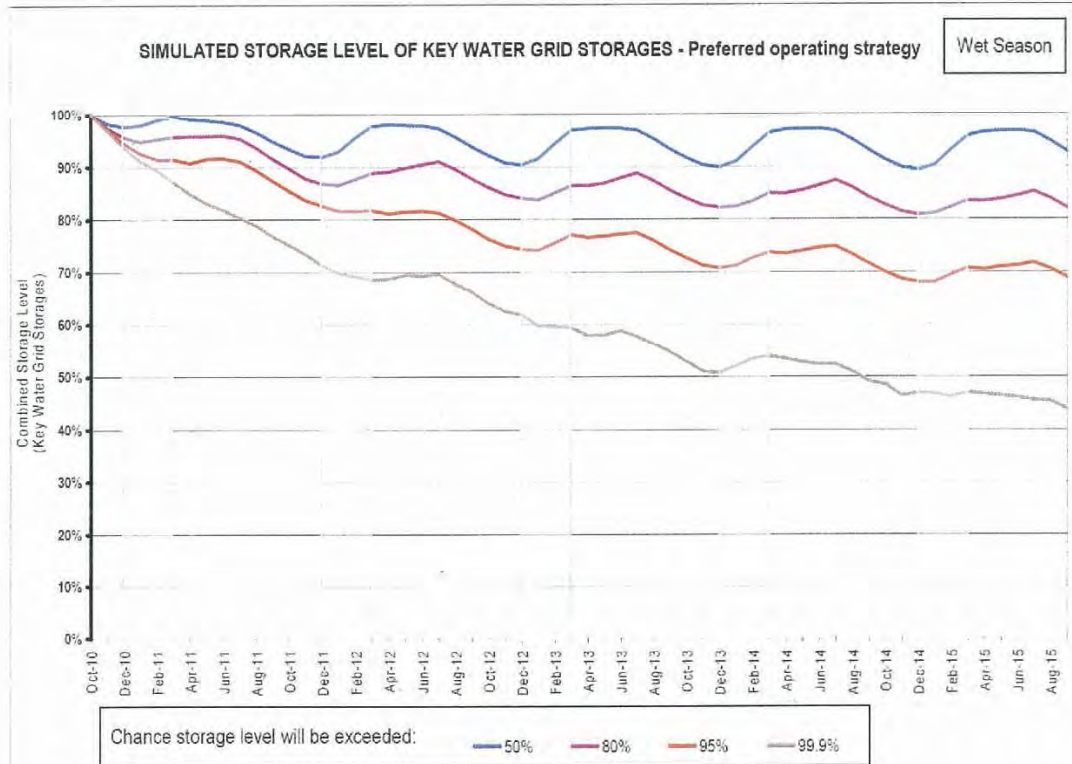
For the purpose of this report, this scenario would represent a high risk scenario with high population and high residential demand. Therefore the actual behaviour is expected to be better.

Figure 2 shows the forecast combined key storage level with the proposed operating strategy. For example, there is a 99.9% probability that the dam level is above 60% in March 2013. Likewise there is only a 50% probability that the level will remain above 90%.

There is very little difference between the two operating scenarios in the behaviour of the key water storages when comparing Figures 1 and 2.

There is a 99.9% (or high chance) that the storage will not require PRW into Wivenhoe Dam for at least 5 years (from October 2010). This is illustrated in Figure 2 where the 99.9% line shows it to be above the 40% storage for the 5 years.

Figure 2: Proposed Operating Scenario - forecast combined dam level showing probabilities of exceedance



4 Short term security of supply to meet System Operating Plan

The System Operating Plan (SOP) Release 3.1 specifies the risk criteria which indicate the probability of reaching specified key storage volumes over a 5 year period (Table 1).

Table 1: SOP Risk Criteria SOP criteria

Capacity of Key Water Grid Storages	Probability of reaching Capacity of Key Water Grid Storages			
	Within 1 year	Within 3 years	Within 5 years	Within 10 years
40%	Less than 0.2%	Not specified	Less than 5%	Not applicable
30%	Not specified	Less than 0.5%	Less than 1%	Not applicable

Based on the Wathnet Model runs as specified in Section 3, the results for the two scenarios i.e. current and proposed scenarios are shown in Tables 2 and 3 respectively.

Table 2: Current operating strategy

Capacity of Key Water Grid Storages	Probability of reaching Capacity of Key Water Grid Storages			
	Within 1 year	Within 3 years	Within 5 years	Within 10 years
40%	Less than 0.1%	Not specified	Less than 0.1%	1.67%
30%	Not specified	Less than 0.1%	Less than 0.1%	0.26%

Table 3: Proposed operating strategy

Capacity of Key Water Grid Storages	Probability of reaching Capacity of Key Water Grid Storages			
	Within 1 year	Within 3 years	Within 5 years	Within 10 years
40%	Less than 0.1%	Not specified	Less than 0.1%	1.56%
30%	Not specified	Less than 0.1%	Less than 0.1%	0.24%

The results indicate that the SOP risk criteria are met by the proposed operating strategy.

5 Assessment when key storage capacity reaches 40% for 2 inflow scenarios (using Waspp Model)

Hydrological modelling using the Waspp (Water Supply Predictive Planning) Model was used to ascertain when the key storages could potentially reach 40% capacity over the next 5 years. This assessment would provide an idea of the risk involved in the operating options for manufactured water.

Two inflow scenarios were selected for the simulations (Table 1):

- Using worst 3 years of inflow sequence into the storages (happened in June 2004 – May 2007). **This flow sequence is assumed to occur from 1 November 2010 and is repeated.**
- Using worst 5 years of inflow sequence into the storages (happened in June 1898 to May 1903– Federation Drought). **This flow sequence is assumed to occur from 1 November 2010 and is repeated.**

Whilst the 3 year minimum inflow sequence provides the “worst case” scenario, the 5 year minimum flow sequence is considered to be more realistic given the current climatic outlook.

Assumptions used in the model simulations are:

- Key SEQ Storages (Grid 12) are now effectively at 100% capacity
- Modelling starts from 31 October 2010
- Medium series population growth
- Desalination provides 125 ML/day when key SEQ Storages reaches 60%
- 25 ML/day currently being transferred from Gold Coast to Brisbane. When the key SEQ Storages reaches above 60%, then 95 ML/day is transferred from the Gold Coast
- Residential water consumption of 180 litres/person/day (likely average water use)

Table 1: Simulation Cases and Time to Reach 40% Storage

Case	Minimum Inflow Sequence	Desalination* (ML/day)	PRW (ML/day)	Time to Reach 40% Capacity (Forecast)		Comments
				Date	Time (from 31 Oct 2010)	
1	3 years	44	20	July 2015	4 years 9 months	Desalination at 33% capacity, PRW at 20 ML/day
2	3 years	0	0	May 2015	4 years 7 months	No desalination when storage is above 60%. No PRW added when storage is above 40%.
3	3 years	0	40	July 2015	4 years 9 months	20 ML/day at Bundamba, 20 ML/day at Luggage Point or Gibson Is. Desalination 0% (hot start)
4	3 years	14	20	July 2015	4 years 9 months	Desalination at 11% (one work shift), Gibson Is or Luggage Point producing total 20 ML/day
5	5 years	0	20	Greater than Aug 2015	At least 5 years	No desalination when storage is above 60%. Only one PRW plant operating at 20 ML/day.

* Desalination output is indicated in the Table above, but will be operated at 125 ML/day when the key storages drop below 60% for all cases.

Results of Simulations

Figure 3 – shows the combined storage levels for all 12 key SEQ Storages.

Comparing the same 3 year minimum inflow sequence (Cases 1-4), there is little variation between the various cases of varying the operation of the desalination and/or PRW

Hence the adoption of any of the options proposed is similar in the hydrological risk, and decision on it could be based on other consideration such as economics.

There is at least 2 years and 6 months (from October 2010) before the combined storages reach 60% for desalination to be required – based on a 3 year minimum inflow sequence to occur over the next 3 years. This is considered to be a conservative assumption given the current meteorological forecast for a high probability of above median rainfall in SEQ in spring and summer. However this provides a low risk scenario.

With Case 4, using the 5 year minimum inflow sequence, the combined storage volume is higher than the 3 year minimum inflow. This is expected as the five year sequence is a less severe drought than the 3 year sequence, and there were some minor inflows occurring over the 5 year period. In fact there was a small inflow in the May/June period (Case 4). As a reality check, some inflows do occur for the Somerset/North Pine/Wivenhoe system in June – this happened as recent in May/June 2009 when these 3 storages experienced an increase in volume by about 25%.

Figure 4 – shows the combined storage levels for Wivenhoe/Somerset/North Pine dams.

Little variation is observed in the plot (above 60% combine storage) as compared to Figure 3 as these 3 dams represent a large proportion (85%) of the total 12 Storages.

Figure 5 – shows the combined storage levels at Hinze and Little Nerang dams.

The impact shown by the change in water level is more pronounced for such smaller dams (as compared to Wivenhoe) due to local demand and also a transfer of 25 ML/day to Brisbane, along with inflows.

For the 3 year inflow sequence (Cases 1-4), the full desalination of 125 ML/day commences in April 2013 when the combined key SEQ Storages drops to 60% regardless of the cases simulated, resulting in an increase in water level followed by a drop due to 95 ML/day of supply provided to Brisbane.

However, for the 5 year inflow sequence simulation, the full desalination production of 125 ML/day only occur in April 2014 (about 3.5 year's time), with 95 ML/day being transferred to Brisbane when that happens. This results in an effective gain of only 30 ML/day for the Gold Coast. The storage behaviour for Hinze and Little Nerang Dams (Case 5) continues to drop due to a demand of about 150 ML/day along with almost no inflows into the two dams from April 2014 – March 2015.

6 Assessment of the potential impact on the LOS Yield in the long term - using Wathnet Model

The Regional Water Security Program for SEQ establishes the desired level of service (LOS) objectives which form a basis for the SEQ Water Strategy and are implemented through the System Operating Plan. These objectives provide a long term security of water supply and are defined as the:

- desirable maximum frequency, duration and severity of water restrictions
- the average amount of water per person that must be supplied in normal times.

These objectives are used to determine the Level of Service (LOS) Yield. The LOS Yield is used, along with the projected demands, to ensure that adequate initiatives are in place to meet demand in the future.

The LOS Yield for the 2010 Infrastructure is assessed to be 485,000 ML/a. This assumes that the desalination plant is providing 125 ML/day and PRW at 142 ML/day.

To assess the impact on the long term LOS Yield, the Wathnet Model was used. The current residential demand is about 160 litres/person/day but this is expected to increase as conditions may become drier in future.

For the purpose of planning, two scenarios were tested i.e. 180 and 200 litres/person/day

This assessment was based on the following assumptions:

- 2010 infrastructure, prior to the full operation of Wyaralong Dam and Hinze Dam Stage 3
- PRW production at 52,000 ML/a (142 ML/day) and supplies 34,950 ML/a (96 ML/day) to industry
- Desalination production at 46,000 ML/a (125 ML/day)

Results

The LOS Yield for the 2010 Infrastructure is assessed to be 485,000 ML/a. With the full operation of Wyaralong Dam and Hinze Dam Stage 3, the LOS Yield increases to 545,000 ML/a as shown in the SEQ Water Strategy.

For the purpose of this work, the 2010 LOS Yield was used as a basis for comparison.

Figure 6 (Water Supply Balance – Level of Service Assessment)

- Based on residential demand **180 litres/person/day**, the LOS yield reduces from 485,000 ML/a to 365,000 ML/a with the desalination and the PRW turned off permanently. The demand and supply balance reduces from 2042 to 2017.

This means the PRW and desalination could impact on the LOS of the system in 2017, if no augmentation occurs.

Figure 7 (Water Supply Balance – Level of Service Assessment)

- Based on residential demand **200 litres/person/day**, the LOS Yield reduces from 485,000 ML/a to 365,000 ML/a with the desalination and the PRW turned off permanently. The demand and supply balance reduces from 2026 to 2012 (by 14 years). This means the PRW and desalination should not be turned off permanently, as it would impact on the LOS of the system as early as 2012.

However, the demand is likely to be lower than 200 litres/person/day which would provide some buffer and extend the timeline from 2012.

It would therefore be prudent to keep the desalination plant and PRW on “stand-by” operating mode and ready for full production over the next two years. Based on the results in Section 3, that there is a minimum of 2.5 years before desalination is required, this “stand-by” operation could be reviewed in 2 years time.

7 Conclusions

1. Given the current full (or near) supply in the SEQ storages, any of the following options to operate the advanced water treatment plant is assessed to satisfy the short term (drought) security of supply under the SEQ Water Strategy, by using:
 - a. either plant at Gibson Island or Luggage Point, and half a plant at Bundamba, or
 - b. any one of the above advanced water treatment plant.
2. The proposal to operate the desalination plant on "stand-by" mode and ready for full production over the next two years is acceptable. Based on the results, there is at least 2.5 years before desalination is required. This "stand-by" operation could be reviewed in 2 years time.
3. The preferred operating mode above meets the short term 5 year risk criteria under the System Operating Plan (SOP).
4. In the short term, the SOP rule (Section 8.4) requiring the desalination plant to provide at least one-third (44 ML/day) capacity could be amended to a "stand-by" operating mode when the key storage volumes is above 60% capacity.
5. There is a 99.9% (or high chance) that the storage will not require PRW into Wivenhoe Dam for at least 5 years (from October 2010).
6. The desalination and/or PRW cannot be decommissioned permanently as this would impact on the long term Level of Service yield stipulated in the SEQ Water Strategy. New infrastructure would need to be brought forward otherwise.
7. If the desalination and PRW are removed completely, the long term LOS yield reduces from 485,000 ML/a to 365,000 ML/a. This is not the case as they are available for recommissioning to bring the LOS yield back to 485,000 ML/a.
8. Depending on the demand, the LOS could be satisfied up to 2012 for the residential water use of 200 litres/person/day. For a lower demand of 180 litres/person/day, the LOS could be met up to 2017.

Risk assessment in the short term - based on 3 worst years of inflow sequence and 180 litres/person/day

9. There is, a minimum risk of 4 years and 7 months before the key storages reaches 40 % - based on the worst combination of inflows into the dams.
10. There is only a minor influence of keeping part of the desalination operating and part of the PRW working - only extends the time to reach 40% by about 2 months.
11. There is a period of about 4 years and 7 months (from October 2010) before we need to **add PRW** into Wivenhoe Dam. This is helped by the fact that the key storages are currently at 100% capacity effectively.

12. There is a period of about 2.5 years (from October 2010) before we need to provide **full desalination at 125 ML/day**. This is helped by the fact that the key storages are currently at 100% capacity effectively.

Risk assessment in the short term - based on 5 worst years of inflow sequence and 180 litres/person/day

13. There is a period of at least 5 years (from October 2010) before we need to **add PRW** into Wivenhoe Dam.
14. There is a period of about 3.5 years (from October 2010) before we need to provide **full desalination at 125 ML/day**.

Figure 3

Simulated Storage Levels - combined Key Water Grid storages - for various PRW and desalination cases
(Worst 3 and 5 years inflow sequence and 180 L/p/d residential consumption)

Wet Season

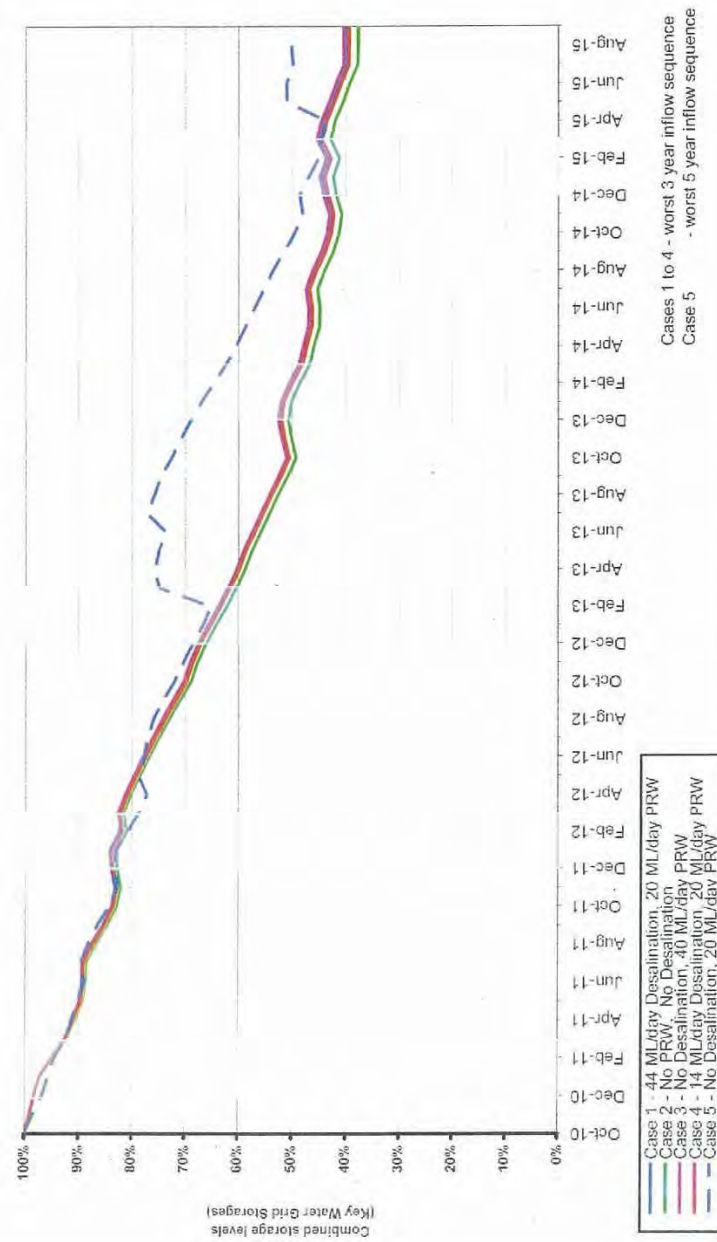


Figure 4

Simulated storage levels - combined Wivenhoe, Somerset and North Pine Dams - for various PRW and desalination cases
(With worst 3 and 5 years inflow sequence and 180 L/p/d residential consumption)

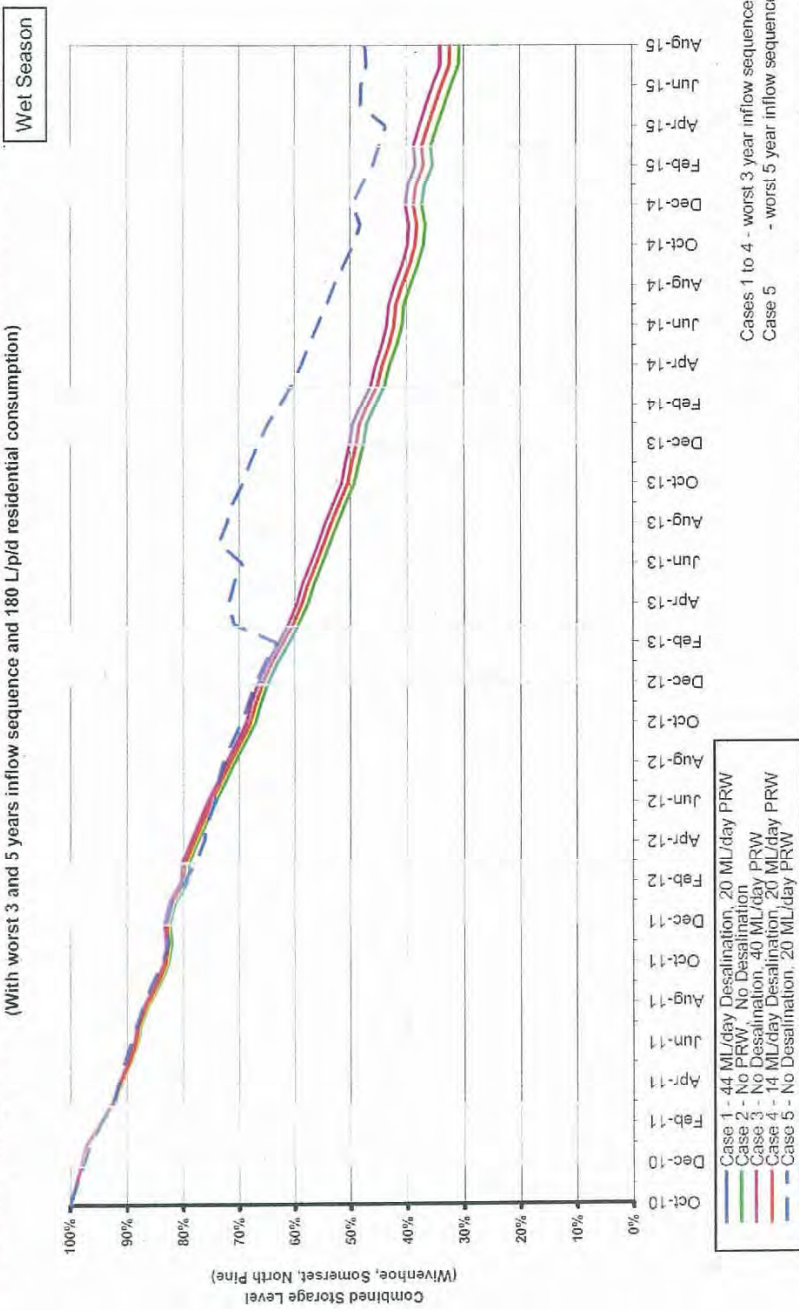


Figure 5

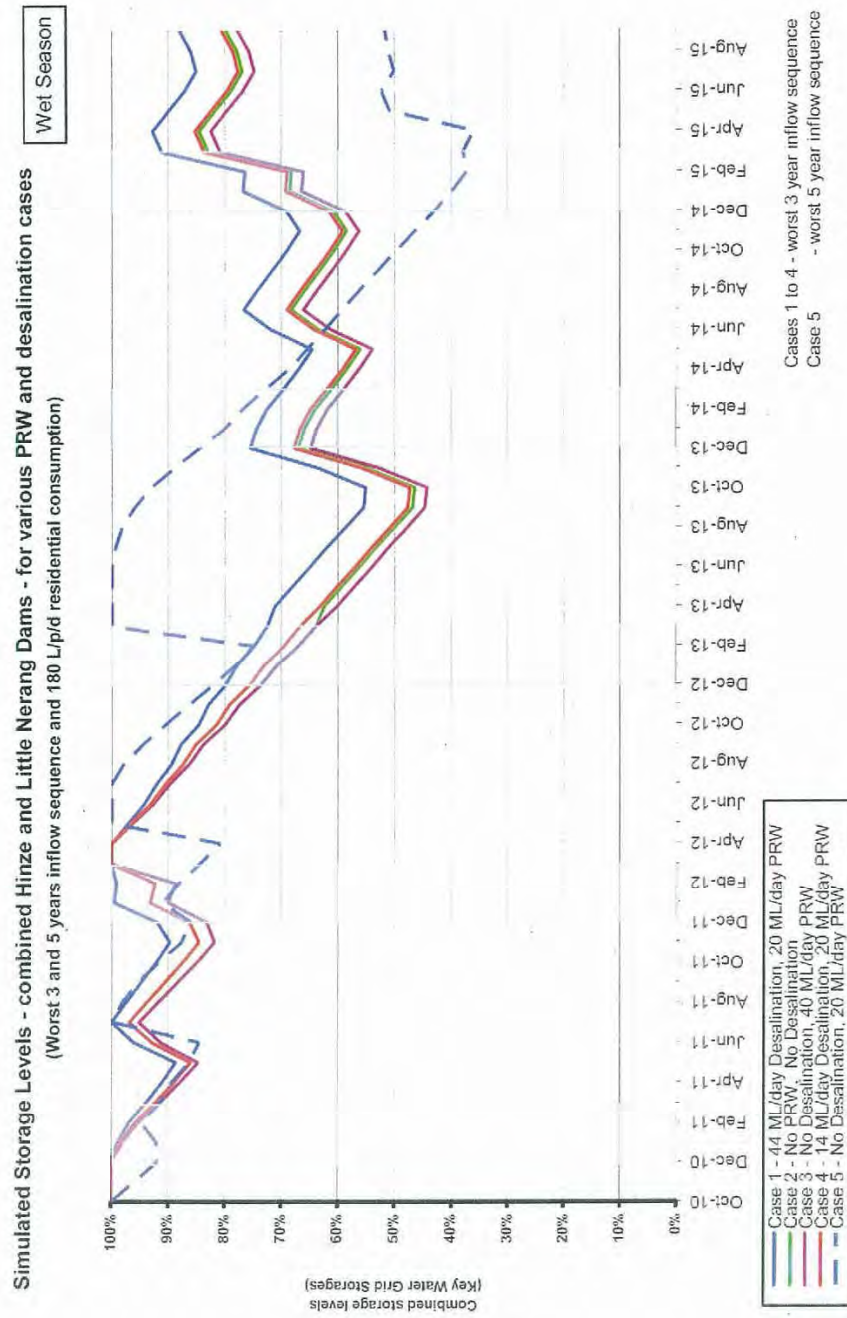


Figure 6

Effect on LOS yield with no PRW or desalination
(180 L/p/d residential consumption)

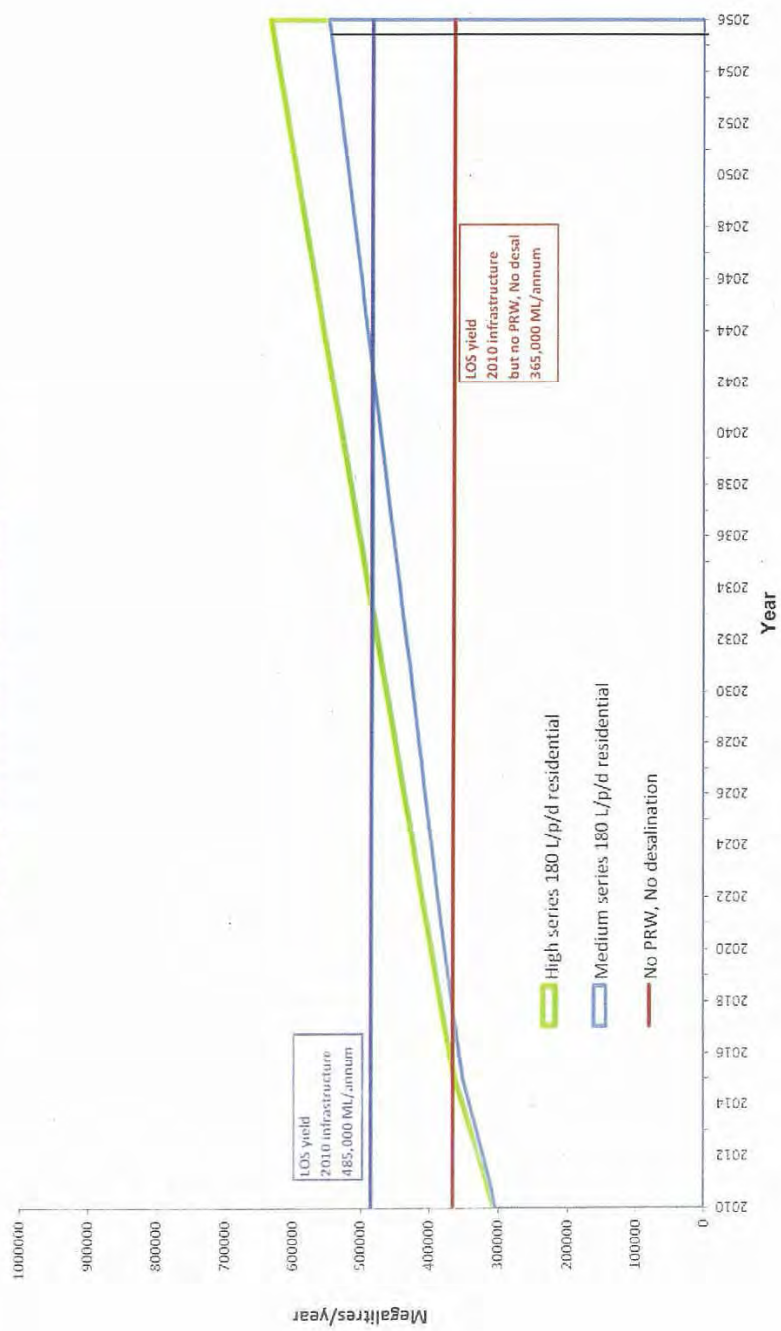
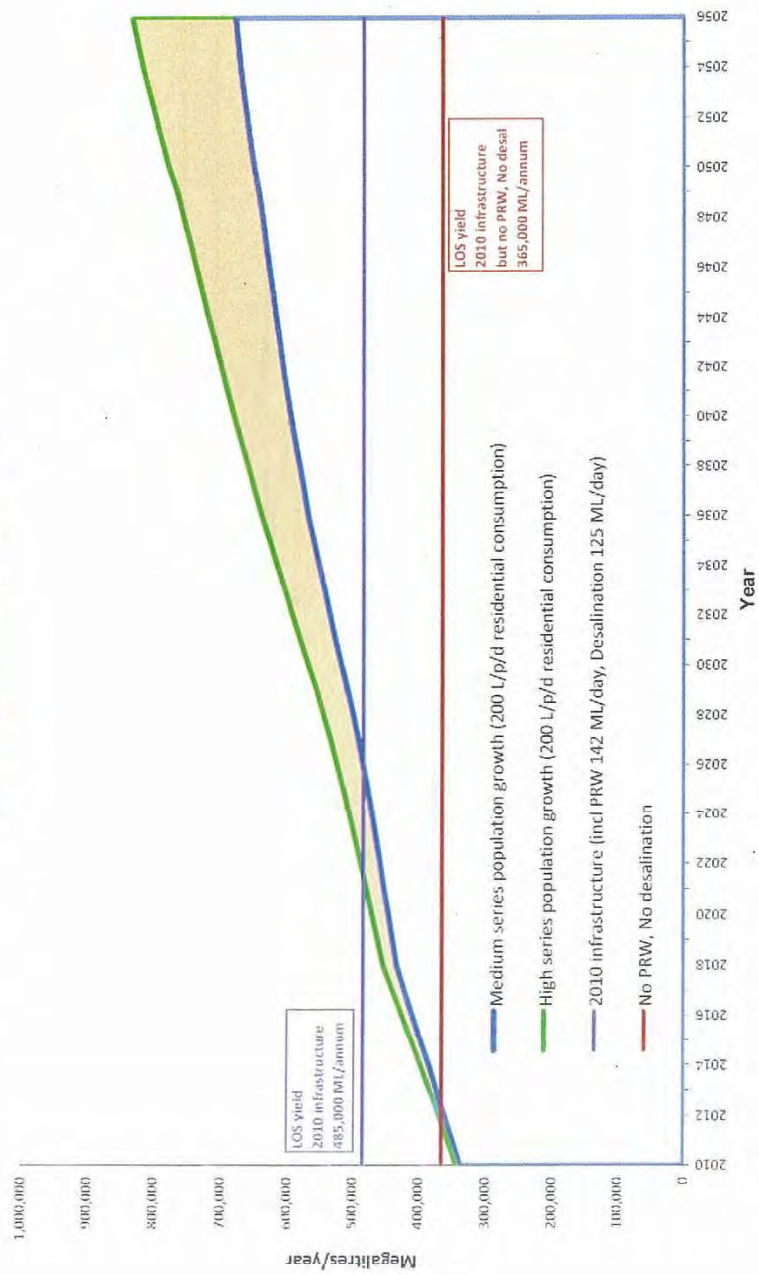


Figure 7

Effect on LOS yield with no PRW, No desalination
(200 L/p/d residential consumption)



D/10/057896

RECEIVED

13 DEC 2010



Hon Stephen Robertson MP
Member for Stretton



Queensland
Government

Ref CTS 21372/10

Minister for Natural Resources,
Mines and Energy and
Minister for Trade

03 DEC 2010

Ms Mary Boydell
Commissioner
Queensland Water Commission
PO Box 15087
CITY EAST QLD 4002

Dear Ms Boydell

We are writing in relation to your advice of 12 November 2010 on the optimal operating strategy for the SEQ Water Grid and particularly in relation to the Gold Coast Desalination Facility and Western Corridor Recycled Water Scheme.

The Treasurer and I thank you for providing us with the results of your detailed analysis. We have noted the recommended operating strategy for the Gold Coast Desalination Facility and Western Corridor Recycled Water Scheme, as proposed by the Water Grid Manager. In particular, we note the proposal to operate the desalination facility in standby from January 2011, and to de-mobilise parts of the Western Corridor Recycled Water Scheme from mid 2011.

In doing so, we have taken into account your advice that this operating strategy meets the requirements under the System Operating Plan. We also note the Commission's intention to amend the System Operating Plan to require the preparation of detailed manufactured water readiness plans to ensure these facilities can supply water, as and when required to ensure long term water security for South East Queensland.

To enable timely implementation of the amended operating strategy, we request that you make this amendment and remove the requirement that the desalination plant be operated at a minimum of one-third of capacity as soon as practicable.

Subject to these changes to the System Operating Plan, the operational decisions are matters for the Water Grid Manager to implement. We expect the timing and program for implementation of the recommended operating strategy to be determined by the Water Grid Manager, in consultation with WaterSecure and the Queensland Water Commission.

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Facsimile +61 7 3225 1828
Email nrmnet@ministerial.qld.gov.au

My office will be responsible for the communication of this and other related decisions, including appropriate timing. However, I have requested that the Water Grid Manager develop a co-ordinated communication strategy for the announcement of the proposed operating strategy, in consultation with WaterSecure and the Queensland Water Commission.

We thank you again for your timely advice on this matter. Please do not hesitate to contact Mr John Bradley, Director-General on telephone [REDACTED] or email [REDACTED] should you have any queries or require any further information.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Stephen Robertson', with a stylized flourish at the end.

STEPHEN ROBERTSON MP

Our ref: ME/10/0755

24 December 2010

The Honourable Stephen Robertson MP
Minister for Natural Resources, Mines and Energy
and Minister for Trade
PO Box 15216
CITY EAST QLD 4002

Dear Minister

Thank you for your letter of 3 December 2010 regarding the Queensland Water Commission's (Commission) advice on the optimal operating strategy for the South East Queensland (SEQ) Water Grid.

As a result of the Queensland Government's recent decision to operate the SEQ (Gold Coast) Desalination Facility on standby mode and to demobilise parts of the Western Corridor Recycled Water Scheme, the Commission will amend the South East Queensland System Operating Plan in January 2011 to remove the requirement that the desalination plant be operated at a minimum of one-third of capacity.

In January 2011 the Commission will develop a process for the preparation of a Manufactured Water Readiness Risk Management Plan to ensure these facilities can supply water as and when required. This process will be carried out in consultation with WaterSecure, Seqwater and the SEQ Water Grid Manager.

If you require any further information, please contact Ms Karen Waldman, Chief Executive Officer of the Commission on [REDACTED]

Yours sincerely

[REDACTED]

Mary Boydell
Commissioner

Allan Julie

Subject: FW: Framework for Planning and delivery of water infrastructure in SEQ
Location: Conference Room 1, Level 16, 53 Albert Street Brisbane

Start: Tue 12/10/2010 1:30 PM
End: Tue 12/10/2010 4:30 PM

Recurrence: (none)

Meeting Status: Accepted

From: Martin Amy (QWC) **On Behalf Of** Waldman Karen
Sent: Tuesday, 28 September 2010 5:13 PM
To: Waldman Karen; [REDACTED]
[REDACTED]; Dennien Barry; Leaver Gayle; Waldock Tracie-Lee; Bagdon Tad; Wong Wai Tong; 'Allan Julie'; [REDACTED]
Cc: Karve Supriya
Subject: Framework for Planning and delivery of water infrastructure in SEQ
When: Tuesday, 12 October 2010 1:30 PM-4:30 PM (GMT+10:00) Brisbane.
Where: Conference Room 1, Level 16, 53 Albert Street Brisbane

Background

The Commission is currently undertaking a project to ensure there is clarity and understanding of how the bulk and retail water businesses, Water Grid Manager and QWC will undertake their roles for planning and delivery of water infrastructure in SEQ. There is a need to ensure adequate process and role clarity to enable all parties to meet their obligations and allow the water businesses to move forward both in the short and long term. The project also aims to improve understanding of the relationships between water businesses, regulators and government agencies.

This phase of the project specifically aims to identify the issues to be resolved and their priorities.

Purpose

The QWC invite you to attend a presentation and meeting with the aims of:

- Providing you with an update on the planning framework;
- Seeking input on the framework including issues and priorities.
- Agreeing on a program of further consultation to support the project.

In preparation for the meeting you may wish to consider what needs exist for process clarity for your organisation, to ensure it can meet its obligations and move forward – both in the short term (pre 2013) and in the long term (post 2013).

You are welcome to nominate other attendees from your organisation.

If you have any questions regarding the workshop please contact Mr Steve Ward, Water Reform, Queensland Water Commission on telephone number [REDACTED]

Please RSVP your attendance by return email to Ms Supriya Karve on telephone number [REDACTED] or by email [REDACTED] by 8 October 2010

Regards

Karen Waldman

Chief Executive Officer | Queensland Water Commission

[REDACTED]

[REDACTED]

Opportunity { Outline, succinctly
of WGM picture.
Geoff
"despatch" profile
to Spec.

Journey together
Shared storybook.
Whole of system
Whole of life

Long Term Framework for Planning & Delivery of Water Infrastructure for the SEQ Water Grid

Discussions with SEQ WGM
5 October 2010



Agenda

1. Introduction
2. Framework for planning
3. Issues
4. Next steps



2

Optimised

Medium long term

1

1. Introduction



Background

- There appears to be some lack of clarity and understanding as to:
 - how water businesses, WGM and QWC will undertake certain aspects of their individual roles for planning and delivery;
 - how certain of the relationships between water businesses and regulators and departments will work.
- Also, there are a number of issues to be resolved.
- QWC considers it valuable to meet with stakeholders to improve understanding of the current planning and delivery arrangements, the issues to be resolved and priorities.



Purpose of presentation

- Assist the water businesses to better understand and prepare their internal planning processes
 - Now (2010 to 2013)
 - Post 2013
- By ...
 - Confirming and clarifying what is known about the planning framework, including what can be reasonably expected as the framework for economic regulation develops;
 - Identifying key issues that are currently unclear.

5



Context

- There are many parties with responsibility for regulation, planning and delivery of water services in SEQ.
- Different organisations have different drivers, regulatory contexts and planning frameworks depending on their roles.
- This framework is focussed on planning and delivery of infrastructure to achieve outcomes as defined by legislation, contracts etc.
- Infrastructure solutions must always prove themselves against non-infrastructure solutions to proceed to delivery

6



Scope of planning and delivery framework for water infrastructure in SEQ

- Ultimate (Post 2013):
 - All infrastructure. Driven by- growth, usage, compliance, renewals, efficiency, drought. To achieve security and sufficiency of supply.
 - Applies to parties with planning roles:
 - QWC
 - GSPs (Seqwater, Linkwater, WaterSecure)
 - SEQ Water Grid Manager
 - DRs (Allconnex, Unitywater, Qld Urban Utilities)
 - Takes account of roles of QCA, DERM and other parties with regulatory and advisory responsibilities.
- Interim Arrangements (2010-2013)

7

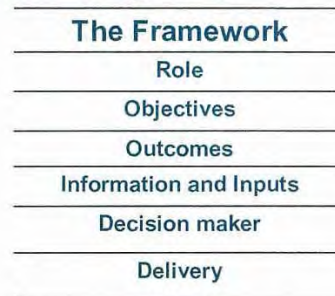


1. Framework for planning



A framework for planning

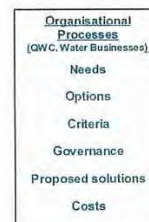
- The framework for planning and delivery can be described and organised in different ways.
- QWC considers this framework provides a useful way to systematically describe how planning and delivery is undertaken for each organisation ...



9



A framework for planning



10



Application of the framework

- The following slides show how this framework can be applied for ...
 - QWC
 - DRs (Allconnex, Unitywater, Qld Urban Utilities)
 - GSPs (Seqwater, Linkwater, WaterSecure)
 - SEQ Water Grid Manager

and

-the status of aspects that are in the process of being resolved

11



Application of the framework

	A. QWC	B. DRs	C. GSPs	D. SEQWGM
Role				
Objectives				
Outcomes				
Information and Inputs				
Decision maker				
Delivery				

Aspects that are being resolved are shaded

12



A. QWC – planning and delivery framework

Role	- To provide advice to the Minister on water supply and demand management and the delivery of desired level of service objectives for the region. - Facilitate and implement the regional water security program. <i>Make and administer the system operating plan (SOP), act as the Market Rules Administrator, make water restrictions when required. Ensure compliance with programs and restrictions.</i>
Objectives	Ensure the delivery of sustainable and secure water supply and demand management for SEQ.
Outcomes	- Advice on new regionally significant infrastructure to provide sufficient quantity, quality and reliability of water to achieve the level of service (LOS) objectives. - Timely delivery of appropriate infrastructure. - Collaborative planning integrated with total water cycle management outcomes, that provides opportunities for innovation.
Information and inputs	- SEQ Regional Plan, Regional Water Security Program for SEQ (LOS, portfolio), policy, asset capability, growth patterns, demand patterns, solution options, models, cost data etc. - QWC is seeking to improve its planning process to be more appropriate for 'normal' times as distinct from the responsive approach during the water emergency.
Decision Maker	Minister makes regional water security program including LOS, infrastructure to achieve it and cost/price arrangements.
Delivery	Existing financial and procurement processes.

13



QWC – aspect affecting planning and delivery that are in the process of being resolved

- “Normal” planning processes

14



QWC - Improved planning processes (post drought)

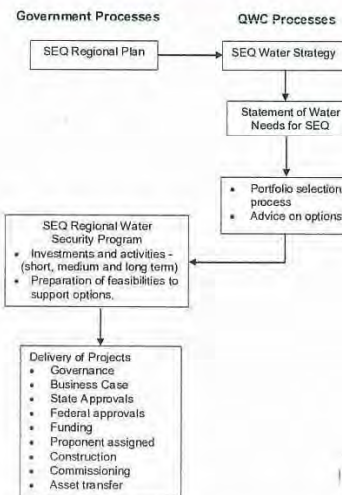
- QWC considers the process should be open, inclusive and adaptive to new information over time.
- Requires separation of needs analysis and solution identification.
- Regionally significant infrastructure - to achieve security outcomes (level of service objectives), efficiently.
 - Planned system augmentations
 - Drought Response Plan
- Predominantly affects GSPs infrastructure
- Test processes against real examples

15



QWC - Proposed planning process (post drought)

- QWC process to support the preparation of advice to the Minister.
- Follows from Strategy and water balance.
- SOWN aims to identify needs with a focus on water security (LOS) and regionally significant infrastructure.
- Options (infrastructure and non-infrastructure) will be sought from appropriate parties to satisfy needs.
- Best suite of options will be the basis of the preferred portfolio.



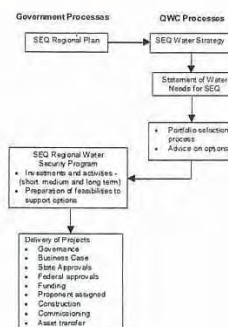
16



QWC - Proposed planning process (post drought)

Issues QWC is considering, include:

- How to manage inputs to SOWN.
- What are the policy and statutory implications of seeking private sector input into the process (options identification and review)?
- Criteria for assessment.
- Drought response component of planning.
- Are there appropriate legal powers/funding arrangements for the Commission to undertake detailed enquiries to support robust, high quality portfolio identification in advance of an approved RWSP?



17



B. Distribution Retailers (DRs) – planning and delivery framework

Role	Operate and invest to provide urban water distribution and retail services, and waste water and trade waste services. Other services may include delivery of recycled water.
Objectives	Deliver services efficiently to meet customer requirements and in accordance with regulatory obligations. Operate commercially.
Outcomes	Meet customer service standards (pressure, reliability, water quality – human health, aesthetic, odour, overflows etc). Meet retail service standards.
Information and inputs	Operating inputs (labour, materials, chemicals, power etc) and assets are required to deliver outcomes. Grid Contracts. Demand forecasts. The Netserv Plan is a comprehensive plan setting out services, service standards, infrastructure, strategies (eg DSM) and forecast costs. Regulatory standards (including asset standards). Operating protocols. Drinking Water Quality Management Plans.
Decision maker	QCA determine revenues / prices. Government determines infrastructure, if regionally significant. The economic regulation framework to be developed will set out processes and criteria for determining allowed revenues / prices.
Delivery	DRs make decisions on asset delivery. DRs take account of Netserv Plan; revenues/ price approved by QCA, dividend and tax requirements and QTC loan approvals.

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Distribution Retailers – aspects affecting planning and delivery that are in the process of being resolved

- Economic Regulation
- Grid Contracts
- Asset regulatory framework
- Operating protocols and guidelines

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DRs-Economic Regulation

- QCA
 - Price oversight by QCA, 1 July 2010 to 30 June 2013
 - Expected QCA will become Price Regulator post 30 June 2013 (requires Act amendment)
- Economic regulation framework is expected to be developed by QCA
- Netserv Plans will be a critical input to Economic Regulation

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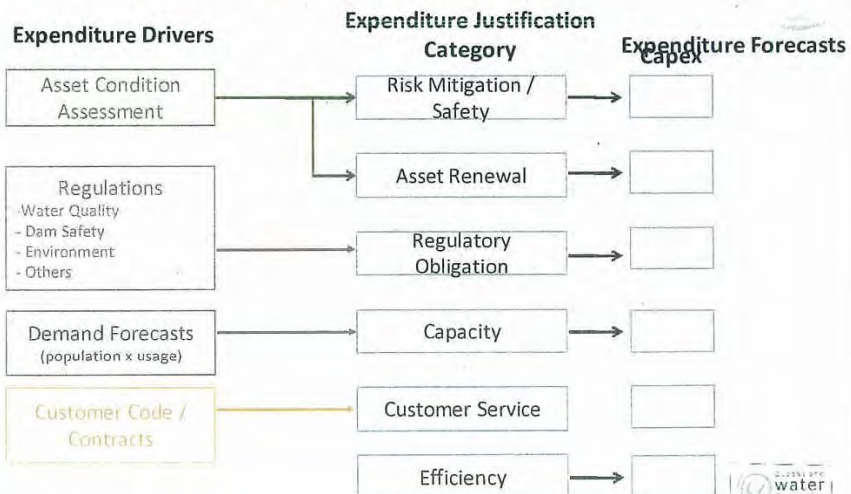
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 - QCA's economic regulation framework will define "expenditure justification categories"
 - Expenditure drivers will map on to expenditure justification categories

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How expenditure drivers are likely to be taken into account in economic regulation (generic, indicative).



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DRs - Grid contracts

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- From 1 July 2011, the *Water Act 2000* will make changes to current contract arrangements:
 - Contracts may be Negotiated or Default.
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 - The Minister may make a Default Contract that applies if no Negotiated Contract is entered.
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- QWC has an advisory role
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DRs – Asset Regulatory Framework

- Good engineering standards exist
- Good operating practices in Market Rules, Contracts
- Processes?
- Commission is having discussions with DRs and DERM.

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- Operating protocols are required between physically connected Grid Participants.
- A QWC Guideline for operating protocols must be finalised by 31 January 2011.
- Approved Operating Protocols must be submitted to the WGM before 31 January 2011. Approvals will align with the QWC Guidelines.
- Commission is having discussions with SEQWGM and grid participants – workshops and working group established.

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C. Grid Service Providers

Role	Operation, maintenance of existing assets to provide bulk water products and services Contractual relationship with WGM; Physical delivery to DRs, other customers - Other services eg Seqwater provides water management functions, environmental stewardship etc
Objectives	Deliver products and services in accordance with contractual and regulatory obligations. Operate commercially.
Outcomes	<i>At all times:</i> Deliver water of required characteristics in accordance with contracts and Water Quality Management Plans <i>Each Month:</i> Delivery in accordance with WGM grid instructions <i>Daily/ real time:</i> Coordinate with other GSPs (esp Linkwater and DRs according to operating protocols <i>Emergencies:</i> coordinate in accordance with Emergency Management Plans and as directed by WGM
Information and inputs	Operating Inputs (labour, materials, chemicals, power) and capital investments are required to achieve these outcomes. Demand forecasts. Assumption: QCA Economic Regulation will require GSPs to provide a detailed 3/5 year regulatory submission setting out forecast capital and operating expenditure. The regulatory submission will be justified based on asset management plans, contracts, regulatory obligations etc.
Delivery	GSPs make delivery decisions consistent with the revenues approved by the Price Regulator, dividend requirements (if any), tax and QTC loan approvals. Government determines infrastructure, if regionally significant.

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GSPs – aspect affecting planning and delivery that are in the process of being resolved

- Economic regulation

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GSPs – Economic Efficiency

- The Minister is the Price Regulator, as advised by QWC until 30 June 2011.
- From 1 July 2011-2013 QCA will provide advice to the Regulator on the grid service charges.
- It is expected that from 1 July 2013, QCA will become the Price Regulator.

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GSPs – Regulatory Drivers

- In making its determinations QCA must consider regulatory obligations such as:
 - Asset standards (articulated in SAMPs)
 - Drinking Water Quality Management Plans
 - Contractual Obligations
 - Market Rules requirements
 - System Operating Plan (SOP) requirements
- Expect “expenditure justification categories” (as discussed above).

29



D. SEQ Water Grid Manager

Role	Not for Profit. Whole-of-grid. To buy and sell water products and services to meet the needs of current and new customers.
Objectives	Meet obligations under the SOP and Market Rules. Maximise economic benefit through utilisation of grid assets
Outcomes	Compliance with security objectives (SOP); efficient operations and financial management; balanced risk and returns; minimise risk events and impacts.
Information and inputs	SOP, Market Rules (including demand forecasts), <u>contracts for supply</u> , risk management docs (DWQMP), asset capability, operational data; Tools, models, quality data.
Decision Maker	QWC approves the Operating Strategy. QWC Market Rules Administrator. Appointment of Board by Minister.
Delivery	NA

- Optimise grid
- How does WGM achieve compliance with its charter.

30



Medium-term?
High levels
of bilateral
monopoly

SEQWGM – aspect affecting planning and delivery that are in the process of being resolved

- Contracts for supply

31



SEQWGM – Contracts for Supply

- Contracts for supply include PRW, Category B.
- Planning implications depend on terms & conditions (reliability, quality ...)
- Need to understand whether any impact on security.
- QWC undertaking work on framework for WGM to enter contracts for supply.

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3. Further Issues identified

This section deals with potential issues that at this stage, have not been addressed.

The issues may require resolution in the short term or longer term.



Issues

- QWC has identified a range of outstanding issues
 - some are priority to resolve
 - some are required later
 - some are less important and will resolve over time
- QWC is seeking feedback
 - Have the issues been appropriately identified ?
 - What issues are causing material problems for the businesses, now?
 - What are the priorities?



Issue 1. What will the economic regulatory framework look like?

What are the regulatory pricing principles that will influence planning?

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Issue 2. Need clarity around planning processes that result in rationalisation, retirement of assets and reconfigurations.

Need to consider timing, security impacts, cross boundary impacts.

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Issue 3. Need clarity around planning issues which are uncertain or change over time and may cross boundaries between locally and regionally significant.

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Issue 4. How should local (DR) water supply project proposals be planned for and subject to economic regulation?

Need to clearly delineate between tiers of planning (regionally significant, local) drivers and associated roles and responsibilities.

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Issue 5. Need clarity in role of TWCM and sub-regional TWCM planning.

- Need to consider how TWCM planning integrates with economic regulation, local and regional planning processes.
- Need to consider how recommended projects will be funded and implemented.

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Issue 6. Is there a need for improved information flows at the connection points between the DRs and bulk entities, to facilitate good planning?

Role of WGM/QWC?

Need for improved understanding of matters around connection points eg pressures, capacities, reliability.

40



Issue 7. Need clarity of responsibility for demand forecasts, for each decision point.

41



What Else

- Other issues?
- What are the priority issues that must be resolved in the short term to enable businesses to move forward and meet their obligations?

42



What's Next

- Feedback on today
- QWC will consider feedback and develop a short term work program in response.

43



The End

44



Long Term Framework for Planning & Delivery of Water Infrastructure for the SEQ Water Grid

Discussions with GSPs
12 October 2010



Agenda

1. Introduction
2. Framework for planning
3. Issues
4. Next steps



1. Introduction



Background

- There appears to be some lack of clarity and understanding as to:
 - how water businesses, WGM and QWC will undertake certain aspects of their individual roles for planning and delivery;
 - how certain of the relationships between water businesses and regulators and departments will work.
- Also, there are a number of issues to be resolved.
- QWC considers it valuable to meet with stakeholders to improve understanding of the current planning and delivery arrangements, the issues to be resolved and priorities.



Purpose of presentation

- Assist the water businesses to better understand and prepare their internal planning processes
 - Now (2010 to 2013)
 - Post 2013
- By ...
 - Confirming and clarifying what is known about the planning framework, including what can be reasonably expected as the framework for economic regulation develops;
 - Identifying key issues that are currently unclear.



Context

- There are many parties with responsibility for regulation, planning and delivery of water services in SEQ.
- Different organisations have different drivers, regulatory contexts and planning frameworks depending on their roles.
- This framework is focussed on planning and delivery of infrastructure to achieve outcomes as defined by legislation, contracts etc.
- Infrastructure solutions must always prove themselves against non-infrastructure solutions to proceed to delivery.
- Wastewater is only considered where it impacts on water supply ie the water balance or quality.



Scope of planning and delivery framework for water infrastructure in SEQ

- Ultimate (Post 2013):
 - All infrastructure. Driven by- growth, usage, compliance, renewals, efficiency, drought. To achieve security and sufficiency of supply.
 - Applies to parties with planning roles:
 - QWC
 - GSPs (Seqwater, Linkwater, WaterSecure)
 - SEQ Water Grid Manager
 - DRs (Allconnex, Unitywater, Qld Urban Utilities)
 - Takes account of roles of QCA, DERM and other parties with regulatory and advisory responsibilities.
- Interim Arrangements (2010-2013)



7

1. Framework for planning



A framework for planning

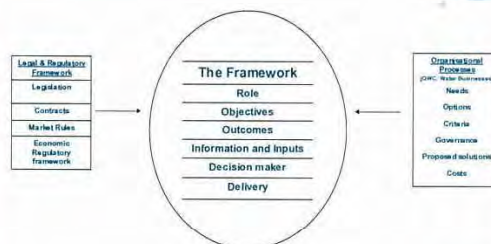
- The framework for planning and delivery can be described and organised in different ways.
- QWC considers this framework provides a useful way to systematically describe how planning and delivery is undertaken for each organisation ...

The Framework	
Role	
Objectives	
Outcomes	
Information and Inputs	
Decision maker	
Delivery	



9

A framework for planning



10

Application of the framework

- The following slides show how this framework can be applied for ...
 - QWC
 - DRs (Allconnex, Unitywater, Qld Urban Utilities)
 - GSPs (Seqwater, Linkwater, WaterSecure)
 - SEQ Water Grid Manager

and

-the status of aspects that are in the process of being resolved



11

Application of the framework

	A. QWC	B. DRs	C. GSPs	D. SEQWGM
Role				
Objectives				
Outcomes				
Information and Inputs				
Decision maker				
Delivery				

Aspects that are being resolved are shaded



12

A. QWC – planning and delivery framework

Role	- To provide advice to the Minister on water supply and demand management and the delivery of desired level of service objectives for the region. - Facilitate and implement the regional water security program. - Make and administer the system operating plan (SOP), act as the Market Rates Administrator, make water restrictions when required. Ensure compliance with programs and restrictions.
Objectives	Ensure the delivery of sustainable and secure water supply and demand management for SEQ.
Outcomes	- Advice on new regionally significant infrastructure to provide sufficient quantity, quality and reliability of water to achieve the level of service (LOS) objectives. - Timely delivery of appropriate infrastructure. - Collaborative planning integrated with total water cycle management outcomes, that provides opportunities for innovation.
Information and inputs	- SEQ Regional Plan, Regional Water Security Program for SEQ (LOS, portfolio), policy, asset capability, growth patterns, demand patterns, solution options, models, cost data etc. - QWC is seeking to improve its planning process & be more appropriate for "normal" types as distinct from the "responsive" approach during the water emergency.
Decision Maker	Minister makes regional water security program including LOS, infrastructure to achieve it and cost/price arrangements.
Delivery	Existing financial and procurement processes.

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QWC – aspect affecting planning and delivery that are in the process of being resolved

- "Normal" planning processes

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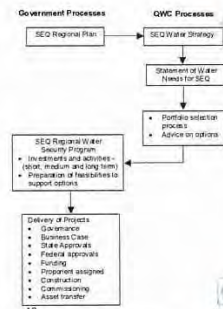
QWC - Improved planning processes (post drought)

- QWC considers the process should be open, inclusive and adaptive to new information over time.
- Requires separation of needs analysis and solution identification.
- Regionally significant infrastructure - to achieve security outcomes (level of service objectives), efficiently.
 - Planned system augmentations
 - Drought Response Plan
- Predominantly affects GSPs infrastructure
- Test processes against real examples

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QWC - Proposed planning process (post drought)

- QWC process to support the preparation of advice to the Minister.
- Follows from Strategy and water balance.
- SOWN aims to identify needs with a focus on water security (LOS) and regionally significant infrastructure.
- Options (infrastructure and non-infrastructure) will be sought from appropriate parties to satisfy needs.
- Best suite of options will be the basis of the preferred portfolio.

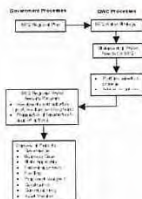


16

QWC - Proposed planning process (post drought)

Issues QWC is considering, include:

- How to manage inputs to SOWN.
- What are the policy and statutory implications of seeking private sector input into the process (options identification and review)?
- Criteria for assessment.
- Drought response component of planning.
- Are there appropriate legal powers/funding arrangements for the Commission to undertake detailed enquiries to support robust, high quality portfolio identification in advance of an approved RWSP?



17

B. Distribution Retailers (DRs) – planning and delivery framework

Role	Operate and invest to provide urban water distribution and retail services, and waste water and trade waste services. Other services may include delivery of recycled water.
Objectives	Deliver services efficiently to meet customer requirements and in accordance with regulatory obligations. Operate commercially.
Outcomes	Meet customer service standards (pressure, reliability, water quality – human health, aesthetic, odour, overflows etc). Meet retail service standards.
Information and inputs	Operating inputs (labour, materials, chemicals, power etc) and assets are required to deliver outcomes. Demand forecasts. The Netserv Plan (sets out services, service standards, infrastructure, strategies and forecast costs). Considers local government planning schemes. Customer Expectations. Regulatory standards (including asset standards, Operating procedures, Drinking Water Quality Management Plans).
Decision maker	QCA determine revenues / prices. Government determines infrastructure, if regionally significant. The economic regulatory framework, to be developed will take into account the need for determining efficient investment levels.
Delivery	DRs make decisions on asset delivery. DRs take account of Netserv Plan, revenues/price approved by QCA, dividend and tax requirements and QTC loan approvals.

18

Distribution Retailers – aspects affecting planning and delivery that are in the process of being resolved

- Economic Regulation
- Grid Contracts
- Asset regulatory framework
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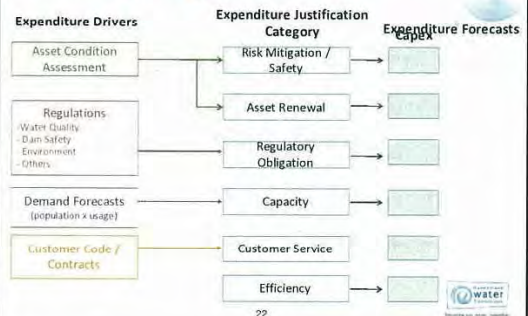
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C. Grid Service Providers

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Outcomes	<i>At all times:</i> Deliver water of required characteristics in accordance with contracts and Water Quality Management Plans <i>Each Month:</i> Delivery in accordance with WGM grid instructions <i>Daily/real time:</i> Coordinate with other GSPs according to operating protocols <i>Emergencies:</i> coordinate in accordance with Emergency Management Plans and as directed by WGM
Information and inputs	Operating inputs (labour, materials, chemicals, power) and capital investments are required to achieve these outcomes. Demand forecasts, Management Plans – drinking water, recycled water, leakage, assets. Assumption: QWC Economic Regulation will require GSPs to provide a detailed 35-year regulatory submission, setting out forecast capital and operating expenditure. The regulatory submission will be justified based on asset management plans, contracts, regulatory obligations etc.
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Decision Maker	QWC approves the Operating Strategy, QWC Market Rules Administrator. Appointment of Board by Minister.
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