



Secure and efficient water through partnership and innovation

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24 December 2010

Hon Stephen Robertson MP
Minister for Natural Resources, Mines and Energy
and Minister for Trade
PO Box 15216
Brisbane Qld 4001

Handwritten date 10/11/93, RECEIVED MINISTERIAL OFFICE, 17 JAN 2011, routing checkboxes for various departments and actions.

Dear Minister

I am pleased to respond to your letter of 25 October 2010 regarding options to and benefits of releasing water from key storages in anticipation of major inflows over the current wet season. Our advice follows, based on discussions with Seqwater.

Only four of the dams in South East Queensland region are gated, with the ability to release significant amounts of water in anticipation of major inflows. These are Wivenhoe, Somerset, North Pine and Leslie Harrison dams.

Detailed operational procedures have been approved for each of the gated dams. The dams will continue to be operated in accordance with these procedures. These procedures generally relate to the management of the dams and should be managed above Full Supply Level. This advice relates to the water security aspect of the management of the dams below Full Supply Level.

Based on information currently available, Seqwater has advised that releasing water to below Full Supply Level may provide some benefits in terms of reduced community and operational impacts during minor inflow events, such as has occurred over the past month. For medium and major flood events, it considers that pre-emptive releases will provide negligible benefits.

Informed by this advice, the SEQ Water Grid Manager has advised Seqwater that, from a water security perspective, it has no in-principle objection to minor releases from Wivenhoe, Somerset and North Pine dams to minimise the operational and community impacts of gate releases. Specifically, it has advised that it has no in-principle objection to:

- Wivenhoe and Somerset dams being drawn down to 95 per cent of their combined Full Supply Level
• North Pine Dam being drawn down to 97.5 per cent of its Full Supply Level.

The SEQ Water Grid Manager has assessed the water security implications of the release to be negligible, having no impact on our ability to meet the risk criteria specified in the System Operating Plan or our ability to meet our supply obligations to Grid Customers. From a water security perspective, the Queensland Water Commission has also confirmed that it does not have any objections to the potential release.

Please note that these 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.

For future wet seasons, the SEQ Water Grid Manager will continue to work with Seqwater to investigate the optimal arrangements. In particular, we propose to further investigate options that may reduce the frequency or duration of intermediate level flows (between 1,900 and 3,500 cubic metres per second). In addition, we recommend that the investigations with the Queensland Water Commission to examine the opportunity of raising the full supply level of Wivenhoe Dam for water supply be expanded to include options involving the release of the additional water once major inflows are forecast.

I trust that this advice is sufficient. If you have any questions, please do not hesitate to contact Mr Dan Spiller, Director Operations, by telephone on [REDACTED] or by email on [REDACTED]

Yours sincerely

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Gary Humphrys
Chair

ATTACHMENT

Wivenhoe and Somerset dams

Wivenhoe Dam can store up to 1.15 million litres (ML) of drinking water. In addition, it has the capacity to store an additional 1.45 ML of flood water.

While large, the flood compartment can be filled within days. For example, following heavy rainfall in October 2010 Wivenhoe Dam received inflows equivalent to almost half of the flood storage compartment capacity in just a few days.

Several factors influence flood release strategies for Wivenhoe and Somerset dams.

First, rain events that have caused flooding have historically been prolonged events over several days, often with a second event occurring several days to a week after the first. As a result, the operational procedures for the dam are designed to ensure that all water held in the flood compartments is released within seven days of a rain event, ensuring that the flood compartment is available for any future inflows.

Secondly, the dam only controls flood waters from part of the Brisbane River catchment area. About 50 per cent of the catchment area of the Brisbane River is upstream of the Wivenhoe Dam wall, and can be potentially controlled by it. No flood mitigation structures exist for most of the potential run-off from the other 50 per cent of the catchment area.

Third, the Bureau of Meteorology has had limited success in plotting rainfall distribution accurately to assess where most flooding risk lies above or below the dam wall. Historical floods have demonstrated that flooding can occur from both. For example, the 1974 flood flows primarily occurred below the dam wall whilst the 1890's event occurred above the dam wall. As a result, when releasing water from Wivenhoe Dam it is very important to predict and monitor below the dam wall flows so as to understand combined river flows that cause flood impacts.

Taking these factors into account, the flood release strategy for Wivenhoe and Somerset dams has a hierarchy of objectives:

- Ensure the structural safety of the dam
- Provide optimum protection of urbanised areas from inundation
- Minimise disruption to rural life
- Retain full supply level after a flood event
- Minimise impacts to flora and fauna during the drain down phase.

Within this framework, flood releases from Wivenhoe Dam typically fall into two categories of flood events based on the impact they cause when combined with below the dam wall catchment runoff:

- Larger events typically involving combined river flows greater than 3,500 cubic meters per second measured at Moggill. These events would have flood impacts on

urban areas in Brisbane. This scale of release has not been required since Wivenhoe Dam was completed.

- Smaller events with combined river flows of less than 1,900 cubic meters per second measured at the Mt Crosby weir which can inundate up to seven rural bridges isolating up to 50 households and causing inconvenience to many more. There has been six of these events since 1984, when Wivenhoe Dam was completed.

Our assessment of the benefits of lowering dam storage levels to reduce flooding impacts is below for these two event types.

Large events

Seqwater has advised that releases of greater than 3,500 cubic metres per second (m³/s) from Wivenhoe Dam are likely to impact on urban areas in Brisbane. Events of this nature have not been experienced since Wivenhoe Dam was completed in 1984.

Seqwater has advised that:

- pre-emptive releases are likely to have negligible impacts on the extent of these impacts
- any impacts would require releases of at least 250,000 ML. This is equivalent to a release of about 16 per cent of the combined storage capacity of Wivenhoe and Somerset dams.

A pre-emptive release of this scale is not recommended, based on information currently available. The potential water security impacts are considered to be more significant than the negligible benefits. These potential security impacts include costs associated with the earlier or avoidable operation of the desalination facility at capacity, as well as the increased probability of triggering the implementation of a drought response plan.

More detailed investigation of opportunities to actively manage flood storage is recommended, including options to increase flood supply level on a temporary basis. These investigations need to be led by Seqwater, and involve the Bureau of Meteorology, Councils and the SEQ Water Grid Manager.

In particular, it has been identified that it is worth investigating the impacts on downstream flooding for intermediate level flows (flows between 1900 and 3500 m³/s).

Seqwater will undertake extensive investigations for the Queensland Water Commission in early 2011 to examine the opportunity of raising the full supply level of Wivenhoe Dam for water supply. We will recommend that the scope of this work be widened to consider the benefits of pre-lowering storage levels based on mid range rainfall events and the reduced impacts to river levels and subsequent property impacts. It is noted that predicting rainfall intensity and location, even as events are about to occur has not been accurate, however the Bureau of Meteorology is improving its methods.

Smaller events

Pre-emptive releases from Wivenhoe Dam may reduce the impacts of minor gate releases (strategies W1A to W1E in the operational procedures).

Minor gate releases may result in the closure of up to six bridges, isolating up to 50 dwellings and inconveniencing many more. As stated in existing flood management plans, releases should be managed to minimise the impacts on these residents. Over the immediate term, Councils have requested that bridge closures be avoided over the Christmas to New Year period, if at all possible. In addition:

- There are resource implications involved in the activation of the flood control centre. Under flood management plans, the centre must be staffed by suitably qualified officers at all times during gate releases. There are currently only four quality duty engineers, who have staffed the flood centre for much of period since the initial release in October.
- Gate releases during the Christmas holiday period would result in closure of dams to water based activities, impacting on up to 150,000 people who are expected to use the recreational facilities over the holiday period.

The Water Grid Manager has advised Seqwater that, from a water security perspective, it would not object to water being released from Wivenhoe and Somerset dams to 95 per cent of storage capacity at any time until end March 2010.

Under this recommendation, storage levels could potentially be reduced by up to about 77,250 ML. This is equivalent to the amount of water released between 13 and 16 December 2010, through a single gate.

Pre-emptive releases will be managed so as to minimise the likelihood of gate releases due to small storms and local rainfall. Storage capacity will usually be reduced through a combination of:

- Extended gate releases, especially for strategy W1C. For comparison, up to 130,000 ML/day was released during in November and mid December 2010. At this rate, the additional releases could occur in about half a day.
- Ongoing gate releases of up to 30,000 ML/day, which do not isolate any residents but can inundate some lower bridges that cause inconvenience.
- Ongoing valve release of up to about 4,300 ML/day, which can be maintained without inundate any bridges.

Actual releases would be decided by Seqwater based on operational considerations and in accordance with its statutory and regulatory obligations.

Water security impacts

The water security impacts of releases will be zero if the dams fill over the remainder of the wet season. Current forecasts indicate that there is a high probability of this occurring:

- Heavy rainfall is forecast over the Christmas holiday period, as noted above.
- Over the remainder of the wet season, advice from the Bureau of Meteorology is that sea surface temperatures are likely to remain at levels typical of a La Niña event into the first quarter of 2011, with the majority of the models indicating the event will gradually weaken over the coming months.

The water security impacts will be minimal, even if there were no further inflows to the dams. Modelling indicates that the reduction would have a minimal impact on the probability of key water Grid storages falling to 40 per cent of capacity over the next five years.

North Pine and Leslie Harrison dams

North Pine and Leslie Harrison dams do not have flood mitigation potential. Once the dams have reached Full Supply Level, all water flows into the dam must be released to protect the structural safety of the dam.

Seqwater has advised that, without major releases, there are negligible benefits to reducing volumes stored in North Pine or Leslie Harrison dams for the purposes of reducing the extent or duration of any downstream flooding impacts.

For North Pine Dam, there may be some operational and community benefits to minor releases to below Full Supply Level in some circumstances. Any gate operation at North Pine Dam results in inundation of Youngs Crossing Road, which isolates a number of residents. These impacts are currently being minimised by releasing from North Pine Dam at night. With further rainfall forecast, Seqwater may choose to reduce the level to below Full Supply Level in order to reduce the frequency of night releases or the likelihood of releases being required during the day.

For this dam, the SEQ Water Grid Manager has advised Seqwater that, from a water security perspective, it would not object to water being released to 97.5 per cent of storage capacity at any time until end March 2010.

For Leslie Harrison Dam, gate operations do not impact on public roads and generally only inconvenience the general public during large flood events. There is no scope to reduce this inconvenience through small pre-emptive releases. Accordingly, no in-principle approval be made for pre-emptive releases from this dam.