Queensland Water Commission

Project Plan

For

Investigation into Scenarios of Operation for SEQ System Operating Plan

January 2011

1. Project Purpose

The purpose of this investigation is to assess the impact on the security of supply, over the immediate and long term due to potential lowering of the operating level of Wivenhoe Dam.

2. Project Background

Major flooding occurred in the Brisbane River catchment on 13 January 2011, coinciding with a king tide and significant uncontrolled inflows from the Lockyer and Bremer river catchments.

This resulted in the Brisbane River peaking at 4.46m at the Port Office in Brisbane City and has the following impacts:

- 20 fatalities (to-date)
- 31,520 properties affected
- 11, 879 homes flooded over the entire property
- 14,685 homes partly flooded
- 4,956 businesses inundated
- 40,000 evacuees in Brisbane, Ipswich and the Lockyer Valley.

This flood is about 1m lower than the 1974 Flood event of 5.45m at Brisbane City.

However, the social and economic impacts are expected to be much more significant given the developments over the last 37 years.

The Minister for Natural Resources, Mines and Energy and the Minister for Trade has written to the Commissioner on 20 January 2011, requesting the Queensland Water Commission provide all necessary assistance to SEQWater in their review of the operation of Wivenhoe and Somerset dams in view of the fact that this is still in the middle of a wet season and further significant inflows into the dams may be possible.

This work is to be carried out as a matter of priority and urgency.

3. Role of Queensland Water Commission

Queensland Water Commission is responsible for the approval of the SEQ System Operating Plan (SOP) which sets the framework for the supply to meet the desired levels of service objectives for the SEQ region as stipulated in the SEQ Regional Water Security Program. The SOP is intended to deal with the immediate/short term timeframe, and contains the operating rules and the reporting requirements for the SEQ Water Grid Manager. In the longer term, the water security for SEQ is guided by the SEQ Water Strategy to ensure supply meets demand over the next 50 years.

The Commission would need to determine the potential impacts on the water supply security and its impacts for various scenarios of lowering the water level at Wivenhoe

Dam. The water level may be lowered by controlled release prior to an impending wet season.

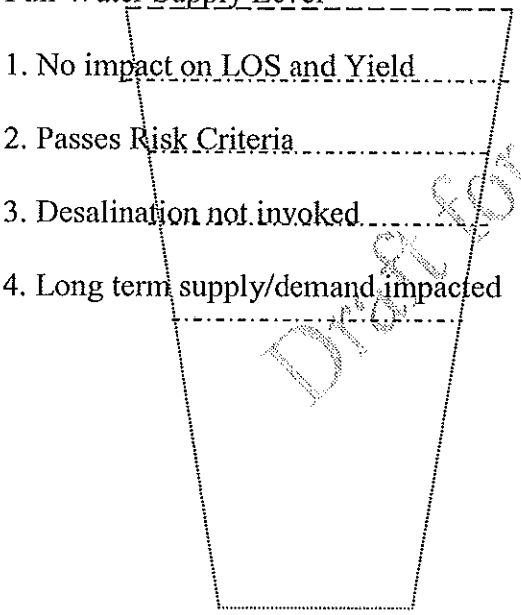
4. Conceptual Threshold Levels

To assist in this investigation, it is useful to determine the various threshold levels which can be expressed as follows:

Threshold Level	Description
1	No impact on Level of Service (LOS) and LOS Yield
2	When just passes Risk Criteria
3	When present demand is met without invoking full desalination (SEQ Grid storages above 60%)
4	Long term supply/demand balanced impacted

The project is scoped below in part to determine these thresholds.

Figure 1: Conceptual Wivenhoe Dam showing Threshold Levels



5. Project Scope

To meet the project purpose, the proposed scope of the investigation is provided below.

Short Term (over next 6 months)

1. Determine the volume of release (or dam level) which will have no impact on the existing entitlement of the Water Grid Manager for this water year 2010/2011 - based on most likely demand over the next 6 months (no refill scenario).
2. Carryout hydrologic assessment to determine the Risk Criteria using the SEQ Regional Water Balance Model:

Case	% Reduction Wivenhoe (from full supply)	Volume of Water Released from Wivenhoe Dam (ML)	%reduction of Grid 12 Storages (from full supply)
1	10	116500	5.6
2	12.9	150285	7.3
3	20	233000	11.3
4	30	349500	16.9
5	40	466000	22.5
6	50	582500	28.1

This would identify the trigger point for when the volume of release would impact on the supply security.

3. For Case 6 (subject to results from 2 above), determine the timing and corresponding probabilities of various inflows when 60% is reached for the Grid 12 storages. This provides an idea of when the desalination may need to be triggered in full, and the operation costs incurred.
4. For Case 6 (subject to results from 2 above), determine the timing and corresponding probabilities of various inflows when 40% is reached for the Grid 12 storages. This provides an idea of when the purified recycled water may need to be triggered in full, and the operation costs incurred.
5. Initial assessment of the potential for reducing demands via restrictions or education, and determine the new demand. This may impact on the price path. Reassess the implications with the reduced demand, if required as compared to the use of manufactured water.

Long Term

1. Assess the impact on the level of service and yield with a "permanent" reduction in the full supply level – various supply levels to be investigated.
2. Assess the impact on the demand/supply balance i.e. potential to bring forward new infrastructure.

3. Determine the cross-over point for desalination versus demand management (based on cost).
4. Assess the appropriateness of the current Levels of Service objectives in the SEQ Water Strategy. This may involve some social and economic studies to ascertain the impact of restrictions and risk of failure.
5. Carry out Annual Review of the SEQ Water Strategy

Feedback with SeqWater

The results from the investigations are shared with SeqWater and any feedback received may result in the Commission needing to carryout further assessments.

6. Project Governance

A Project Steering Committee will oversee the direction of this investigation. The Committee consists of:

- Karen Waldman, CEO (Chair)
- Tad Bagdon, A/GM (RPP)
- Gayle Leaver A/GM (Water Reform)

The Committee will meet on a daily basis initially. The frequency of meeting in the future will be determined when appropriate.

The Committee will be supported by a Project Team, consisting of:

- Wai-Tong Wong, A/Director (Water Strategy) – Project Manager
- Mark Askins, A/Director (Water Information) – Deputy Project Manager (?)
- Justin Claridge, A/Senior Senior Strategic Information Analyst
- Wendy Auton, Project Officer
- Richard Scott, Manager Market Rules Administration

The composition of this team may be amended to meet various requirements as the project progresses and new work emerges.

Please amend above to suit – only my initial thoughts

7. Process

To ensure the project is managed adequately to meet the objectives, the following process should be followed:

1. All documents should be placed in TRIM. A folder will be created for access by the Project Steering Committee and the Project Team (Project Manager to advise).
2. All key actions and outcomes will be recorded.

3. All key assumptions and results for the modelling runs recorded appropriately for easy reference.
4. Modelling inputs and results be reviewed and checked.
5. etc (to be added)

8. Funding

Short Term assessments are to be met within current operational budget.

Long Term assessments will require funding for consultancies.

9. Timelines

Short Term Assessments – by 2 March 2011(?)
Long Term Assessments – by end June 2011 (depending on scope of works)

Mary.

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SEQ Water Strategy

Prepared (supply ready)

Conserve (use less)

Manage efficiently

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Context

- Water supplies are secure over the short-medium term
- We do not need to make a decision on the next supply source before the next Strategy review in 2014
- Key variables:
  - water use (demand rebound)
  - growth projections
  - climate change
- There is general community support for Target 200
- Current use is trending down but varies over the region
- Community feedback
  - over 60% support the current level (Target 200)
  - over 80% support planning to provide more water than normally required

Region	PWCM (01/12/09 – 28/05/10)	Last Week (Ending – 28/05/10)
SEQ (as a whole)	165 L/p/d	151 L/p/d
Central SEQ	146 L/p/d	137 L/p/d
Gold Coast	201 L/p/d	177 L/p/d
Sunshine Coast	215 L/p/d	188 L/p/d
Scenic Rim	144 L/p/d	123 L/p/d
Redland	193 L/p/d	172 L/p/d

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SEQ Water Strategy

Prepared (supply ready)

- Baseline security through a portfolio of sources and optimising their conjunctive use
- Preparedness to respond to drought or growth trigger
- Prudent to maintain existing planning base until next review
- Investigate new sources, substitution, decentralised/local supplies (proactive research, project support, guidelines development and sub-regional planning)

Conserve (use less)

- Comprehensive approach to demand management

Manage and operate efficiently

- Achieve LOS objectives, while minimising costs where possible
- Options to use available water above LOS needs for interruptible supply for rural production and to outside of SEQ region
- Monitor and review with annual assessment and update, with consideration given to climate variability and climate change knowledge

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SEQ – demand/supply balance

Demand

- Planning assumption of 375 litres/person/day (that includes 230 litres/person/day residential use)
- Demand management through Target 200, education, PWCM and regulation including innovative and total water cycle management solutions (such as water sensitive urban design)
- Key message: community behaviour significantly determines when future supply augmentation is required

Supply

- Level of Service objectives – calculate LOS yield needed
- Portfolio of sources – dams, groundwater, PRW, desalination (climate vulnerable, climate resilient and climate independent)
- PRW critical standby source
- Investigate and preserve viable options to be ready through a robust, transparent and inclusive process
- Innovative solutions (such as stormwater harvesting, local reuse)

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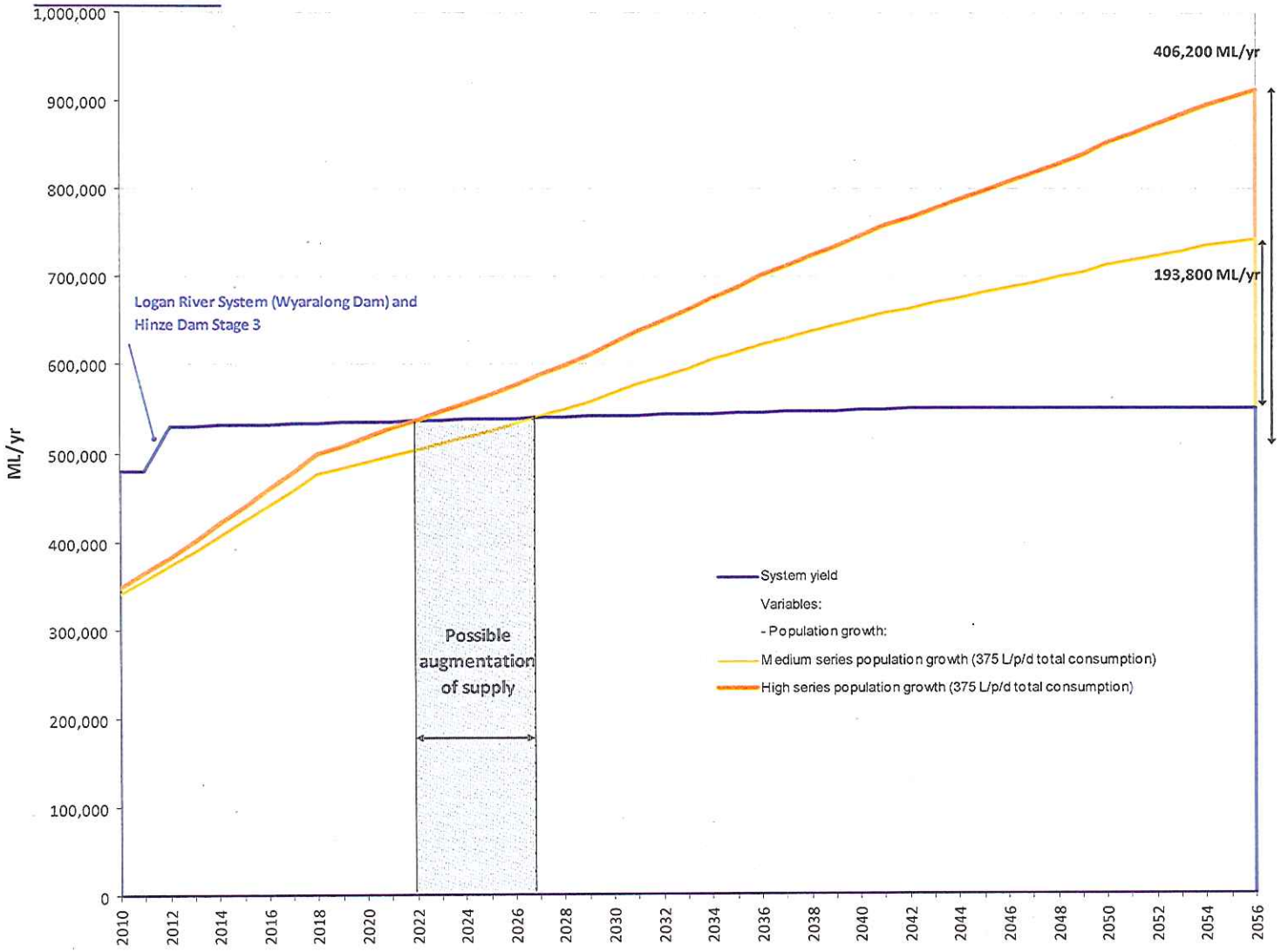
Water balance in normal operating mode

375 litres/person/day



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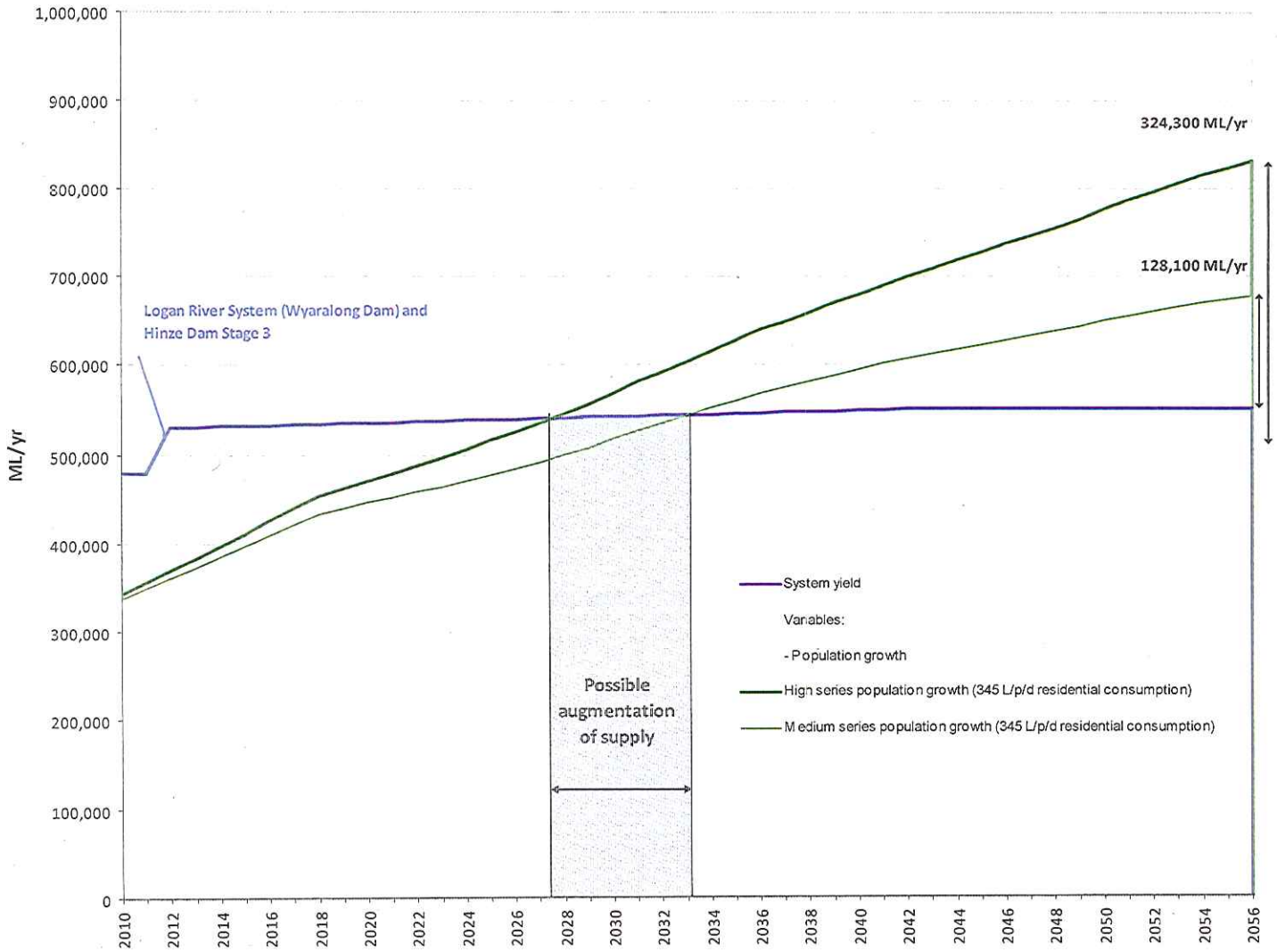
Climate change scenario may bring forward augmentation date. The Strategy is designed to deal with such variability.

Water balance in normal operating mode

345 litres/person/day



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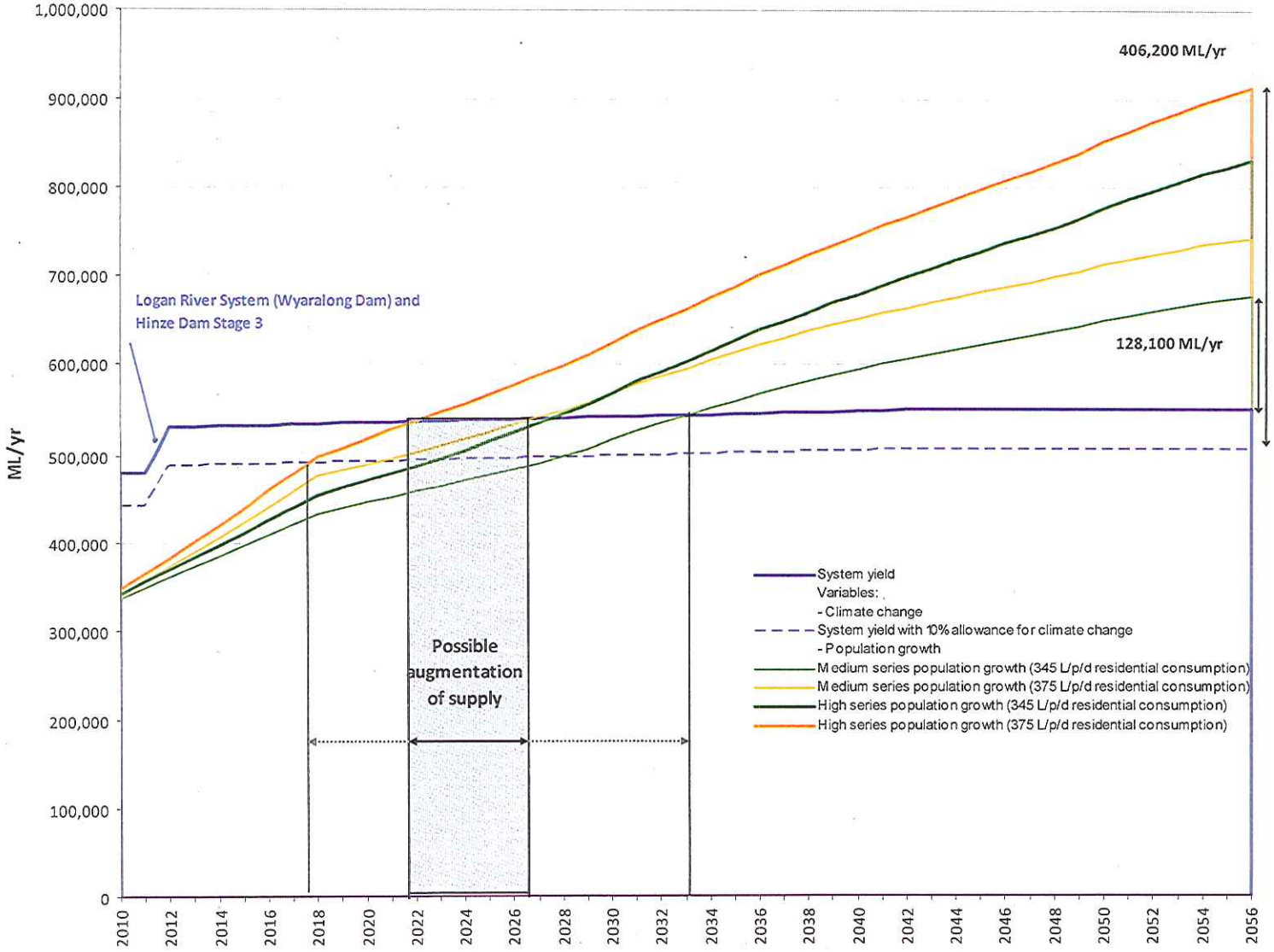

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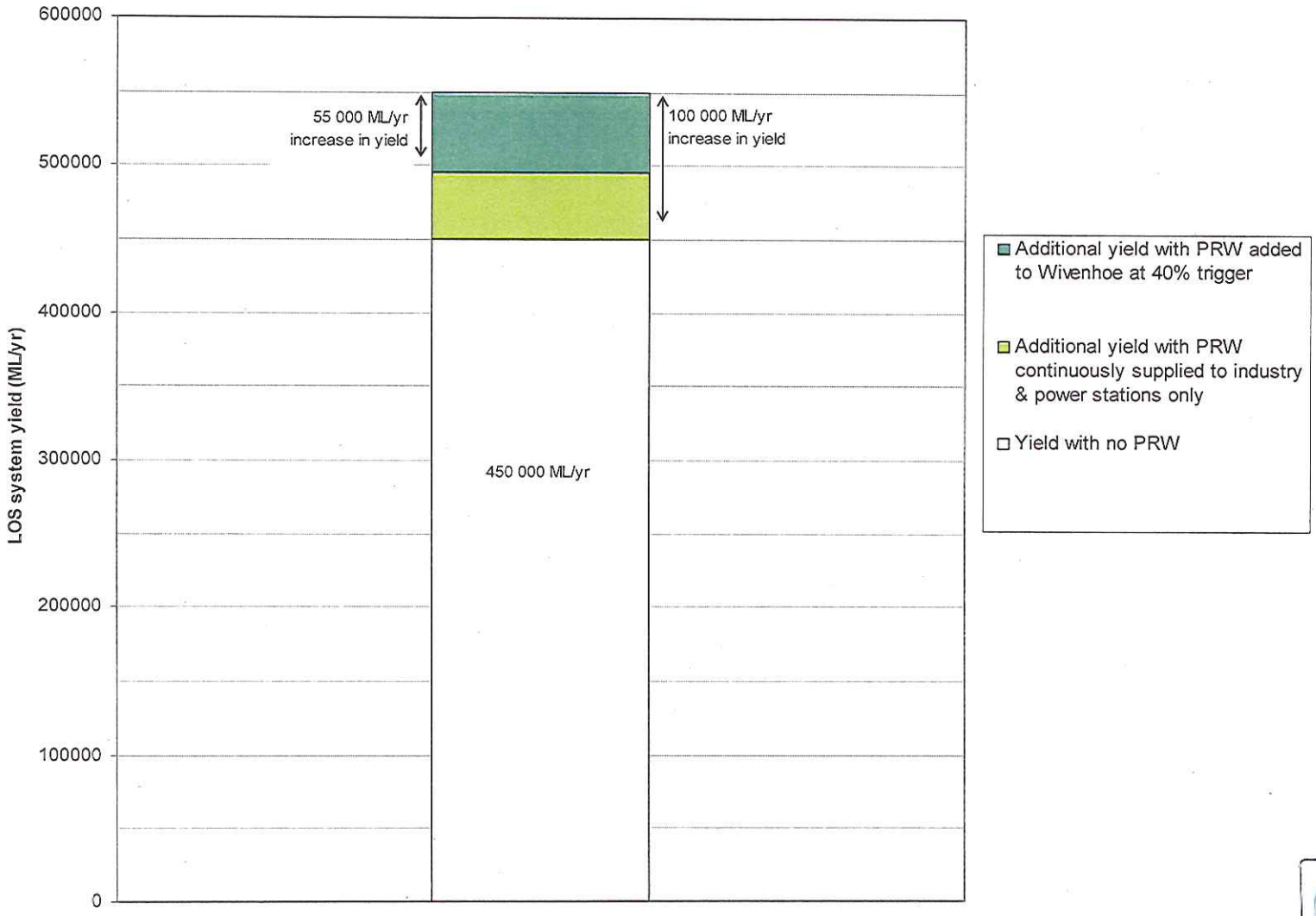
Impact of varying the PRW trigger



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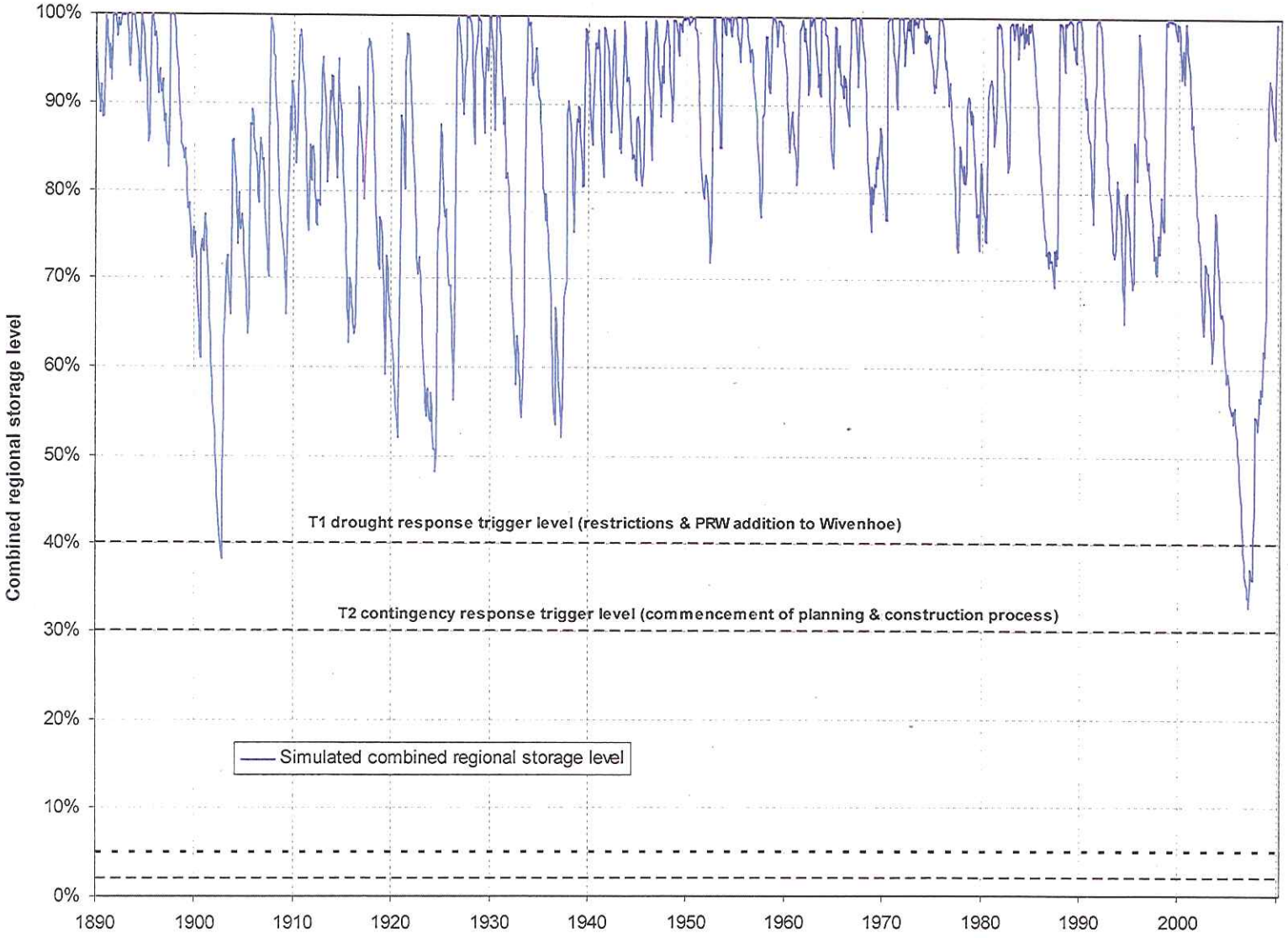
Simulated Water Grid levels

based on historic inflows and operating LOS system yield



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In 2004-05 storages fell from 60% to 17%; if the Water Grid had been in place they would not have fallen to below 30%.

Contentious issues

- Proceeding to plan for preserving desalination sites
- Belief that local supplies can replace infrastructure – the Strategy supports developing decentralised systems (above existing regulated requirement) where they meet the supply criteria of safety, security and reliability at acceptable cost for whole-of-life
- Key growth areas – the Strategy provides for key growth areas and in addition, through subregional planning, includes assessment and championing innovative approaches
- Mary Valley investigations to proceed with stakeholder involvement
- Realisation of PRW use, including addition to Hinze and North Pine Dams
- The Government has already committed to a planning basis of 375 litres/person/day (which includes a 230 litres/person/day residential use) through such instruments as the Regional Water Security Program and the System Operating Plan