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## NSW Government – Planning & Environment (DPIE)

### Murray and Murrumbidgee Draft *Regional Water Strategies* – Climate and Hydrological Modelling, and Regional Challenges.

#### RGA Submission – November 2023

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#### Introduction:

Thank you for the opportunity to comment on this next phase of DPIE's work in the Murray and Murrumbidgee Valleys. We're happy with the approach the Department is choosing to take in this next round of consultation. This is a long-term conversation with communities.

We have reviewed your documentation in relation to climate and hydrological modelling, and regional challenges. We have identified some matters raised in the documentation that we'd like to discuss further, and that some that we'd also like further clarity around.

These matters are captured in Table One.

**Table One: RGA Commentary - Climate & Hydrological Modelling, & Regional Challenges.**



REGIONAL WATER STRATEGY CONTENT	RGA COMMENTARY
<p>To improve strategic water planning initiatives, new ground-breaking climate datasets and hydrological modelling, developed for the <i>Regional Water Strategy</i> program, provide a complementary understanding of the climate variability in the NSW Murray and Murrumbidgee regions beyond the recorded historical data.<sup>1</sup></p>	<ul style="list-style-type: none"> <li>• What external peer reviews have been done of this approach?</li> <li>• What do you see as the potential weaknesses in this approach?</li> <li>• What other climate scenarios were considered? Why weren't they chosen?</li> </ul>
<p>To support the development of the draft NSW Murray and Murrumbidgee Regional Water Strategies, this document presents climate and baseline hydrological modelling results under three plausible climate scenarios and their respective implications for regional water resources.<sup>2</sup></p>	<ul style="list-style-type: none"> <li>• We acknowledge the significant amount of modelling effort that has gone into this process.</li> <li>• We note that managing increased water variability will require good, real-time decision-making.</li> <li>• Science/modelling on its own won't provide for this.</li> <li>• What real-world testing will be done to inform Strategy options, based on past decision-making?</li> <li>• What discussions/negotiations will be held with all users around acceptable levels of risk?</li> </ul>
<p><b>Figure 1.</b> Regional water strategy modelling and options assessment methodology.<sup>3</sup></p>	<ul style="list-style-type: none"> <li>• This figure provides some <i>metrics for quantitative assessment</i>, which includes <i>economic prosperity</i>.</li> <li>• What assumptions were used for this particular metric?</li> <li>• How does your assessment of economic prosperity change under the three selected climate scenarios?</li> </ul>
<p>Persistent droughts have commonly and increasingly ended with significant rainfall events.<sup>4</sup></p>	<ul style="list-style-type: none"> <li>• What options optimise the benefit of this observed scenario?</li> </ul>
<p><b>Figure 4.</b> Potential evapotranspiration for the NSW Murray region under the dry future climate scenario<sup>5</sup></p>	<ul style="list-style-type: none"> <li>• How significant do you think this modelled change would be if it eventuates?</li> <li>• What 'non-water' options (on-farm, river operations, storage) could alleviate this impact?</li> </ul>

<sup>1</sup> [Climate and Modelling Report.pdf](#), p. 6.  
<sup>2</sup> [Climate and Modelling Report.pdf](#), p. 6.  
<sup>3</sup> [Climate and Modelling Report.pdf](#), p.9.  
<sup>4</sup> [Climate and Modelling Report.pdf](#), p.15.  
<sup>5</sup> [Climate and Modelling Report.pdf](#), p.20.

REGIONAL WATER STRATEGY CONTENT	RGA COMMENTARY
<p><b>Figure 10.</b> Impact of climate scenario on NSW Murray high security available water determinations.<sup>6</sup></p>	<ul style="list-style-type: none"> <li>• In both Valleys, there's not a huge variation in how High Security performs under all climate scenarios.</li> <li>• Why do you think this is?</li> <li>• What learnings from this observation could be applied to General Security to improve its performance?</li> </ul>
<p>Results of assessments of modelled town water demands against the available supplies, considering the three climate scenarios – historical climate, long-term historical climate and dry future climate scenarios.<sup>7</sup></p>	<ul style="list-style-type: none"> <li>• For both Valleys, what are the potential weaknesses of your 'future population demand' assumptions?</li> <li>• What other demand assumptions were considered? Why weren't they chosen?</li> <li>• How influential do you think alternative supplies (e.g. groundwater, desal, recycling) could be?</li> </ul>
<p><b>Figure 15.</b> Impact of climate scenario on seasonal high flows in the Murrumbidgee River at Lobbs Hole.<sup>8</sup></p>	<ul style="list-style-type: none"> <li>• Given the third scenario is absolute worst-case, future flows may not be devastatingly reduced.</li> <li>• If so, what policy/management options could further reduce the largest gaps in this Figure?</li> </ul>
<p><b>Figure 24. 4.</b> Impact of climate scenario on Murrumbidgee general security available water determinations<sup>9</sup></p>	<ul style="list-style-type: none"> <li>• We note that for both Valleys the results do not include carryover.</li> <li>• As a policy tool, how can carryover be used to improve General Security performance under these scenarios?</li> <li>• What else can be done to improve the performance of General Security<sup>10</sup> under variable water access?</li> </ul>
<p>Further investigation into the trends impacting reliability of water licences was suggested as a way of understanding the extent of the issue and identify drivers and options to address.<sup>11</sup></p>	<ul style="list-style-type: none"> <li>• We support this work being undertaken in both Valleys.</li> <li>• We believe this work should include both state and Federal policies that may have an influence.</li> <li>• What are DPIE's intended next steps in progressing this work?</li> </ul>
<p>Over the next 20 years, agriculture and agribusiness will continue to be key economic drivers for the region.<sup>12</sup></p>	<ul style="list-style-type: none"> <li>• We note this statement is made in relation to both Valleys.</li> <li>• How does DPIE intend to ensure the long-term viability of these industries in both Valleys?</li> <li>• What policy options will be pursued under the <i>Regional Water Strategies</i> to deliver this?</li> </ul>

<sup>6</sup> [Climate and Modelling Report.pdf](#), p.27.

<sup>7</sup> [Climate and Modelling Report.pdf](#), for example on p. 28.

<sup>8</sup> [Climate and Modelling Report.pdf](#), p. 41.

<sup>9</sup> [Climate and Modelling Report.pdf](#), p. 53.

<sup>10</sup> For example, in the Murrumbidgee Valley, General Security allocations can be very slow to grow – early in the water year – when storages are full.

<sup>11</sup> [Murray Challenges.pdf](#), p. 13.

<sup>12</sup> [Murray Challenges.pdf](#), p. 32.

REGIONAL WATER STRATEGY CONTENT	RGA COMMENTARY
Stakeholders also highlighted the significant social and economic impacts experienced by the regions as a result of buy-backs of water for the environment, under the Basin Plan, and requested an investigation into the impacts on NSW communities and industries. <sup>13</sup>	<ul style="list-style-type: none"> <li>• We note DPIE recognises this as a challenge and response in relation to both Valleys.</li> <li>• What are DPIE’s intended next steps in progressing this work?</li> <li>• We’d like DPIE’s work to include threshold limits for each Valley, beyond which purchase can’t be supported.</li> </ul>
The draft <i>Western Regional Water Strategy</i> has proposed three options (30, 50 and 52) which may impact on water availability in the NSW Murray River. The hydrological, economic and environmental assessment of these options will be conducted as part of the Western Regional Water Strategy. <sup>14</sup>	<ul style="list-style-type: none"> <li>• Consideration of these options must be included in progression of the <i>Murray Regional Water Strategy</i>.</li> <li>• It’s important that Murray water users understand the full-suite of potential reliability impacts.</li> </ul>
We need to explore a range of ways to improve water availability for water entitlement holders, considering opportunities and challenges afforded under both wet and dry years. <sup>15</sup>	<ul style="list-style-type: none"> <li>• We support this statement, especially as it relates to optimised use in wet years.</li> <li>• We note DPIE has flagged this for policy/management response in both Valleys.</li> <li>• What options has DPIE considered so far in relation to this particular set of opportunities?</li> <li>• How soon can stakeholders be consulted on these options?</li> </ul>
Investigating existing water management rules and behaviours that may potentially underpin underuse. This issue requires further analysis. <sup>16</sup>	<ul style="list-style-type: none"> <li>• We support this work being undertaken in both Valleys.</li> <li>• We also note that a NSW-lead Working Group has already been established in relation to underuse.</li> <li>• What will DPIE specially pursue within these <i>Regional Water Strategies</i>, to further progress this issue?</li> </ul>
In the Murrumbidgee River system, delivery constraints in the Tumut and mid-Murrumbidgee Rivers are a significant part of the challenge to meet the current and future needs of irrigated agriculture. An expansion of permanent plantings and environmental water use downstream makes it difficult getting water to where it is needed and increases the chance of potential supply shortfalls. <sup>17</sup>	<ul style="list-style-type: none"> <li>• With regard to potential supply shortfalls, what policy options are currently under investigation?</li> <li>• In terms of the full-suite of constraints described here – what Basin Plan opportunities exist?</li> </ul>

<sup>13</sup> [Murray Challenges.pdf](#), p. 35.

<sup>14</sup> [Murray Challenges.pdf](#), p. 36.

<sup>15</sup> [Murray Challenges.pdf](#), p. 39.

<sup>16</sup> [Murray Challenges.pdf](#), p. 40.

<sup>17</sup> [Bidgee Challenges.pdf](#), p. 35.