



## Memo

**Date:** 18 September 2015

**To:** The Collaborative Stakeholder Group

**From:** Bryce Cooper, Chair, Technical Leaders Group

**Subject:** Update to the CSG on Scenario modelling

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### Round one modelling

Four scenarios were confirmed by the CSG at CSG12 to be modelled in the first round:

- Scenario 1 - Protect and restore – substantial improvement to meet Vision and Strategy for swimming, taking food and healthy biodiversity
- Scenario 2 - Improve to at least minimum state everywhere and no degradation
- Scenario 3 - Improve but may not achieve minimum state everywhere
- Scenario 4 - Maintain – no further decline taking into account N load already in groundwater

CSG considered that achieving Scenario 1 would give effect to the water quality aspirations of the Vision and Strategy. Scenario 4 holds the line for all contaminants but does not improve water quality. Scenarios 2 and 3 are intermediate, but do not represent steps or staged improvement between Scenarios 4 and 1. The four scenarios were modelled either without constraint on the extent of land use change, or constrained to a level of land use based on previous historical land use change.

### Round two modelling

After presentation of the Round one modelling results at CSG15, the CSG discussed the concept of 'stepping-stones' towards scenario 1 and looking for 'low-hanging fruit' where initial water quality gains could be made cost-efficiently. These discussions led to guidance being provided to the TLG on round 2 modelling. As a result of that guidance, TLG are now working through modelling the second round of scenarios below. Those scenarios with an \* are being taken through to the Regional Economic Model (1, S2 to S7). The results of this modelling will inform which of the scenarios would be most sensible to run through the 2<sup>nd</sup> round of Integrated Assessments.

<b>Scenario 1*</b>	Substantial improvement in water quality for swimming, taking food and healthy biodiversity (Scenario 1 from first round scenarios with minor updates of chlorophyll data)
<b>Scenario S2*</b>	Constrained land use; each attribute improves by 10% of the difference in concentration between current state and Scenario 1
<b>Scenario S3*</b>	Constrained land use; each attribute improves by 25% of difference in concentration between current state and Scenario 1
<b>Scenario S4*</b>	Constrained land use; each attribute improves by 50% of difference in concentration between current state and Scenario 1
<b>Scenario S5*</b>	Constrained land use; each attribute improves by 75% of difference in concentration between current state and Scenario 1
<b>Scenario S6*</b>	No land use change; each attribute improves by 10% of the difference in concentration between current state and Scenario 1.
<b>Scenario S7*</b>	No land use change; each attribute improves by 25% of difference in concentration between current state and Scenario 1.
<b>Scenario S8</b>	Unconstrained land use change; each attribute improves by 50% of the difference in concentration between current state and Scenario 1.
<b>Scenario S9</b>	Unconstrained land use change; each attribute improves by 75% of difference in concentration between current state and Scenario 1.
<b>Scenario S10</b>	Unconstrained land use change; each attribute improves by 100% of difference in concentration between current state and Scenario 1.
<b>Scenario S11</b>	Constrained land use; each attribute improves by 10% of the difference in concentration between current state and Scenario 1. Total nitrogen is left free, required to just be maintained at or beneath its current level.
<b>Scenario S12</b>	Constrained land use; each attribute improves by 25% of difference in concentration between current state and Scenario 1. Total nitrogen is left free, required to just be maintained at or beneath its current level.
<b>Scenario S13</b>	Constrained land use; each attribute improves by 50% of difference in concentration between current state and Scenario 1. Total nitrogen is left free, required to just be maintained at or beneath its current level.
<b>Scenario S14</b>	Constrained land use; each attribute improves by 75% of difference in concentration between current state and Scenario 1. Total nitrogen is left free, required to just be maintained at or beneath its current level.

Three additional scenarios are yet to be modelled:

- water quality under conditions prevailing in 1863;
- business as usual based on the implications of land use change trends continuing; and
- water quality improvement already achieved by mitigations already implemented.