ATTACHMENT 1

PROPOSED APPROACH FOR RECALCULATING THE BDL FOR THE SA NON-PRESCRIBED AREAS (SS10) SDL RESOURCE UNIT

Basis for Recalculation of BDL

1. The BDL of 3.5 GL for the South Australian Non-Prescribed Areas (SS10) SDL resource unit was calculated as the sum of the farm dam impacts for five of the Surface Water Management Areas (SWMAs) listed in Table 33 of the report on interception activities published by the National Water Commission (NWC) (*Surface and/or groundwater interception activities: initial estimates, June 2010*)[1].
2. The SWMAs included in the 3.5 GL estimate were: Burra Creek (800 ML/y), Coorong (19 ML/y), Kakoonie (200 ML/y), Murraylands (2500 ML/y) and Mypolonga Flat (0 ML/y) – a total farm dam interception impact of 3.519 GL/y (rounded to 3.5 GL/y).
3. A number other SWMAs whose areas lie completely within SS10 are listed in Table 33 of the NWC report, but do not appear to have been included in the BDL estimate. These are: Ferries-McDonald (38 ML/y), Mallee PWA (3400 ML/y), Noora (440 ML/y), Peake-Roby-Sherlock PWA (430 ML/y) – a total farm dam interception impact of 4.308 GL/y.
4. The Tintinara-Coonalpyn PWA SWMA is also listed in Table 33 of the NWC report, which has a small area that lies within SS10. The farm dam impact was calculated as 1100 ML/yr but there is no breakdown as to proportion that is within SS10.
5. The map of the geographic boundaries of the SWMAs for SS10 (provided by the MDBA) indicates an additional SWMA – Mallee – that covers a large area north of the River Murray. It is not known why this SWMA was not listed in Table 33 of NWC report and a farm dam impact determined, particularly given that this is an area with a significant number of farm dams.
6. At 30 June 2009, State water management law (SA MDB Regional NRM Plan Vol. 3 – Regulatory and Policy Framework, April 2009) included specified farm dam limits totalling 32.27 GL for selected sub-areas of SS10.
7. The magnitude of the farm dam impacts from SWMAs not included in the BDL estimate and the dam volumes permitted under State water management law at 30 June 2009 is significant and therefore warrants consideration and an improvement to the current estimate of the BDL.

Assessment of Available Spatial Data

8. South Australia requested the spatial data used to determine the BDL for SS10 to assist understanding of the basis for the calculations within the NWC report. The MDBA provided a Geoscience Australia spatial dataset, however, it was subsequently established that this data was not used to determine the reported farm dam interception impacts. It is understood that the data was provided by the former SA Department of Water, Land and Biodiversity Conservation. While it has not been possible to obtain the actual spatial information used, it is no longer considered necessary to pursue this further.
9. The Geoscience Australia spatial data is considered to provide an improved estimate of farm dam locations and surface areas than that used in the NWC report and subsequently

[1] Sinclair Knight Merz, CSIRO and the Bureau of Rural Sciences 2010, Surface and/or groundwater interception activities: initial estimates. Waterlines report, National Water Commission, Canberra.

for the Basin Plan. While the Geoscience Australia data set was finalised in February 2010 it is understood that the information was captured earlier and is therefore representative of the level of farm dam development at 30th June 2009.

10. The Department of Environment, Water and Natural Resources (DEWNR) holds farm dam spatial data (Topo Waterbody layer), which was compared with the Geoscience Australia data provided by the MDBA.
11. The analysis indicated that the DEWNR Topo Waterbody layer is more accurate in terms of farm dam count and surface area than the Geoscience Australia data. In general, the number of dams is higher in the DEWNR dataset but the total surface area of dams is lower.
12. The exception to paragraph 11 is for the portion of SS10 that lies within the SA Arid Lands NRM region. In this area, the Geosciences Australia data was considered more accurate. As a result, the farm dam information for this region within the Geosciences Australia layer was consolidated into the DEWNR dataset. This consolidated Topo Waterbody layer is now considered the best available farm dam information.
13. The analysis and comparison of the two datasets has been detailed in a technical report, which will be finalised and provided to the Authority with the draft WRP submission.
14. South Australia is proposing to use the consolidated DEWNR Topo Waterbody layer as input to the recalculation of the BDL.
15. It is also proposed to archive a copy of the DEWNR Topo Waterbody layer that is used for the recalculation of the BDL as the BDL baseline layer, which demonstrates the level of farm dam development at 30 June 2009. This BDL baseline layer can then be used by South Australia to monitor future farm dam development by comparison with the regularly updated corporate DEWNR Topo Waterbody layer. This will enable accurate management and reporting for SDL compliance into the future.

Proposed Approach

16. It is proposed that the BDL be revised based on the following (at 30 June 2009):
    - Farm dam capacity development limits under State water management law (*SA MDB Regional NRM Plan Vol. 3 – Regulatory and Policy Framework, April 2009*)[2] for defined sub-areas of SS10; and
    - Existing farm dams for the remaining SS10 area using the consolidated SA DEWNR Topo Waterbody layer, archived as the BDL baseline layer.
17. The NWC Report defined a method for calculating the long-term annual average interception effect of farm dams, as follows:

    Impact of dams (ML/year) = Sub-catchment dam capacity limits (ML) x 1.1

18. For areas with sub-catchment dam capacity limits under State water management law, the limits will be converted to a long-term annual average interception limit using the “Impact of dams” equation above.
19. For the remainder of SS10, the following is proposed:

[2] South Australian Murray-Darling Basin Natural Resources Management Board, (2009). *South Australian Murray-Darling Basin Natural Resources Management Plan - Volume 3 – Regulatory and Policy Framework*.

- For the farm dams identified in the DEWNR Topo Waterbody layer, the volume will be calculated using the surface area to volume relationships defined in McMurray (2004)[3]. This approach is consistent with the method used for determining farm dam volumes within the Eastern Mount Lofty Ranges WRP area.
- Farm dam volumes will then be converted to a long-term annual average interception limit using the "Impact of dams" equation above.

20. Total impact of dams for SS10 (from step 17 and 18) = revised BDL.

[3] McMurray D, 2004. Farm Dam Volume Estimations from Simple Geometric Relationships. Department of Water, Land and Biodiversity Conservation. South Australia. Report No. DWLBC 2004/48.
https://www.waterconnect.sa.gov.au/Content/Publications/DEWNR/ki_dwlbc_report_2004_48.pdf