

Northern Victoria Irrigation Renewal Project - Expert Review Panel

8 July, 2010

The Hon. Tim Holding
Minister for Water
121 Exhibition St
GPO Box 4509
Melbourne Victoria 3001

Dear Minister

Additional advice on environmental watering plans

The Minister for Environment and Climate Change has endorsed the Northern Victoria Irrigation Renewal Project (NVIRP) Expert Review Panel (ERP) and charged it with the responsibility to provide advice to NVIRP, the Minister for Water, and the Secretary of the Department of Sustainability and Environment (DSE) in relation to the relevant conditions in the decision of the Minister for Planning that an Environmental Effects Statement (EES) is not required for the NVIRP.

In response to Conditions 3 and 5 of that decision, and in preparation for carrying out its work program for the coming year, NVIRP produced eleven Environmental Watering Plans (EWP) and a revised over-arching reference document, the Water Change Management Framework Version 2 (WCMF), in the first half of 2010. The ERP advised, in a report to you on May 31, 2010, that these documents were acceptable and warranted your approval.

Approval of these documents is also required by the Commonwealth Minister for Environment as per approval conditions under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). As part of this process, the EWPs have been reviewed by officers of the Department of Environment, Water, Heritage, and the Arts (DEWHA). DEWHA has provided comments and questions for clarification to NVIRP as part of that process. These, together with NVIRP's responses, are presented in Attachment A. NVIRP has invited the ERP to comment on this material.

The ERP consists of three independent members, Denis Flett (Chair), Jane Roberts, and Terry Hillman. Mr Flett is currently overseas and unavailable to discuss these issues. The following comments, therefore, represent the views of Dr Roberts and myself, formulated after a briefing from officers of NVIRP, the North Central Catchment Management Authority, and the Department of Environment and Sustainability. Our conclusions are:

- The questions raised by DEWHA demonstrate a clear grasp of the relevant issues and also reflect the particular emphases embodied in the EPBC Act
- The responses furnished by NVIRP, which include clarifying comments and detailed explanations (see Attachment A) and additions and modifications to the

relevant EWPs, satisfactorily address the issues raised by DEWHA and accurately reflect the technical content of the EWPs and the philosophy and application of the WCMF.

We therefore commend to you the responses provided by NVIRP as satisfactorily addressing the concerns raised by DEWHA. We also endorse the revised EWPs subject to the inclusion of the additions and inclusions as outlined in Attachment A.

Yours truly,

A handwritten signature in blue ink, appearing to read "Terry Hillman". The signature is fluid and cursive, with a long, sweeping underline.

Terry Hillman,

Acting Chair

Northern Victoria Irrigation Renewal Project Expert Review Panel

Copy to:

Greg Wilson, Secretary of the Department of Sustainability and Environment

Murray Smith, Chief Executive Officer of the Northern Victoria Irrigation Renewal Project

Attachment A - Collation of comments/questions from DEWHA and responses

	Comment from DEWHA	Response
	Email 1	
1	For waterway EWPs based on environmental flow recommendations, the document explaining how the environmental flow recommendations relate to particular species / values should be at least included as an appendix.	<p>Environmental Flow Recommendations Appendix D added to the Loddon EWP - the FLOWS method is summarised, with a focus on how the method addresses threatened species / values as well as habitats and ecological processes. This appendix is referred to in the main document (sections 3.1, 5.1.3, 5.2.3 and 5.3.3) The same appendix and cross referencing will also be added to the Campaspe EWP.</p> <p>Section 5.5 of the Broken Creek EWP discusses the environmental flow recommendations that were developed by the GBCMA to support the Northern Region Sustainable Water Strategy. The section outlines a step by step process to determine the flow recommendations for the environmental values/assets (including MNES e.g. Murray Cod) on a month by month basis per reach and for each flow component.</p> <p>Table 8.1 further discusses the environmental values/assets, flow objectives, flow association, and how outfall reductions may impact on the flow recommendations and value/asset.</p> <p>No change proposed for the Broken Ck EWP</p>

	Comment from DEWHA	Response
2	<p>Further information should be provided as to how indicative outfall losses are predicted. The broad principles are clear, but how these principles are converted into a percentage indicative loss is not explained as far as I can see, with the result that the percentage figures appear rather arbitrary.</p>	<p>Indicative Losses</p> <p>SKM have provided further information on how the indicative losses were calculated. The losses are based on figure of 12 ML/year/km as per the SKM 2008 referral document (Appendix 15 in the PER). The rationale for this as follows:</p> <p>The 2008 SKM Study used empirical data for the Barr Creek catchment, which is in the lower Loddon catchment, to develop a relationship between the volume of loss from drains and hydraulic head between the invert of the drain and the groundwater (or gain to the channel if the water table is above than the drain invert).</p> <p>Whilst the 2008 study was based on data for the Barr Creek catchment, it covered a range of soil types ranging from light to heavy soils. It is thus reasonable to assume that the relationship developed for the Barr Creek catchment can be applied to other nearby catchments where soil types are not too different, such as other parts of the lower Loddon catchment and the lower Campaspe catchment. In the absence of site-specific information, the 2008 study was judged to be the best available information on losses in drains in the area and was therefore adopted for use to estimate losses.</p> <p>Depth to water table levels over the Lower Loddon and Campaspe study area were estimated to vary between approximately 2 to 4 meters below the surface in 2004/05. The outcomes of the 2008 study were used to estimate the loss per km of channel that would be expected to occur for a depth to water table of approximately 3 m (middle of the range) with a result of 12 ML/year/km (in 2004/05). For each outfall of interest, the fixed loss rate in 2004/05 was converted to a percentage loss, which was then applied for all years.</p> <p>This has been incorporated into the Loddon EWP, refer to Section 7.1.1 Table 17 - with additional comments providing a rationale for the indicative loss percentages. Similar text will be added to the Campaspe EWP.</p> <p>No indicative losses are calculated for the Broken Creek EWP as per Table 8-2 i.e. conservative assumption that all of the outfalls reach the waterway was adopted for the purposes of the analyses.</p> <p>No change proposed for the Broken Ck EWP</p>

	Comment from DEWHA	Response
3	<p>The relationship between the percent flow reduction tables (eg Campaspe Table 16) and the mitigation water assessment is not clear. For example, losses of up to 16% are considered not significant, which may be reasonable with further explanation but on the surface appear dubious.</p>	<p>Relationship between percent flow reduction tables and MW assessment</p> <p>Campaspe EWP - a note will be added below the mitigation table (Table 17) and be referred to in Table 22 Criteria 4.1. along the lines of:</p> <p>The hydrology assessment for Reach 4 (Table 17) indicates that during recent conditions there is a percentage reduction in flow of 16% during very low river flows (90th percentile, 60ML/month or approximately 2 ML/day). This indicates that outfalls contribute a greater proportion of flow during these very low river flow events. Given the very small volumes of water (2ML/d) in both the River and outfall, level of uncertainty in relation to model outputs and the low volumes of water compared to the volumes required to support Reach 4 environmental values this reduction during very low flows is not considered significant.</p> <p>Loddon EWP: Reach 4 and 5 of the Loddon EWP articulates the link between the Mitigation Water dependency assessment and the Hydrology Assessment. This is explained further in the text directly below (Tables 23 and 29).</p> <p>No change proposed for the Loddon EWP</p>
4	<p>It would be useful to include some more explicit information (or cross references to the WCMF) to indicate how the adaptive management framework will incorporate new data and correct any erroneous assumptions underpinning the hydrological modelling (for example) underestimated seepage impacts, overestimated outfall losses etc.</p>	<p>Adaptive management</p> <p>Explicit references to appropriate sections of the WCMF will be included in all EWPs. (Section 8)</p> <p>The adaptive management framework section is a generic section applied to each of the EWPs. It outlines the monitoring and reporting, review and adjustment components. The table provided in this section specifically states that 'Adjustment is determining whether changes are required following review or after considering any new information or scientific knowledge and making any design changes in an updated version of the EWP'. It is also stated that this will occur in 2010, 2015, 2020, 2025, etc. It is believed that this adequately outlines how the adaptive management framework will incorporate new data (including changes to the SWET modelling) and address erroneous assumptions. The EWPs also address this issue in the Potential Risks or Adverse Impacts section and corresponding appendix (Appendix I) where re-modelling is recommended as a mitigation measure for several risks/adverse impacts.</p>

	Comment from DEWHA	Response
5	I still need to discuss wetlands in a bit more detail with Leigh so I will have to get back to you again tomorrow. I'll also get back to you on Johnson Swamp early next week when I have discussed with Jim (out wetlands guy).	<p>Johnson Swamp</p> <p>The concern raised relates to the representativeness of the baseline year. As outlined in Section 3.11.2 of the PER and the Water Savings Protocol (Appendix 6b of the PER), the baseline year is the year adopted for operational purposes which is representative of long term average system operating conditions. It describes the average asset condition and operation condition of the system before it is modernised, following which improvements in asset condition and operation practices compared to the baseline can generate savings (and therefore can have environmental impacts). The PER and the WCMF has been approved by Commonwealth Minister for Environment.</p> <p>Notwithstanding the above, according to the adaptive approach outlined in Section 8 and the WCMF if the outfall numbers changes due to new information, the EWP will be revised accordingly to reflect the revised risk.</p> <p>No change proposed for the Johnson Swamp EWP</p>
6	Charmayne and I don't think any changes to the WCMF or the conditions are required as a result of not preparing EWPs for Little Lake Meran and Nine Mile Creek, so we will press on with approval of that one	No response required
	Email 2	
7	We would reiterate most of the comments I previously made on waterways EWPs, more or less, but with some additional comments / questions on the surface water balance modeling:	No response required

	Comment from DEWHA	Response
8	<p>For wetlands EWPs, information explaining how the desired water regime relates to particular species / values should be included as an appendix if possible. It seems that this information is primarily derived from "wetlands workshops" but the links are not always clear.</p>	<p>The process undertaken in identifying the desired water regime has been outlined in Section 5.2 and the accompanying table for each wetland EWP. The process is based on that recommended in the FLOWs method as outlined.</p> <p>Environmental values (habitat, species/communities and processes) were identified commencing with the short-listing process as described in the PER and the further through the development of the EWPs. This includes species of international and national significance.</p> <p>Ecological objectives (based on the environmental values) and their hydrological requirements were identified and are provided in the corresponding table. A range of indicator species have been provided in the table for each objective, where possible, with a focus on internationally and nationally listed species.</p> <p>A desired water regime was then determined based on the hydrological requirements of each objective (which as mentioned are based on specific environmental values). The values, ecological objectives, hydrological requirements and water regime were refined at a Wetland Workshop with agency stakeholders and technical experts (Appendix A).</p> <p>It is considered that there is adequate information included within the text on the process for determining the desired water regime. No changes proposed to the EWPs.</p>

	Comment from DEWHA	Response
9	<p>Further information should be provided as to how indicative outfall losses are predicted. The broad principles are clear, but how these principles are converted into a percentage indicative loss is not explained as far as I can see, with the result that the percentage figures appear rather arbitrary.</p>	<p>Indicative Losses for wetland EWPs</p> <p>Indicative outfall losses have been estimated in Step 2 of the Mitigation Water Assessment for those wetlands where there is a delivery channel following the discharge point (i.e. not direct outfall). This includes: McDonalds Swamp, Lake Meran, and Lake Yando. These calculations are also summarised in the accompanying table as recommended by Attachment G of the Water Change Management Framework. The percentage referred to in the text is calculated by dividing the outfall volume at the wetland by that at the origin. An example from Lake Meran is provided below:</p> <p>The baseline year (2004-05) outfall volume recorded at the regulating structure was 147 ML, refer to Section 4.1. The delivery or outfall channel to Lake Meran is approximately 1 km in length. An estimated 50 ML/km/irrigation year are lost from an open channel as a result of evaporation and seepage, based on knowledge gained from pondage tests and evaporation conducted as part of Stage 1 modernisation activities (pers. comm. Chris Solum [NVIRP], 27 January 2010). Based on conservative assumptions¹ relating to channel wetness when outfalls occur, and with an average fill time of approximately 115 days (based on 80 ML/day), the loss from the open channel in the baseline year is estimated to be 21 ML. Therefore, as much as 86% (or 126 ML) of this outfall volume is estimated as having contributed to the wetland's water balance in 2004-05.</p> <p>However, as Mitigation Water is calculated at the origin the indicative losses become irrelevant, except for those cases where the losses result in none of the outfall water reaching the wetland (e.g. Lake Yando). This is because it is Criteria 1.2 of the Mitigation Water dependency assessment.</p> <p>It is considered that the outfall losses associated with a delivery channel beyond the origin has been adequately addressed in the Wetland EWPs. No changes proposed in the wetland EWPs</p>

¹ These losses assume the channel is constantly inundated. Therefore losses may be more or less depending on the length of intervals between outfalls (pers. comm. Chris Solum [NVIRP] 30 March 2010).

	Comment from DEWHA	Response
10	It would be useful to include some more explicit information (or cross references to the WCMF) to indicate how the adaptive management framework will incorporate new data and correct any erroneous assumptions underpinning the hydrological modelling (for example) underestimated seepage impacts, overestimated outfall losses etc. It would also be useful to know how (if) the surface water balance model would feed into the adaptive management framework and vice versa (again particularly in relation to assumptions on groundwater that are used to inform the model).	Refer to response to comment 4
11	It should be explained why diversion / extraction is not factored into the surface water balance model - presumably authorised diverters would need to report on actual volumes diverted?	<p>The SWET model was used to provide an indication of the volumes of water required to provide the desired water regime. The hydrological regime was modelled in the absence of diversions to establish a 'base-line case' in providing environmental water to the wetland. Diversions past or future are not related to the fundamental hydrology of the wetland but will need to be resolved as a separate issue as part of the adaptive management of environmental flows in the future.</p> <p>No change proposed in the EWPs</p>
12	Finally, it is also not clear how the surface water balance modes relate to the desired water regimes, given that the model apparently deals with only a single target water level, yet the desired water regimes frequently involve wetting and drying regimes and / or varying water depths. Given this apparent discrepancy it is not clear to me what purpose the surface water balance model serves.	<p>A single target level for most of the wetlands (excluding Lake Yando) has been identified for each SWET model. This target level is the height of desired inundation and corresponds with the desired water regime. For some wetlands this provides the volume of water required to maintain inundation at that target level (i.e. Round Lake and Lake Meran) while for others it provides the volumes required to reach that target level in the defined cycle (i.e. Lake Leaghur: fill to 85.85 m AHD 1 in 3 years). Appendix G graphically illustrates how the desired target level and water regime are achieved. Lake Yando is a different case in that there are two target levels over 6 years (i.e. fluctuating water levels). This has been modelled accordingly.</p> <p>No change proposed in the EWPs</p>
13	Not sure Leigh and I entirely understand the role of the surface water balance model. Can we call someone to discuss early next week?	Refer to response to comment 11.