

Northern Victoria Irrigation Renewal Project Water Change Management Framework



Advice from the
NVIRP Expert Review Panel
to the
Minister for Water

11th August 2009

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1. INTRODUCTION

1.1 This Advice

This advice relates to the Water Change Management Framework (WCMF).

1.2 Context

Although our knowledge of the water cycle across northern Victoria is far from complete, it is clear that several factors have recently contributed to creating a much drier landscape than the region has otherwise experienced in modern times. They include:

- on-farm improvements in water application and drainage generation;
- improvements in infrastructure and water delivery management;
- current extended drought conditions.

Climate change and further infrastructure and service modernisation, in particular roll-out of the Northern Victoria Irrigation Renewal Project (NVIRP), are likely to result in further loss of water in the landscape and in particular to the regional waterways and wetlands. Not all of this loss is detrimental. Removal of unseasonable incidental irrigation water to the environment can result in a more 'natural' hydrological regime. Where NVIRP modernisation presents a potential risk to wetlands or waterways of high environmental value a proportion of the water savings from that activity, termed "mitigation water", may be reserved to alleviate that risk.

1.3 Role of Expert Review Panel

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

Condition 2 of the decision determined that:

"NVIRP must appoint an Expert Review Panel, the membership and terms of reference of which are to be endorsed by the Minister for Environment and Climate Change, to provide advice on hydrological and related ecological changes due to the implementation of NVIRP".

The ERP was established in late June 2009 and met on several occasions since the beginning of July 2009 to review the matters required as set out in the conditions specified by the Minister for Planning in his decision regarding EES. Table 1 lists the documents that the ERP is required to review and for which it is engaged to provide advice at this time. Other documents and matters are scheduled for later consideration, and the ERP will, in due course, provide written advice on these.

Table 1: Documents for ERP Review

Condition	Document	Expert Review Panel role	Approval	Timing
3	Water Change Management Framework.	Review of draft NVIRP documentation and written advice to NVIRP and relevant agencies.	Minister for Water, following review and written advice from the Expert Review Panel and following consultation with the Minister for Environment and Climate Change.	Before operations of relevant works commences.
3	Environmental Commitments – WCMF	Final advice to Minister for Water to be made publicly available.		
3	Processes, methodologies and procedures – WCMF			
5	Short-listing Reports for waterways and wetlands.	Review of draft NVIRP documentation and written advice to NVIRP and relevant agencies. Final advice to Secretary, DSE to be made publicly available.	Secretary, DSE following advice from the Expert Review Panel.	Before operations of relevant works commences.
5	Environmental Watering Plans.	Review of draft NVIRP documentation and written advice to NVIRP and relevant agencies. Final advice to Minister for Water to be made publicly available.	Minister for Water following advice from the Expert Review Panel.	Before operations of relevant works commences.

1.4 Purpose, Scope and Application of the Framework

The WCMF addresses impacts of modified hydrological regimes on aquatic and riparian ecological values as a result of changed irrigation system design, resulting directly from the operation of NVIRP’s works.

The overall purpose of the WCMF is to describe the means by which the NVIRP will protect aquatic and riparian ecological values through management of water allocations and flows that may be impacted by implementation of NVIRP within the modernised Goulburn-Murray Irrigation District (GMID). The WCMF applies to how NVIRP will:

- develop the operational requirements for managing the ecological consequences of hydrological changes arising from the implementation of NVIRP;
- establish the future operational requirements to achieve agreed environmental performance requirements, including transfer of responsibility to appropriate organisations; and
- describe how the ecological consequences of hydrological changes arising from the implementation of NVIRP will be monitored, reported and adjusted through an adaptive management approach.

The WCMF provides the environmental commitments, processes and methodologies for the relevant operations of the modified system.

1.5 Process for Expert Review Panel Review

The ERP's advice is based on the "Final Draft 31 July 2009" version of the document. This advice is submitted to the Minister for Water on the understanding that comments from the ERP regarding report structure, formatting and editorials will be thoroughly addressed in the WCMF Report which is to be submitted by NVIRP on the 11th August 2009, together with this advice.

The WCMF was developed jointly by NVIRP and the Department of Sustainability and Environment (DSE). The involvement from DSE was to provide confidence in the application of the key policy and legislative commitments being made within the document. The ERP received a presentation on the WCMF on 6th July 2009. Since then there have been three iterations of the document incorporating refinements based on feedback from agencies and stakeholders, including from the ERP.

1.6 Criteria Assessed by the Expert Review Panel

The criteria used by the ERP to review and provide its advice on the WCMF are based on the directions given in the decision of the Minister for Planning that no EES is required for NVIRP, and the Terms of Reference for the ERP.

The overall adequacy of the WCMF in meeting the Minister's requirements was assessed through:

- (i) Completeness of the Framework in addressing Condition 3
- (ii) Appropriateness of the environmental commitments
- (iii) Adequacy of the processes and methods for:
 - a. Assessing hydrology
 - b. Assessing ecological value
 - c. Assessing ecological risks
 - d. Short-listing for Environmental Watering Plans
 - e. Preparing Environmental Watering Plans
- (iv) Soundness and reasonableness of the procedures for monitoring, reporting, and auditing changes in hydrological and ecological conditions
- (v) Consideration of the Framework in perspective.

2. OVERALL ADEQUACY OF FRAMEWORK

2.1 Completeness of the Framework in Addressing Condition 3

The ERP recognises the rapid evolution of experience and knowledge associated with irrigation system modernisation, environmental water management, water savings estimation techniques and associated adjustments to the water entitlement and allocation regime. It is also recognised that the modernisation program and its works are dynamic and occurring in an adaptive management environment; therefore the Framework must be a living document capable of evolution to fit its purpose. The time pressures on developing this Framework are also acknowledged.

The ERP supports the adaptive management approach and the quest for continuous improvement which is built into the Framework, including through review mechanisms outlined in Section 19. The soundness of any changes to the Framework being subject to the review processes and approval as specified in the current Framework is also supported.

The ERP notes that NVIRP will need to be alert to substantive changes that may arise and trigger the need for a review of the Framework. It is understood that the auditing provision in Section 18 of the Framework is a good example of this need and may trigger a review before the regular 2 year timeframe stipulated in Section 19 of the Framework.

The ERP considers that the processes outlined or referred to within this document are generally adequate but it considers that further development is required for some of the methods. Details are given later in this advice.

It is not clear how assessments for groundwater or seepage dependent ecosystems are going to be undertaken. The ecological importance of these has been recognised only relatively recently and relevant methods are new or under development¹. The appropriate document, where these methods are relevant, is the overarching Groundwater Assessment Report, which is yet to be prepared.

The ERP expects that there will be a requirement to revisit the short-lists of wetlands and waterways, once the Groundwater Assessment Report is completed and this adaptive management is provided for within the Framework.

The roles and responsibilities of the various agencies involved are clearly set out in the Framework as is the facility to adapt, for example as a result of any restructure of the agencies involved, as is necessary throughout the project implementation period.

2.2 Appropriateness of the Environmental Commitments

The ERP is of the view that the principles outlined in Section 9 of the Framework are appropriate to guide the processes and methods necessary for project implementation and modernised infrastructure operation, subject to some simplification and clarification in line with feedback provided. There may also be a need to refine the articulation of the principles based on experience or any change of scope of application of the Framework as a part of the adaptive management approach. In line with this approach, and during the roll-out of modernisation, a process may be needed through which new environmental information (from, e.g. CMA or DSE surveys) can trigger the revision of an asset's environmental value status, the provision of mitigation water, or other aspects of an EWP.

The ERP is of the view that the (first) commitment, to *“Manage the ecological consequences of hydrological changes arising from implementation of NVIRP, including to avoid any diminishing ecological values in wetlands and waterways”*, provides a sound statement of intent.

It is noted that the Performance Requirements dealing with aquatic ecosystems (Items 1.4 and 1.5, Table 10, WCMF) place a heavy emphasis towards listed threatened species and similar values, notwithstanding the earlier reference to broader environmental values (Item 1.2). This emphasis is dependant on the assumption that all wetlands and waterways have been

¹ See for example, Eamus et al, 2006, *“A functional methodology for determining the groundwater regime needed to maintain the health of groundwater-dependent vegetation”*, Australian Journal of Botany, 54, 97-114.

satisfactorily surveyed for these species and tends to undervalue a wider range of organisms and ecological processes and function. When these are considered collectively and in conjunction with statements about environmental values given elsewhere in the Framework, there is a disproportionate emphasis on formal and legislated obligations specifically those to do with listed species, and not enough on the processes that sustain wetlands and waterways as ecological systems and maintain their character and landscape function.

The ERP is of the view that the (second) commitment to “*Establish arrangements for the sourcing, allocation and management of water required to mitigate the project’s potential ecological impacts*” is appropriate.

The performance requirement for “Sourcing and allocation of water” makes provision for mitigation (or requisite) water to be sourced and allocated in accordance with the Water Savings Protocol through defining the attributes of mitigation water. This performance requirement for mitigation water is considered to be an appropriate means of making the commitment effective, particularly given that mitigation water is, by necessity, to be taken into account in the process of determining water savings and sequentially is to be determined ahead of water savings.

The performance requirement for “Management of water” with its references to documented operating arrangements in relation to the deployment and administration of mitigation water is also considered to be an appropriate means of making the commitment effective.

2.3 Adequacy of the Processes and Methods

2.3.1 Assessing Hydrology

The ERP is of the view that the hydrological connections other than channel outfalls were not appropriately considered or explained within the processes outlined in the WCMF and the associated documents. As such, it may be necessary to review in the future the short-lists of wetlands and waterways to consider a broader suite of hydrological connections in the NVIRP area. The appropriate opportunity for such a review to consider groundwater and seepage impacts is following the completion of the Groundwater Assessment Report and the Regional Environmental Assessment.

The guidance in the Framework in relation to the process for the establishment of the requirement for mitigation water including guidance for how this is to be done in EWPs would benefit from some review and clarification. The methods to define the attributes of mitigation water which are referred to in the Framework are not yet adequately developed. Incorporation of the methods to define the attributes of mitigation water in the Water Savings Protocol is supported. Whilst not subject to review by the ERP the Water Savings Protocol has been read and is considered to be rigorous, appropriately conservative and adaptive. The attributes that need to be covered in the methods to define mitigation water may include: quantification; reliability or variability; the significance of the baseline year in relation to representativeness for ecological conditions and long term equivalence; status, as in interim or enduring; flexibility, such as ability to carry over; and the administrative form, or where it is to sit within the bulk entitlement.

The ERP is satisfied that the guidance provided via the Framework and in the Water Savings Protocol is adequate for determining interim provisions for mitigation water as part of an Interim EWP.

2.3.2 Assessing Ecological values

The process used for identifying ecological values, and hence for determining which systems have high environmental values, tends to result in a strong reliance on data in the form of species records. Treating the number of listed species as a measure of environmental value confuses legislative obligation with ecological values.

The ERP recognises that the pace of work since the Minister's conditions were announced in April and its scale, dictated the types of approaches that could be used and forced a reliance on databases. It notes the value of accessing a broader base of information, including informal and local knowledge, as was utilised in the short-listing reports and the EWPs, and suggests an equivalent process when groundwater dependent and seepage dependent ecosystems are considered.

The ERP also notes that the understanding of what constitutes environmental values is strongly coloured by site-scale perspective. The physical inter-connectedness of aquatic systems, their ecological interdependencies and exchanges, and their regional functions are challenging issues to be dealt with within the Regional Environmental Assessment. The development of the Regional Scale Assessment scope and process is recommended to be initiated prior to conclusions being made about the EWPs within 2010.

2.3.3 Assessing Ecological Risks

Ecological risks are considered at two points in the Framework, within the development of an Interim EWP and the preparation of an EWP.

In the case for an Interim EWP, the Framework refers to risk criteria currently in use by DSE for prioritising environmental water. The risk approach outlined in the Framework to guide the Interim EWPs is appropriate. The process highlighted for the "risk based approach" (Section 15) does not include a complex risk assessment process. It is recognised by the ERP that a comprehensive risk assessment is not necessary for this and that various risk mitigation steps have been taken which are more appropriate. These methods include;

- inclusion of the TAC;
- community consultation; and
- workshops with specialists.

The ERP believes that the criteria proposed within the Draft Northern Region Sustainable Water Strategy that are currently being developed, offer a more comprehensive approach than the current criteria and could be considered for planned Interim EWPs and EWPs in 2010.

In the case of developing an EWP, no risk analysis is prescribed. As such, consideration of risks is limited to considering adverse impacts and possible mitigating actions. This is considered appropriate.

Part of the overall risk management approach is to include, through the short-listing process wetlands/waterways, where there are unknowns. This is considered appropriate.

It will be difficult to establish ecological risks for groundwater dependent ecosystems and seepage dependent ecosystems. Further consideration should be given to this complex issue and the appropriate approach to be used, including a referral in the Framework to guidance to be developed.

There is a risk that potential environmental outcomes will be incorrectly linked to NVIRP efficiencies (either positively or negatively). The risk could be reduced by incorporating appropriate statistical controls into the monitoring program by tracking condition and status at un-impacted sites. The ERP considers that, in addition to the risks specified in the Framework, there are a number of risks attendant upon the whole process. These are presented below (Section 2.5).

2.3.4 Short-listing process for Environmental Watering Plans

The ERP is of the view that the process outlined in the WCMF is adequate.

The process is definitive about wetlands and waterways that need an EWP due to an adverse affect, but is less clear regarding those for the other cases, i.e. beneficial effect, no effect and uncertainty regarding hydrological effect. The ERP is of the view that this is worthwhile consolidating and clarifying in Section 14 of the Framework.

2.3.5 Environmental Watering Plans

The ERP is of the view that the Framework, notwithstanding difficulties in development because of complexity and time constraints and the need for some further development, when combined with the initiative of NVIRP and the North Central Catchment Management Authority (NCCMA), has provided adequate guidance for the Interim EWPs to apply for 2009-2010 irrigation season and for the Johnson Swamp EWP where there is no case for mitigation water.

The process undertaken by NVIRP and the NCCMA was more appropriately weighted, in terms of effort, than is provided subsequently in the Framework. The minimum content guidance does not adequately reflect the process that was undertaken, which was appropriate.

The ERP considers that the minimum content guidance needs to be updated and that consideration could be given instead to the development of a standardised template for these documents rather than referring to a minimum content schedule (such as is provided in Attachment E). On review of the guidance for EWP development in the Framework the guidance could be updated such that:

- sequencing reflects what has been undertaken (process and structure) by the NCCMA.
- a means for maintaining an appropriate level of scientific rigour is outlined.

The appropriate time for such updates is prior to the establishment of the EWPs required in 2010.

2.4 Procedures for Monitoring, Reporting and Auditing Changes

The ERP considers it is important that monitoring, auditing and reporting provisions are clearly linked to adaptive management and review processes. The ERP notes that NVIRP will need to be alert to substantive changes that may arise and trigger the need for a review of the Framework. It is understood that the auditing provision in Section 18 of the Framework is a good example of this need and may trigger a review before the regular 2 year timeframe stipulated in Section 19 of the Framework.

The flexibility provided in the Framework whereby both the Groundwater Assessment and the Regional Environmental Assessment can feedback to site specific EWP developments and further short-listing is a sound approach, notwithstanding that the actual methods of these assessments are still to be developed.

Relevance of internal audit and inspections do not at this stage relate specifically to the WCMF. However, these links could be developed over time, therefore this element of the report needs to be specifically considered in the adaptive management of the document

2.5 Framework in Perspective

The intent of the Framework is to consider all forms of hydrological connection.

A limitation identified is the restricted definition of hydrological connection used in the short-listing reports. It is understood that the overall Groundwater Assessment will identify site specific issues for both groundwater and seepage dependent ecosystems and groundwater and seepage dependent wetlands and waterways which are impacted by reduced recharge and regress due to NVIRP modernisation.

The ERP notes that for wetlands, there are risks associated with adopting the starting point for the WCMF, being the SKM Desktop Assessment. The Desktop Assessment carried out its evaluation sequentially, assessing environmental value first then assessing hydrological characteristics only for those sites deemed to have significant environmental value. This meant that a very large number of sites had to be assessed for environmental value (e.g. greater than one thousand wetlands) limiting the primary basis for evaluation to information already available and resulting in assessments heavily dependent on the existence of Ramsar-type international agreements and listed sightings of threatened species. Although ameliorated to some extent by workshops and regional consultation there is still some residual risk that ecologically important assets may not be assessed hydrologically through lack of knowledge.

Consideration should be given to the need for external integration of this document with other key Government documents such as the Water Savings Protocol and the Northern Region Sustainable Water Strategy.

It is desirable for the Regional Environmental Assessment to be considered concurrently with the development of the EWPs rather than after, as indicated in Section 17 of the WCMF. This Regional Environmental Assessment should address a wider suite of ecological values due to interdependencies of these two assessments.

3. CONCLUDING ADVICE

The ERP notes that the three part structure of the Framework is aligned with and addresses the Minister's conditions. The ERP believe that the package (including all the documents within the Framework) does address the primary aim which is *"protection of aquatic and riparian values through management of water allocations and flows within the modified GMID system"*.

Unplanned negative outcomes represent a significant potential threat to the modernisation program and similar future developments and the chance of their occurrence must be minimised. The risk of adverse impacts due to hydrological changes, on environmental assets not identified in the short-listing process or of incorrect remedial action being prescribed in EWPs will need to be managed through targeted monitoring and management responses as part of an effective adaptive management framework.

Expert Review Panel Advice on the Water Change Management Framework

The ERP believes that the Framework and associated documents represent an excellent first step in ensuring that the NVIRP remains environmentally benign. Further refinement in defining mitigation water, accounting for all hydrological threats from NVIRP modernisation, and in establishing strong feedback loops as part of a monitoring program will continue to strengthen this position.

It is the advice of the ERP that the documentation that has been prepared by NVIRP is acceptable and warrants being approved.

In addition the ERP advises that the key priorities for development, before the 2010-2011 irrigation season, should be:

- Establishment of the methods for defining the attributes (sourcing and allocation) of mitigation water and incorporation into the Water Savings Protocol. It is recognised by the ERP that this responsibility lies with DSE rather than NVIRP.
- Completion of revisions to the WCMF and ensuring that the WCMF is ready to use.
- Initiation of the scoping and outlining of the process for undertaking the Regional Environmental Assessment.
- Finalisation of the Groundwater Assessment Report. Findings and implications relating to wetlands, waterways and groundwater-dependent ecosystems, are to be drawn out and ready to be activated.
- Updating of the short-lists of wetlands and waterways in response to the Groundwater Assessment Report including any update of methods.
- Development of a process or provisional methods for the assessment of the groundwater or seepage dependent ecosystems.

Notwithstanding the requirements for future work, the NVIRP documents provide an adequate response outlining the means by which the NVIRP will protect aquatic and riparian ecological values through management of water allocations and flows that may be impacted by the operation of the modernisation works undertaken by NVIRP in the GMID within the 2009-2010 irrigation season. The ERP believe that the Management Review provisions outlined in the WCMF are appropriate in ensuring continual improvement.

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