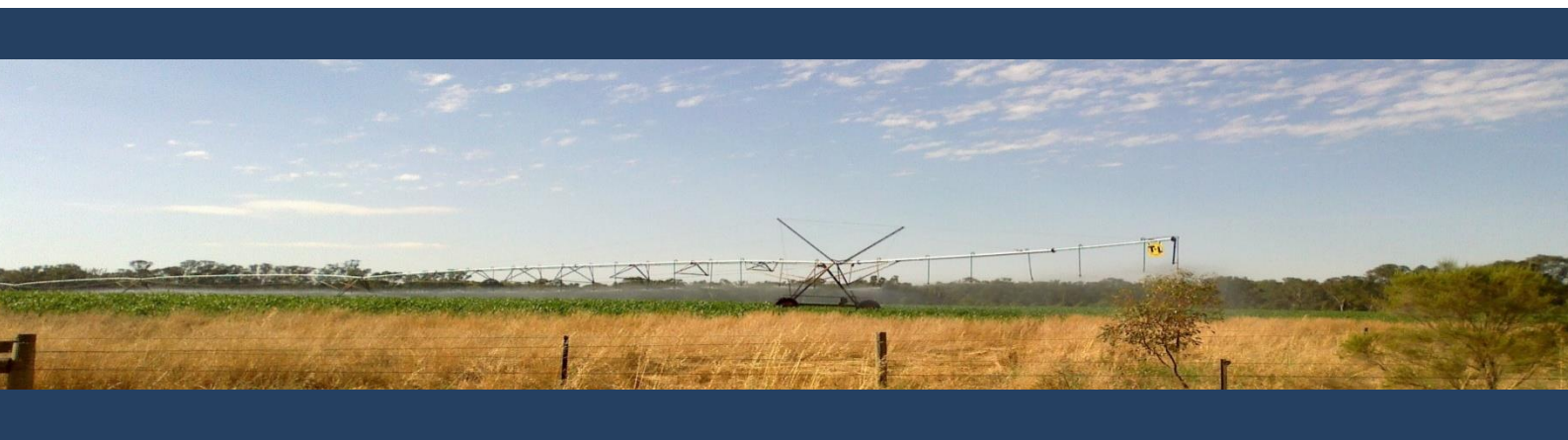


Field Trial of the Australian Water Stewardship Standard (Version 2) with the Dairy Industry in the Goulburn Broken Catchment

Final Report

DECEMBER 2012



Prepared by **Water Stewardship Australia Limited** in cooperation with **Tatura Milk Industries**, **Dairy Australia** and the **Goulburn Broken Catchment Management Authority** with support from the **Murray Darling Basin Authority**



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Version control

Version	Release	Circulated to	Response
1	26/10	Project Team	31/10
2	2/11	Reference Group	13/11
2a	7/12	Reference Group	12/12
3	7/1	PF and CM	11/12
3a	11/1	Reference Group	15/1

Project team

Reflecting the various interests in the trial, a project team was established comprising the following people:

- Michael Spencer (WSA/Consultant)
- Kevin O'Grady (Consultant)
- Marc Assefpour-Dezfuly (WSA)
- Claire Miller (Dairy Australia)
- Stu Brown (TMI)
- Lisa Menhenett (TMI)
- Pat Fehan (GBCMA/Consultant)

Reference group

A Reference Group was established for the project that included a broader range of people from the Dairy industry and the CMA. In addition to those mentioned above the reference group included:

- Chris Norman (GBCMA)
- Carl Walters (GBCMA)
- Jeff Odgers (Murray Dairy)
- Geoff Ruddle (Parmalat-Riverina)
- Jack Holden (Fonterra)
- Helen Dornom (Dairy Australia)
- Hayley Collins (GMW)
- Wendy Brown (Parmalat Australia)
- Craig Baldwin (Murray Goulburn Cooperative)
- Catherine Phelps (Dairy Australia)

The Reference Group met three times, at the start of the project, after the assessment regarding how best to engage farmers in water certification and at the conclusion of the project for consideration of the final report.

Summary and key points

The Goulburn Broken Catchment faces significant challenges. It has strong economic demands from intensive agricultural industries and it includes two highly stressed river valleys¹ within the Murray Darling Basin. The dairy industry is one of the largest industries in the Catchment and one of Victoria's largest exporters. As well as being scrutinised by local stakeholders, the dairy industry is facing emerging customer pressure to verify sustainable practices at a time when farmers and milk processors are already dealing with a growing compliance burden.

The Project

This project was the most extensive trial of any Australian Water Stewardship Standard undertaken to date. It involved Dairy Australia, the Goulburn Broken Catchment Management Authority (GBCMA), local farmers and Tatura Milk Industries (TMI). For the purpose of the trial, TMI was the 'enterprise' being evaluated and its milk suppliers, about 280 dairy farms in the Shepparton Irrigation Region (SIR) of the Catchment were the focus for evaluating 'indirect' water use.

WSA acknowledges the leadership shown by TMI without whose cooperation (including staff time), this trial would not have been possible. This was not an audit of TMI but a testing of the Standard within their operations and supply chain. The contribution of Dairy Australia, whose staff were part of the project team, is also recognised, as is the ongoing support of the GBCMA and Murray Darling Basin Authority (MDBA).

Project goals

The goals for this field trial were:

- To demonstrate that a water stewardship system could add value for both the catchment manager in balancing competing demands and the dairy industry in dealing with its compliance costs and stakeholder relations;
- To see how the *Draft 2 Australian Water Stewardship Standard* (the Standard) could perform in response to these needs and its usefulness as a conformity assessment tool; and
- For the project sponsor, the MDBA, to further investigate if a voluntary conformity assessment program such as water stewardship could drive uptake of Best Management Practices (BMPs) in the Basin.

The Standard

The Standard is based on five principles of Water Stewardship:

1. Water flow regime;
2. Water quality;

¹In making this observation based on, for example, the 2007 Sustainable Rivers Audit, two points should be noted: (1) the audit was undertaken in the depths of one the worst droughts recorded for the Catchment and; (2) finalisation of the Murray Darling Basin Plan will provide additional environmental flows to the river (see discussion in body of report).

3. Protection and restoration of important water-related sites and values;
4. Responsible participation in catchment governance; and
5. Infrastructure maintenance.

The methodology for evaluating performance against the Standard starts with an overview of catchment issues in the context of the five principles. It then establishes locally applicable goals and measures for performance such as goals for managing indirect water use (in this case, farmers supplying the factory), a three-year action plan and a monitoring, reporting and evaluation program for the water steward.

This report reviews performance of the Standard in this trial against the five principles of Water Stewardship; the application of the Standard to the enterprise and the industry (indirect use) and, auditability of the Standard.

Flow regime

WSA understood that consideration of flow regime would be problematic. A default measure of plus or minus 20 per cent of historic natural flow had been proposed internationally and while the simplicity of this measures was appealing, the reality became more complex given the variability in Australian surface water flows. A few observations are relevant here:

- Historical flow is complex and multi-faceted. Flow targets developed by the GBCMA for the Victorian Environmental Water Holder (VEWH) illustrate the complexity involved in setting flow targets to take account of seasonal conditions, seasonal flows and reaches of the river;
- Demand for irrigation water means that natural flows in the Goulburn are effectively reversed (high flow in summer compared to natural condition of low flow in summer) and 50 per cent of flow, on average, is abstracted;
- Water in the Goulburn is allocated initially at a basin level (MDBA), based on this allocation, state governments make bulk allocations and large users receive an entitlement from bulk water managers. Users along the river are at the end of the decision-making tree not the beginning.

Is it possible to be a good water steward in this context? For WSA this presents a dilemma in that the Standard needs to demonstrate that it can generate real catchment level impacts and outcomes to be credible while, on the other hand, it needs to be inclusive and accessible to a wide range of potential participants (particularly those in stressed catchments) to be effective. WSA (and AWS) have worked from the view that it is better to encourage good operations within highly stressed catchments than set up a system that effectively excludes participation from organisations working in such catchments.

Consideration of these issues led to the following **recommendations** for future standards:

- Flow regime cannot be considered just in isolation but should be seen as interlinked with governance (subject to comments made later) and the Special Sites and Values Principle; and

- There should be a stronger focus on outcomes that result from an appropriate flow regime rather than flow *per se*. This approach should stress the interaction between water and the natural environment over time rather than just the annual volume flowing down the river.

This means that a good water steward will encourage both adequate flow and appropriate allocation to the environment based on achieving stakeholder agreed, scientifically validated, outcomes. As an example, this may mean working with local authorities to ensure flow rates are adequate to maintain and improve riparian and wetland conditions through periodic overbank flooding.

Groundwater is a major consideration for this catchment because of the salt load carried in the groundwater system and the impact of salinity on pasture and productivity. There is widespread awareness of the need to keep groundwater levels below the root zone of pastures and strong economic drivers. There is mutual interest in achieving groundwater targets although it has been noted more research is required on the interaction between surface and groundwater. Causes, impacts and solutions to groundwater issues may relate to different or broader geographic space (and sphere of influence) than surface water issues.

Recommendation:

- The Standard to this point has mainly focused on groundwater as a consumptive use issue and needs to consider whether specific goals are required for dealing with salinity issues; and
- The Standard needs to be able to deal with different geographic space (and sphere of influence) issues that may be relevant to dealing with the causes, impacts and solutions to groundwater issues such as salinity.

Quality targets

The trial showed that there were adequate resources and mechanisms for monitoring and reporting water quality within the catchment and sub-catchment. A network of monitoring stations is maintained and quality targets are set by government agencies: the Environment Protection Authority (EPA) through the State Environment Protection Policy (SEPP); the Murray Darling Basin Authority (MDBA) monitors salinity targets set by the *Water Act (Cth)*, and; the State Department of Environment and Sustainability (DSE) has recently finalised a report on setting irrigation drainage quality targets for the Goulburn-Murray Water region². Individual processing facilities, wastewater facilities, landfill sites etc. are responsible for ensuring their activities do not impact on surface or groundwater and this requires them to develop and implement a monitoring program that enables them to demonstrate no impact.

The limitation of this system rests with the monitoring of compliance against these guidelines at a regional or catchment level. This may be due to; resource constraints of the monitoring agency, high-level targets (such as broad salinity targets monitored by the MDBA), the impact of extreme events such as drought (when some monitoring appears to have been suspended) or, lack of enforcement (SEPP).

²DSE (2012). Irrigation Drainage MOU. Determination of processes for setting resource condition water quality and other targets AND Defining risk response thresholds and drainage catchment prioritisation processes. Final Report. RMCG and Feehan Consulting., Department of Sustainability and Environment.

Observations:

- The MDBA, CMA and water authorities can play a role by providing clear, concise, relevant and regular advice on best practices and performance in the sub-region;
- Growers and processors can play a positive role in ensuring the system works by participating in water governance opportunities either directly or through their community or industry association; and
- Seasonal conditions play a big part in quality performance of surface water flows (i.e. drought/flood will influence relative concentrations/loads).

Recommendation:

- The analysis highlights the relationship between the Water Quality Principle and the Governance Principle in the Standard. This relationship should be further developed in future iterations of the Water Stewardship Standard; and
- The Standard should consider a longer term, potentially a five-year view of quality measures that will overcome the peak and trough effects of seasonal conditions such as drought and flood.

Special sites and values

The Special Sites and Values Principle is both a goal and an indicator of whether a good flow regime is being achieved. However, even in a catchment with good management, reporting on special sites and values tends to be at a high level. In the Goulburn Broken, for example, this is in terms of kilometres of river in certain zones and recognised wetlands. Beyond these high level measures, enterprises may or may not know what is expected of them as good water stewards. For example, maintaining bogs and wetland areas on a farm or a plant site or an ephemeral creek through a district.

Recommendation:

The Standard needs to encourage and reward close cooperation with catchment managers to achieve overall improvement in ecosystem health and cultural assets. This points to the need for close integration of this principle with the Governance Principle and the importance of good water stewards participating in catchment governance.

There are likely to be several levels of engagement for enterprises. For example, an enterprise that fulfils its obligations in terms of recognised special sites is acting responsibly, while one that, for example, participates in improving ecosystem health through restoration of wetlands or riparian areas beyond its immediate obligations deserves special recognition. This special recognition may be by, for example, opportunities to earn 'innovation points' (as per the LEED Green Building program) toward certification (or a level of certification if a gold, silver bronze system is adopted as proposed in the AWS Standard).

Recommendation:

Rewarding leaders and innovators (particularly in the protection and enhancement of special sites and values) could be an important addition to the Water Stewardship Standard.

Infrastructure

The field trial has shown that the manner in which infrastructure has been included in the Standard does not relate to circumstances within the Goulburn Broken. The Standard appears to expect that all households will be connected to sewage and safe drinking water systems. This does not happen in rural parts of Australia where property owners generally provide sewage and drinking water. Equally the Standard needs to account for the fact that service providers manage infrastructure systems.

Recommendation:

The Standard should focus on infrastructure for the efficient use of water within an enterprise and participation by entities in catchment governance to promote the provision of infrastructure for the region that is adequate for the task, sound and efficient and, well maintained (as described in the Infrastructure Principle).

Governance

The Governance Principle in the Standard relates mainly to the nature of institutions within a catchment and the level of stakeholder participation. Where institutions and opportunities for stakeholder involvement do not exist (as was the case to some extent with the Lake Naivasha trial in Kenya), good water stewards have a role in encouraging the establishment of those institutional arrangements. In the Goulburn Broken, those institutions do exist. Here, the role of a good water steward is to be involved with those institutions, either directly or through a community or industry group, and use that involvement to achieve outcomes for the catchment in line with the Principles of Good Water Stewardship. So a good water steward in a well-run catchment should be able to point to where their organisation engages with the governance system and how they are promoting good water stewardship.

This trial highlighted the relationship between each of the other four principles (flow regime, quality, special sites and values and infrastructure) and the Governance Principle. Outcomes for each of those principles were influenced or driven by a government (Federal, State or Local) or an agency with broader basin-wide or regional responsibilities (or a combination of all of the above). However, each of those governments or agencies (and the CMA) offers opportunities for stakeholder input (although rarely stakeholder determination). That input may be provided as an individual, as a community group or as an industry.

Recommendation:

A crucial role for the Standard, and one that needs further development, is to create a test for whether the enterprise is engaging with governance opportunities in a way that promotes outcomes for the catchment in line with water stewardship principles (accepting this may not always be successful).

Where those governance opportunities do not exist, the Standard needs to test whether the good water steward is contributing to their establishment.

The Enterprise and Indirect water

For this trial each element of the Standard was tested against local conditions either in the Catchment generally or within TMI operations. It was found that evaluation of TMI processing operations was relatively straightforward. Issues relating to water consumption and quality were well understood; the relationship with infrastructure providers was clear although the relationship to the Governance Principle and Special Sites and Values was less well understood. The most challenging issue was the requirement relating to indirect water use by the enterprise. This was for two reasons.

Observations:

- Embedded water as proposed by the Standard is a concept likely to involve substantial additional work at a site level. Experience from this trial would suggest that enterprises know the water content (approximate if not precise) of major inputs but not the breakdown of that water (green, blue etc.).
- The main indirect water use for TMI was the water consumed by its 280 dairy farmer suppliers. These range in size and capability. In general, they are small businesses for whom compliance with a new standard would be a significant additional task that would be resisted in the absence of a clearly understood and demonstrable benefit to their operation.

In relation to the first point, **it is recommended:**

The Standard provide for a phasing of the concept of embedded water. The first phase would be to understand major water consuming inputs and engage providers of these inputs (in this case dairy farmers) through a risk-based methodology (as currently proposed in the Standard). At higher levels of accreditation it may be possible to introduce more sophisticated analysis of indirect water use and to include lower water intensive inputs.

In considering the second point, a special sub-group was established and elements of the Dairy Australia Self-Assessment Tool (DairySAT) were reviewed, whole farm planning was tested as a vehicle for gaining the involvement of individual farms and, group certification was reviewed as a tool for lowering compliance costs for operations with similar characteristics. As the trial coincided with discussions between TMI, Dairy Australia and a major international customer over a proposed sustainable agriculture code this created a focus for the discussion that, in the end, was quite helpful in clarifying the role of the Standard and certification processes.

A model for simplification of verification and compliance

The solution proposed was that the Standard mediates between customer expectations and industry performance by establishing a set of global norms and a credible compliance regime. The Standard can play a role aligning industry BMPs and catchment strategy with global norms. Individual farmers can be engaged, through a respected intermediary such as the dairy factory, on the basis of a template farm management plan that incorporates all of the above as well as other necessary compliance requirements. This allows a range of requirements to be

bundled together and communication simplified because a farmer can focus on one tool, the farm management plan, rather than a cacophony of requirements.

The template plan can be built from an industry framework, such as DairySAT, and tailored in each catchment to include the requirements of the relevant Regional Catchment Plan. Some level of standardisation would be required in how the industry framework and catchment plan were developed (stakeholder consultation) and aligned with the principles of the Standard. The plan can then be the basis for risk assessment (where the farmers are not certified but the factory may seek certification) or for a group certification program (where the farmers are certified). This process standardises industry performance through the supply chain, across catchments, industries and countries.

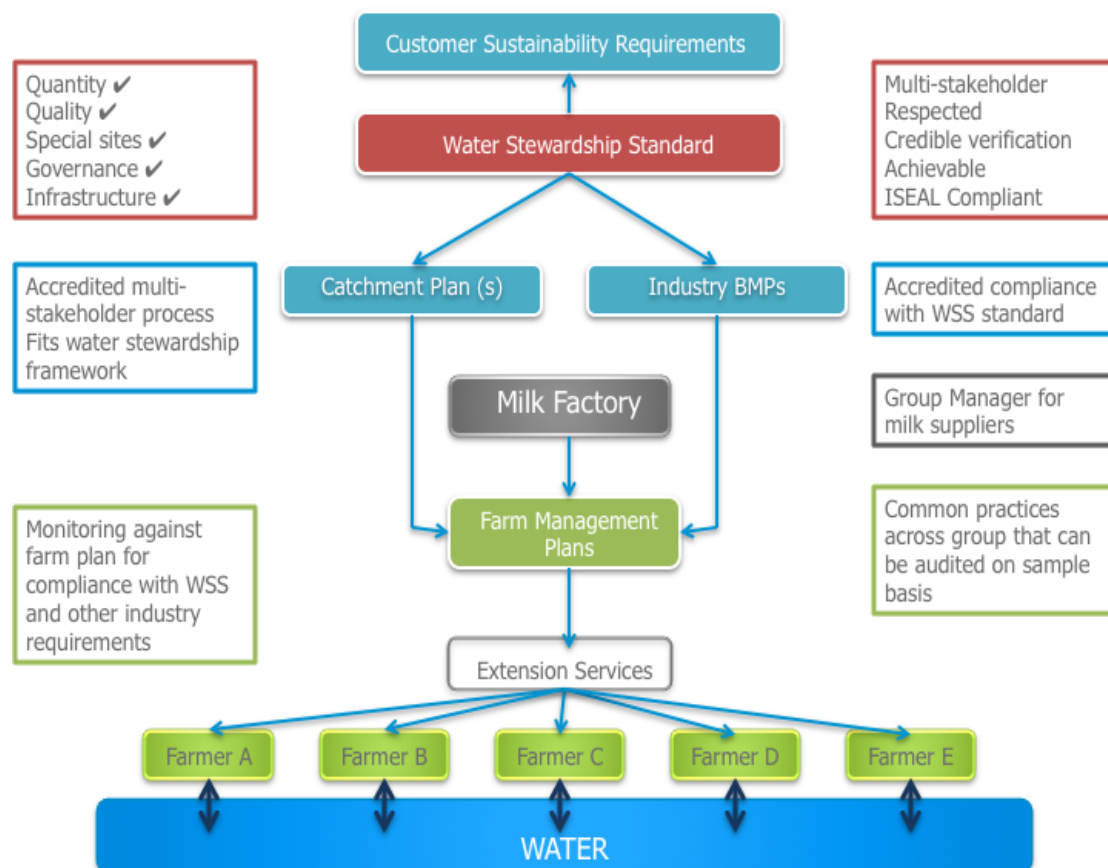


Figure 1

Observation:

In reviewing this model in the context of current customer sustainability expectations, it became apparent that conformity with the Standard could satisfy a broader set of goals than just water. An area of interest for the industry was the need to satisfy biodiversity goals. The Standard's requirements for 'special sites and values' could make an important contribution to the management of biodiversity. Good water stewardship also implies good stewardship of land and biodiversity.

Recommendations:

- Despite reservations, it is clear that the inclusion of indirect water use

provides an important mechanism for bringing small-scale producers and suppliers into the water stewardship system and can be achieved in a way that results in net overall benefit.

- Guidance should be provided on conforming catchment sustainability plans and industry frameworks that would simplify conformity assessment and achieve greater consistency.
- It is recommended that some guidance on stakeholder consultation accompany future drafts. This guidance needs to cover not only how and when to engage stakeholders but issues such as making information available to the public and public reporting on performance.

Conformity Assessment

Lloyd's Register Quality Assurance (LRQA) was engaged to assess the auditability of the Standard. In summary, the auditors found that an assessor would likely be able to reach a conclusion on all of the requirements, although in many instances there is ambiguity about assessing performance. This chiefly relates to the situation where the catchment management authority does not provide the catchment-focused goals, targets and monitoring required. Without further guidance on this issue, it is likely that different auditors will have inconsistent interpretations of the Standard when verifying performance. This would result in inconsistent certification decisions. The expertise and training of auditors is also an important consideration for consistent decisions.

Observation:

The trial found that the Standard was a viable conformity assessment tool and that the performance of an enterprise such as TMI could be usefully assessed using this tool and that it could provide an incentive to broader engagement on water related issues (governance, special sites and values). It also found areas for improvement with the Standard.

Recommendations:

- There is a need for additional guidance on compliance with particular performance requirements of the Standard.
- Consideration needs to be given to an appropriate accreditation process for auditors including levels of expertise to assess water related performance, training and audit procedure manuals.
- There is a need for the Standard to focus on matters where there is a direct and measureable relationship between the enterprise and observed outcomes in the Catchment.

Reference Group comments

The Reference Group provided important and valuable guidance to the project. While the project has taken longer than most parties would have liked, most have found the process worthwhile and beneficial.

The GBCMA concluded that the Standard could have considerable natural resource management (NRM) benefits for the region. Its participation was driven by the following considerations:

- Improved industry ownership of CMA programs and objectives through Standard conformance can result in alignment and acceleration of catchment programs and objectives.
- Conformance with the Standard demonstrates alignment with the Regional Catchment Strategy and provides confidence to potential investors in catchment management.
- Implementing the Standard can help develop potential links to other natural resource management (NRM) planning being undertaken in the catchment. For example carbon sequestration and biodiversity, as well as land and water management (salinity, water quality, environmental water).
- Achieving conformance with the Standard will drive the next evolution and uptake of on-farm water use efficiency (recognising the public benefits from this drive).
- Conformance with the Standard can lead to improved community governance and engagement in catchment management.
- Acknowledgement of the CMA's programs and objectives as part of Standard conformance will help position the CMA as a credible industry partner, both locally and nationally (e.g. with MDBA).
- Implementation of the Standard can help simplify/demystify catchment processes for other industries (e.g. farmers).
- The CMA can help industry partners use and implement the Standard.

Dairy Australia noted the pressure companies are facing to report on sustainability in the supply chain. Through participation in the trial it sought to gain a better understanding of the cost and compliance impacts of a standard at an early stage in its development.

The trial provided DA with an opportunity to assess the performance of existing tools such as the Dairy Self Assessment Tool (DairySAT) and how gaps could be addressed without increasing compliance costs. It found that the trial could inform the development of targets and action plans in the industry's sustainability framework and self-assessment tool.

Observation:

Both the CMA and DA found the field trial useful for understanding the opportunities and implications of working with a conformity assessment tool such as the Standard for pursuing their own operational and strategic goals.

Summary of Observations and Recommendations

Relevance	Observation
Trial Evaluation	Both the CMA and DA found the field trial useful for understanding the opportunities and implications of working with a conformity assessment tool such as the Standard for pursuing their own operational and strategic goals
Conformity assessment	The trial found; (1) the Standard was a viable conformity assessment tool, (2) performance of an enterprise such as TMI could be usefully assessed, (3) it could provide an incentive for broader engagement on water issues (governance, special sites and values) and, (4) areas for improvement with the Standard.
Customer sustainability goals	It became apparent that conformity with the Standard could satisfy a broader set of goals than just water such as biodiversity goals. Requirements for 'special sites and values' could make an important contribution to the management of biodiversity.
Indirect water	The main indirect water use for TMI was by its 280 dairy farmer suppliers for whom compliance would be a significant additional task. The compliance burden needs to be minimized and clear benefits demonstrated for water stewardship to be implemented.
Embedded water	Embedded water as proposed by the Standard is a new concept. The trial found that enterprises know the water content (approximate if not precise) of major inputs but not the breakdown of that water (green, blue etc.).
Water quality	The MDBA, CMA and water authorities can play a role by providing clear, concise, relevant and regular advice on best practices and performance in the sub-region.
Water quality	Growers and processors can play a positive role in ensuring the system works by participating in water governance opportunities either directly or through their community or industry association.
Water quality	Seasonal conditions can play a big part in quality performance of surface water flows (i.e. drought and flood will influence relative concentrations).
Recommendation	
Flow regime	There should be a stronger focus on outcomes that result from an appropriate flow regime rather than flow <i>per se</i> . This should emphasise interaction between water and the natural environment over time.
Flow regime	Flow regime should not be considered in isolation but interlinked with governance and special sites and values.
Groundwater	The Standard focuses on groundwater as a consumptive issue (resource) and needs to consider whether specific goals are required for dealing with salinity issues (groundwater as a threat).
Groundwater	Different geographic space (and sphere of influence) may be relevant to the causes, impacts and solutions to groundwater issues such as salinity.

Water quality	The analysis highlights the relationship between the Water Quality Principle and the Governance Principle. This should be further developed in future iterations of the Standard.
Water quality	The Standard should consider a longer term, say five year, view of quality measures that will overcome the peak and trough effects of seasonal conditions such as drought and flood.
Special sites and values	The Standard needs to encourage and reward close cooperation with catchment managers to achieve improvement in ecosystem health and cultural assets. This highlights to the need for close integration of this principle with the Governance Principle.
Special sites and values	Rewarding leaders and innovators (particularly in the protection and enhancement of special sites and values) could be an important addition to the Standard (e.g. LEED Innovation Points)
Infrastructure	The Standard should focus on infrastructure for the efficient use of water within an enterprise and participation in catchment governance to promote the provision of infrastructure for the Catchment that is adequate for the task, sound and efficient and well maintained (as described in the Infrastructure Principle).
Governance	The Standard needs to create a test for whether an enterprise is engaging with governance opportunities in a way that promotes good water stewardship outcomes (accepting this may not always be successful). Where opportunities do not exist a test is needed for whether the enterprise is contributing to their establishment.
Embedded water	The Standard needs to provide for phasing-in the concept of embedded water e.g.; (1) understand major water consuming inputs and engage suppliers, (2) introduce sophisticated analysis of embedded water use and include less water intensive inputs.
Indirect water	The inclusion of indirect water use provides an important mechanism for bringing small-scale producers and suppliers into the water stewardship system with net overall benefit.
Catchment plans and industry frameworks	Guidance should be provided on conforming catchment sustainability plans and industry frameworks that would simplify conformity assessment and achieve greater consistency.
Stakeholder consultation	Guidance on stakeholder consultation is needed, covering how and when to engage stakeholders, making information available to the public and public reporting on performance.
Conformity Assessment	There is a need for additional guidance on compliance with particular performance requirements of the Standard.
Conformity Assessment	Consideration needs to be given to an appropriate accreditation process for auditors including levels of expertise to assess water related performance, training and audit procedure manuals.
Conformity Assessment	There is a need for the Standard to focus on matters where there is a direct and measureable relationship between the enterprise and observed outcomes in the Catchment.

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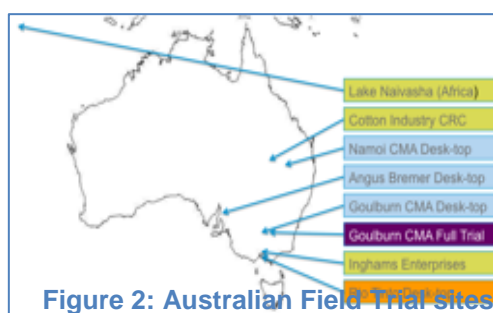
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Abbreviations

AWS	Alliance for Water Stewardship
BEMS	Bega Environmental Management Systems
BMP	Best Management Practice
CMA	Catchment Management Authority
CRC	Cooperative Research Centre
DA	Dairy Australia
DO	Dissolved Oxygen
DairySAT	Dairy Australia Self-Assessment Tool
EC	Electrical Conductivity
EPA	Environment Protection Authority
EREP	Environment and Resource Efficiency Plans
GBCMA	Goulburn Broken CMA
GDE	Groundwater Dependent Ecosystem
GMW	Goulburn Murray Water
GVW	Goulburn Valley Water
LRQA	Lloyds Register Quality Assurance
MDBA	Murray Darling Basin Authority
RCS	Regional Catchment Strategy
TMI	Tatura Milk Industries
TM	Tatura Milk
TN	Total Nitrogen
TP	Total Phosphorous
SES	Socio-ecological systems
SEPP	State Environmental Protection Policy
SIR	Shepparton Irrigation Region
SIRCIS	SIR Catchment Implementation Strategy
SSDP	Sub-surface Drainage Program
SWMP	Surface Water Management Program
VEWH	Victorian Environmental Water Holder
VHRS	Victorian River Health Strategy
WFP	Whole Farm Plans
WSA	Water Stewardship Australia

Background, scope and methodology

Water Stewardship Initiative Pty. Ltd. (predecessor of WSA Limited) in association with Cotton Communities CRC developed the world's first water stewardship standard in 2009 with support from the MDBA (MD1300). That standard was subsequently tested with three industry sectors (cotton, horticulture and poultry processing) on two continents (Australia and Africa). These trials found the standard could drive significant improvement in water management but that there were also a number of areas for improvement. The Australian Standard became the basis for an international standard development process in 2011 by the Alliance for Water Stewardship (AWS) with an international 'straw dog' standard being based substantially on the Australian work. That standard represented a further development of the original Australian work. A subsequent project supported by the MDBA (MD 1946) picked up that process and used the learning to develop a Draft 2 Australian Water Stewardship Standard (WSA-STD-001 V2) that could be the basis for a series of field trials in the Basin. Water Stewardship Australia (WSA) approached three CMAs within the Basin to develop cooperative proposals to field trial the Standard. Two early adopters were the Goulburn Broken CMA (Victoria) and Murray Darling Basin Natural Resources Management Board (South Australia).



WSA undertook three workshops with CMAs and subsequently a Desktop Field Trial with Tatura Milk Industries(TMI) and the Goulburn Broken CMA (GBCMA). Part of the desktop exercise was to scope a full field trial of the Standard. As a result, this project moves from a desktop trial to a comprehensive evaluation of the performance of the Standard 'in the field' working with staff from TMI, Dairy Australia (DA), the GBCMA and milk suppliers (dairy farmers). Work commenced on 31 May 2012.

Field trial scope

This Field Trial was conceived by WSA in discussion with DA, the MDBA, GBCMA and TMI, a wholly owned subsidiary of Bega Cheese Limited. TMI agreed to be the subject for the trial that was intended to test the application of the Draft 2 Australian Water Stewardship Standard to the dairy industry. The project was scheduled for June to August 2012 however the final report was not presented to the Reference Group until October. The overarching objectives for WSA field trials are:

- (1) To test the applicability of the Standard to a region, an industry or a set of water users in a particular catchment;
- (2) To ensure that the experience and situation of an industry, region or catchment are taken into account in the drafting of the WSA/AWS Water Stewardship Standard;

- (3) To engage stakeholders in the opportunity and potential of a water stewardship system, and;
- (4) To provide benefit/value to all participants.

Specific goals for this trial were:

- To demonstrate that a water stewardship system could add value for both the catchment manager in balancing competing demands and the dairy industry in dealing with its compliance costs and stakeholder relations;
- To see how the *Draft 2 Australian Water Stewardship Standard* (WSA-STD-001 V2) (the Standard) could perform in response to these needs and its usefulness as a conformity assessment tool; and
- For the project sponsor, the MDBA, to further investigate if a voluntary conformity assessment program such as water stewardship could drive uptake of Best Management Practices (BMPs) in the Basin.

The TMI milk factory is located at Tatura in the Shepparton Irrigation Region (SIR). The factory has operated since 1907 when it began as a butter factory. It produces 80,000 tonnes of dairy products annually using milk supplied by 280 dairy farms ranging in herd size from 40 to 1,200 cows. The factory is a major manufacturer of infant formula and private label cream cheese, exporting well in excess of 60 per cent of its production to international markets, mainly Asia. The factory has its own extension staff who works with suppliers on a range of quality and other standardisation issues including environmental systems. As part of Bega Cheese, TMI is looking to implement the Bega Environmental Management Systems (BEMS) with its suppliers. BEMS is broadly based on the Dairy Industry Self Assessment Tool (DairySAT). During the trial BEMS was being introduced on a voluntary basis.

DA as the author of the DairySAT tool and GBCMA as the author of the Regional Catchment Strategy (RCS) were parties to the trial. Both DairySAT and the GBCMA RCS became important parts of how it was envisaged a water stewardship system could be implemented in the Catchment.

For the purposes of this trial, the factory was treated as the unit seeking certification and the dairy farmers supplying the factory as indirect water use by TMI. This allowed a whole supply chain approach to be adopted and the farms to be treated as a group rather than individual enterprises. It also meant the trial could fit with existing structures where the factory engaged with its suppliers on a range of issues. While the factory is an important water user in the Catchment, dairy farms that supply the factory were, as a group, much more important in terms of catchment impact.

Methodology

The project was approached as a series of components to be tackled sequentially by the project team. These components are set out below.

- 1) Establish Stakeholder Reference Group³
 - a) Agree balance of stakeholder interests to be represented.

³Invited stakeholder reference group members: DA, TMI, dairy farmer representative, GBCMA, Fonterra, Murray Goulburn, Lion, Parmalat, Goulburn Murray Water (GMW).

- b) Identify potential reference group participants.
 - c) Prepare briefing on TOR, goals, objectives of the Standard and field trial.
 - d) Send invitations and set first meeting date.
- 2) Catchment Goals/WSA Framework
 - a) Review Section 4 of the Standard regarding long-term catchment level goals and develop framework based on five principles of the Standard.
 - b) Review relevant catchment level plans, strategies and documents.
 - c) Insert existing long-term catchment goals in framework, identify areas where goals are readily available, identify gaps.
 - d) Identify issues relevant to future development of the Standard and audit system.
- 3) Sub-catchment goals and measures
 - a) Review Section 5 of the Standard regarding sub-catchment goals and measures.
 - b) Define sub-catchment or sphere of influence for the operation (TMI and suppliers).
 - c) Translate long-term catchment goals (2) to sub-catchment and identify appropriate measures to assess performance in the sub-catchment.
 - d) Evaluate alignment between local catchment indicators and specifications in Section 5 of the Standard.
 - e) Review with relevant stakeholders.
 - f) Identify gaps and issues relevant to future development of the Standard and audit system.
- 4) Evaluate requirements in Section 6 of the Standard relating to indirect water use
 - a) List major indirect sources of water (in product from suppliers).
 - b) Identify risks in relation to water stewardship principles for indirect use (suppliers).
 - c) Identify areas where suppliers could contribute to catchment and sub-catchment goals (further development from (5) above).
 - d) Evaluate alignment between water stewardship and existing extension services with suppliers (BEMS).
 - e) Identify gaps and issues relevant to future development of the Standard and audit system.
- 5) Evaluate requirements in Section 9 of the Standard relating to catchment and sub-catchment indicators.
 - a) Identify measures from (2), (3) and (4) above (Sections 4, 5 and 6 of the WSA Standard) above relevant to the operation TMI and suppliers.
 - b) Evaluate alignment between the Standard and current company procedures and operations to identify potential impacts and gaps.
 - c) Identify issues relevant to future development of the Standard and audit system.
- 6) Gap analysis of operational/legal issues
 - a) Review sections 7 and 8 of the Standard.
 - b) Identify existing policies and procedures that address issues in sections seven and eight.
 - c) Undertake gap analysis and identify strategies and actions to address gaps.
 - d) Note issues for future development of the Standard and audit.
- 7) First meeting of Stakeholder Reference Group
 - a) Introductory meeting, WSA, Standard, Field Trial Goals.

- b) Discussion of high level catchment goals.
- 8) Roundtable with growers and sample site review
 - a) Verify proposals for managing indirect use with sample growers.
 - b) Note issues for future development of the Standard and audit.
 - c) Roundtable with cross section of growers on the Standard, its value and how it would be applied.
 - d) Review potential for group certification.
 - e) Note issues for future development of the Standard and audit.
 - 9) Audit Review workshop
 - a) Consolidate work to date for independent audit against the Standard.
 - b) Brief auditor on the Standard and its requirements.
 - c) Work with auditor on desktop audit of material.
 - d) Note issues for future development of audit system and further development of the Standard.
 - 10) Prepare report on gaps and Standard performance
 - a) Document process and outcomes.
 - b) Document gaps and issues for future consideration.
 - c) Report on whether the pilot achieved its objectives.
 - d) Review and discuss with participants.
 - 11) Stakeholder Reference Group report and workshop
 - a) Prepare a public report on field trial and an indicative three-year action plan to set out and justify plans to contribute to catchment-focused goals.
 - b) Conduct a half-day workshop with reference group to review the field trial; successes and shortcomings, and indicative three-year plan.
 - c) Sign-off on public report with participants.
 - d) Report on issues to be considered in future review of the Standard.
 - 12) Final Report and Next Steps
 - a) Finalise a public report and clearly identify next steps.

The Standard

The Draft 2 Australian Water Stewardship Standard (WSA-STD-001 V2) is attached as Appendix 1 to this report. The Standard contains a full explanation of impacts it is seeking to address and the ‘theory of change’ that underpins its five principles. The objectives of the Standard are to minimize negative impacts and support positive impacts and outcomes of water use and management in relation to:

- human health;
- social and cultural well-being;
- ecosystem health; and
- sustainable economic activity.

By achieving these objectives the Standard aims to provide value for private sector companies, public sector bodies and social and environmental stakeholders, justifying their investment in the development of the Standard and their support for its subsequent uptake and implementation.

The Standard contains five principles of Water Stewardship. The five principles provide the fundamental framework for the Standard.

Principle 1: Water flow regime

The enterprise is committed to maintaining or restoring a socially, environmentally and economically beneficial water flow regime in the catchments affected by its management.

Principle 2: Water quality

The enterprise is committed to maintaining or restoring publicly recognized water quality standards in the catchments affected by its management.

Principle 3: Protection or restoration of important water-related sites and values

The enterprise identifies, protects and/or restores important water-related sites and values that may be affected by its management.

Principle 4: Responsible participation in catchment governance

The enterprise participates actively and responsibly to achieve equitable and effective catchment governance.

Principle 5: Infrastructure maintenance

The enterprise participates actively and responsibly to maintain water infrastructure on its own sites and within catchments affected by its management.

Enterprises have both *direct* and *indirect* impacts from their own operations and those of their suppliers. For example, a milk factory will have a direct impact on water through its processing operations but it will also have major *indirect* impacts through farmers (and other suppliers) who provide the inputs for its production. In many cases an enterprise's indirect water use will have greater impacts than its own water use. The Standard aims to generate positive impacts not only through the enterprise's own use and management of water, but also through its engagement with suppliers in relation to its indirect water use.

The Standard is structured around a four-step process for implementing these water stewardship principles.

Step One: Recognition of long-term catchment-focussed goals

For an enterprise, the first step towards implementing the principles is to recognise and commit itself to supporting the achievement of generic, long-term, catchment-focused goals of water stewardship. In most cases the achievement of these goals will be beyond the control of an individual enterprise acting alone. However, the Standard is designed to take account of this. Nor does the Standard expect that the goals will be achieved in the short or medium term. What the goals are expected to do is to provide a clear, stable basis for identifying and evaluating actions that will be taken by the enterprise to achieve sustainable water use in the long term.

Step Two: Local specification of the long-term catchment-focused goals

The enterprise's second step is to translate these generic goals into more specific goals that are directly applicable in its own immediate catchment area. Preferably, these locally specified goals will be drawn directly from existing catchment management plans or work by the local CMA. However, where such plans do not exist, or do not provide sufficient detail, the enterprise would need to establish locally applicable catchment-focused goals itself, to meet the Standard's requirements.

Step Three: Defining the Enterprise-Specific Three-Year Action Plan

Once the enterprise's local catchment-focused goals have been established, it becomes possible for the enterprise to consider the most effective actions that it can

take to contribute to their achievement. The Standard is not prescriptive about what the most effective actions might be, it is up to the enterprise to decide this. The actions the enterprise identifies will be determined in part by consideration of its own 'sphere of influence'. The Standard specifies a rolling three-year time horizon for the actions the enterprise will take. The Plan provides a consistent, formal structure for identifying effective actions, and for justifying the enterprise's choice.

Step Four: Monitoring and Reporting on Progress on the Implementation of the Action Plan

The final step is for the enterprise to monitor and report on its actions, and their success in contributing to its long-term catchment-focused goals. The Standard does not require that the enterprise monitors catchment performance itself, but does require that such monitoring capacity is in place and that the enterprise has access to the data generated by the monitoring. This provides the basis for the enterprise to determine whether its own actions are effective in improving catchment-level performance, and ultimately for demonstrating that the water stewardship program as a whole is delivering the social, environmental and economic benefits that are expected of it.

This four-step approach is embedded in the Standard's structure, shown in figure 3.

1: Scope	Principle 1: Water flow regime	Principle 2: Water quality	Principle 3: Important water-related sites and values	Principle 4: Catchment governance	Principle 5: Water-related infrastructure
2: Terms & Definitions					
3: Water Stewardship Policy & Principles					
4: Long-Term Catchment-Related Goals					
5: Local Specification of Catchment-Related Goals					
6: Long-Term Goals for Indirect Water Use					
7: General Provisions for Implementation					
8: Legal Compliance					
9: Three-Year Enterprise Action Plan					
10: Monitoring Catchment-Related Performance					
11: Monitoring Indirect Water Use					
12: Data Management & Reporting					
13: Evaluation of Stewardship Programme Impacts					

Figure 3: General layout of Australian water stewardship standard

The catchment context

The Field Test site is located within the Shepparton Irrigation Region (SIR) of the Goulburn Broken Catchment in the Murray Darling Basin. Both the factory and about 280 dairy farmer milk suppliers to the factory are located in this Region.

The Murray Darling Basin

The Murray Darling Basin includes about one million square kilometres of land in five states and territories, including three quarters of the State of NSW and half of the State of Victoria. The Basin represents 14 per cent of the Australian landmass, about 65 per cent of Australia's irrigated land and generates 39 per cent of Australia's income from agricultural production. It collects an average of 530,618 GL of rainfall of which 94 per cent evaporates, two per cent drains to the ground and four per cent runs off into the basins streams and rivers. The Basin includes 23 rivers, important groundwater systems and storage capacity for about 35,000 GL. About 2 million people including 30 Aboriginal Nations live in the Basin.



Figure 4: The Murray Darling Basin
(Source: www.water.gov.au)

The Basin is under considerable ecological pressure as a result of intensive development of the region over the past 120 years. In 2010, the Australian Government Water for the Future project summed-up the challenge:

The ecosystems, which rely on the water flowing through the Basin's rivers and tributaries, are under considerable pressure, due to unsustainable extraction levels for irrigation and other extractive uses. This problem is likely to become worse as water availability declines, due to climate change. Without sufficient water, the Basin's ecosystems will continue to deteriorate, threatening many species and the viability of farming, non-rural production, cities and towns (DSEWPac 2010).

The Basin has a layered governance arrangement reflecting Australia's federal structure. The MDBA has overall responsibility for the Basin with powers vested by State and the Federal Government. Within the Basin there are a number of catchment governance organisations known as Catchment Management Authorities or Natural Resources Management Boards (operating under State powers). Overlaid on this structure are a range of local government authorities, water authorities, irrigation authorities and water distributors.

The major challenge for the MDBA over the past several years has been finding balance between competing uses and demands for water in the Basin. In November 2012, the Murray Darling Basin Plan was signed into law after a long period of negotiation. The Plan sets a Basin-wide Sustainable Diversion Limit (SDL) of 10,873GL for surface water, which means 2,750GL of water is to be recovered for the environment by 2019. So far, 1577GL has been recovered.

In the Goulburn Broken catchment, 334GL has already been recovered for the environment under the Basin Plan, primarily through buybacks from irrigators with more to come through water savings from on-farm works. This water is in addition to environmental entitlements gained since 2007 through State-based programs such as decommissioning Lake Mokoan as an irrigation storage in the Broken River Valley, the Shepparton Modernisation project and the Wimmera-Mallee Pipeline.

Allocations against the environmental entitlements are intended to help to improve the catchment's condition. The Plan allows for water to be released from dams for specific environmental purposes such as summer freshes, fish breeding, watering wetlands at a frequency and duration suitable for bird breeding, more regular inundation of the Goulburn River floodplain and a more natural seasonal flow regime in the Goulburn River, notwithstanding the constraints of irrigation demands.

The Basin Plan is a major national reform that will impact many of the issues water stewardship is seeking to address including (it is expected) the environmental issues in the Catchment identified in the 2007 Sustainable Rivers Audit (discussed below).

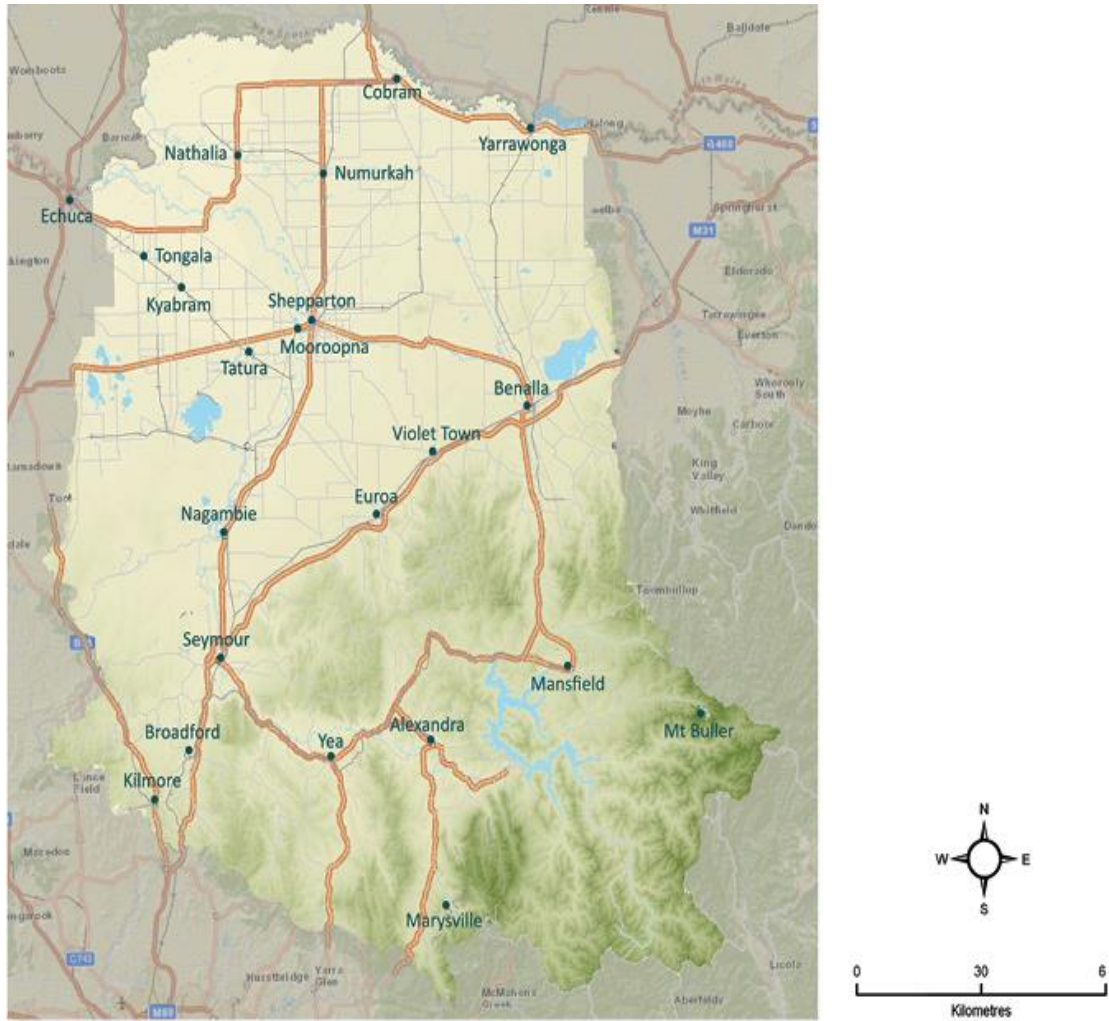
The Goulburn Broken Catchment

The Goulburn Broken Catchment includes the river valleys of the Goulburn and Broken rivers that join near Shepparton and continue to flow north into the Murray River. The Catchment covers 2.4 million hectares or 10.5 per cent of Victoria, including 1.4 million hectares of dryland agriculture, 270,000 hectares of irrigated agriculture and 800,000 hectares of public land. The mean annual flow of 3,300GL represents 11 per cent of the Basin's water from only two per cent of its land area. Rainfall varies from 1600 mm in the uplands to 400 mm in the north. The Goulburn has four major water storages including the State's largest dam, Eildon Weir (3 334 GL). The Catchment is also linked to neighbouring catchments including Melbourne through the north south pipeline, the Campaspe through the Waranga Basin storage and NSW through diversion at Yarrawonga. Surface water use represents up to 50 per cent of natural flows.



Figure 5: Goulburn and Broken catchments in the context of the Murray Darling Basin
 (Source: www.environment.gov.au)

Annual economic output of the Catchment (Gross Regional Product) was estimated at \$15.9 billion in 2012 with the bulk of this generated from natural resource based industries (livestock, dairy, horticulture). Agricultural production directly generates \$1.16 billion of output, employs 77 000 people and contributes about one quarter of the State's agricultural export earnings. The most productive area is the Shepparton Irrigation Region(SIR) in the north of the Catchment sometimes referred to as the 'food bowl' of Australia. More than 200,000 people live in the Catchment including 6,000 Indigenous Australians. An ageing farmer population has seen a shift from traditional farming to 'lifestyle farming' especially in the south of the Catchment.



Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, PC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2012

**Figure 6: Goulburn Broken Catchment
(Source: GBCMA)**

The Goulburn Broken Regional Catchment Strategy (2012 – 2018) classifies land into three geomorphic types; the Eastern Uplands, Western Uplands and the Northern Riverine Plain. The strategy plan further defines six socio-ecological systems (SESS) within the Catchment. These are illustrated in the Figure 7. They are defined by social and ecological characteristics such as landform, vegetation types, land uses, social structures and dynamics. The SES of interest to this study is the Agricultural Floodplains located on the Northern Riverine Plain.



Figure 7: Goulburn Broken Socio-ecological systems
(Source: GBCMA 2012)

Major natural resource issues in the Catchment are water quality, salinity, native vegetation decline, biodiversity and pest plants and animals (GBCMA, 2011). More than 70 per cent of native vegetation has been cleared and it is estimated that one in 10 plant and animal species are threatened (Abel et al 2003).

In its Sustainable Rivers Audit (MDBC, 2008) the Murray Darling Basin Commission (as it was then) rated the Goulburn River at the bottom of its league table for ecosystem health. The audit was conducted at the depth of the worst drought on record for the Catchment. At the time it described the river ecosystem as being in 'Very Poor Health'. Hydrological condition was described as 'Poor' with substantial changes to the flow regime (mean and median annual volumes and magnitudes and incidence of low-flow and high-flow events). Macroinvertebrate condition was described as 'Poor' with eighty-five per cent of families expected in the Valley recorded but family richness less than Reference Condition at all sites bar one. Fish condition was described as 'Extremely Poor' with only 56 per cent of predicted native fish collected and alien species accounting for 63 per cent of total biomass.

The Broken River is the smaller of the two rivers in the Catchment. It was described in the Sustainable Rivers Audit as being in Very Poor Health. Although rated the same as the Goulburn River for ecosystem health, the Broken River was in slightly better condition in terms of Fish (Very Poor) and Hydrology (Moderate to Good). Dismantling of Lake Mokoan, previously used for storage, would have improved the hydrology. Native fish were numerically dominant but fewer than half of the predicted native species were found and these were only one-third of the total biomass. Microinvertebrates Condition in the Broken Valley was Poor.

The Goulburn Broken CMA reviews catchment condition indicators on an annual basis and reports these in its Annual Report. Current conditions (2011) are set out below (GBCMA, 2011). The Catchment has benefited from a significant change of conditions since the Sustainable Rivers Audit was conducted, with the past two years being wet years after a prolonged drought. The Catchment has seen good rainfall and at least two major flood events.

Catchment component	Long-term strategy implementation progress	Catchment condition		
		1990	2011	Trend
Salinity: watertables and River Murray salinity				
Shepparton Irrigation Region salinity	On target	Poor	Good	●
River and wetland health and floodplain management				
Environmental flows	On target	Poor	Good	↑
Riparian and instream habitat and channel form	Below target	Poor	Satisfactory	↑
Water quality (nutrients) in rivers and streams	Exceeding target	Very poor	Satisfactory	↑
Flood protection	Exceeding target	Very poor	Poor	↑
Land and biodiversity				
Biodiversity	On target	Poor	Poor	●
Land health including dryland salinity	Below target	Poor	Satisfactory	↑
Invasive plants and animals	Below target	Poor	Poor	●
Collaborations and communities				
	On target	Poor	Satisfactory	↑

Table 1: Goulburn Broken Catchment Indicators (Source: GBCMA)

Shepparton Irrigation Region

The Shepparton Irrigation Region (SIR) is a well-defined region within the Catchment due to the predominance of irrigated agriculture. It sits on the Northern Riverine Plain geomorphic area and the Agricultural Floodplain SES. Approximately 317,000 of the SIR's 500,000 hectares (ha) are irrigated. The SIR makes an important contribution to the Victorian economy. Its major agricultural industries are dairying, and stone and pome fruit production (GBCMA, 2006). This production supports a large food processing industry.

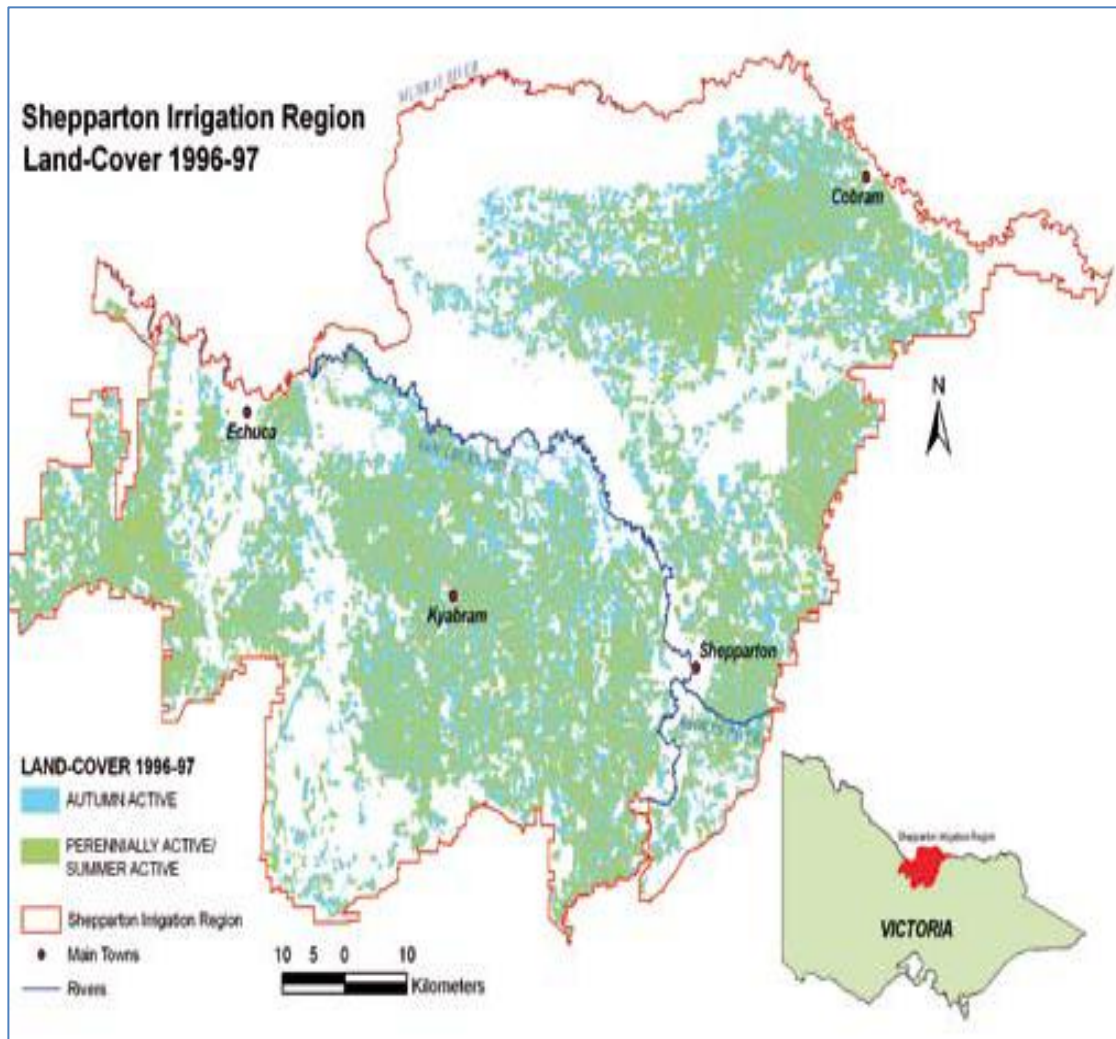


Figure 8 (Source: GBCMA)

SIR uses about 1,500 GL of water annually, depending on seasonal allocations. The majority of water is extracted from the Goulburn Broken and Murray systems (GBCMA 2010). It accounts for between 40 and 50 per cent of use of Victorian irrigation water (even during the recent drought which severely affected allocation volumes). SIR irrigators are responsive to changing expectations of irrigated agriculture and have adopted improved irrigation technologies and best management practices (BMPs) including Whole Farm Planning, automatic irrigation and reuse systems.

The SIR threats include: salinity, biodiversity loss, climate change, pest plants and pest animals, and issues of water quality and quantity decline. Activities that can influence these threats include: stock grazing, irrigation practices, management of irrigation infrastructure such as culverts, regulators, in-stream waterstorage management and cropping and pasture management. The Regional Catchment Strategy (GBCMA, 2012) has identified a series of issues and associated threats to the resilience of the agricultural floodplains. These are set out in the Table 2. Drivers of change are climate change, water policy and increased agricultural production. Potential impacts are: soil salinization and water logging, loss of ecosystem services, loss of threatened species and impacts on cultural heritage.

Context	Management measure	Possible specific action (examples)
<p>The greatest threat to ecological health of the abundant waterways and wetlands in the Agricultural Floodplains is management of upstream waterway systems, including regulation of flows. Timing and volume of flows are being adjusted as part of significant water policy reforms which aim to balance delivery of water (within thresholds) for:</p> <ul style="list-style-type: none"> biodiversity habitat (within and downstream of the Catchment, including wetlands outside of riparian areas) irrigation and associated processing industries domestic consumption. <p>Catchment partners, including community leaders, communicate Agricultural Floodplains SES priorities to Catchment and broader scale water policy bodies.</p> <p>Over the last 20 years, significant investment in initiatives such as water treatment plants, water reuse, and dairy shed effluent management has helped reduce nutrients to the Water Quality Strategy's target levels. The Catchment's water quality has improved, although isolated problems remain.</p>	Strategic priority: Influence regional water policy	
	Influence water policy development and implementation to secure water for improving natural asset condition and social and economic wellbeing	Continued community, DSE, Goulburn Broken CMA, DPI and water authority partnerships to provide balanced and informed input into policy development
	Create opportunities for community leaders to contribute to water policy	Involve industry body representatives in Farm Water Program design
	Strategic priority: Deliver water to waterways and wetlands	
	Plan, deliver and monitor environmental water delivery to improve the condition of priority waterways and wetlands	Meet Ramsar obligations for Barmah National Park including provision of natural flooding patterns
<p>The dry extreme of climate variability, which resulted in the 1997-2009 drought, meant that limited water was available to share. Resilience thresholds might have been crossed, with accelerated restructuring of dairying and horticultural enterprises (many individuals left the industries) and associated closures of major food processing factories. Past droughts continue to alter the identity and functioning of several townships.</p> <p>Water, energy and labour efficiency programs through water policy reform are helping the Agricultural Floodplains retain its food production function, although there is likely to be a threshold around the minimum area of irrigated land needed for a viable industry that retains processors locally. Water savings are being shared between the environment, irrigators and other users.</p> <p>Increased water efficiencies also help make soils and environmental features more resilient by reducing accessions to watertables: watertable depth and salinity level thresholds are critical objectives for management. The recent wet end of the climate variability range, which resulted in repeated extreme rainfall events, is leading to rapid recharge of watertables.</p> <p>Fire regime risks in public land such as Barmah are exacerbated when there are extended dry periods, which are part of climate variability, placing biodiversity habitat at risk.</p>	Strategic priority: Use water efficiently on farms	
	Modernise water delivery on irrigated land to provide ecological and productivity benefits	Continue to implement the Farm Water Program
	Strategic priority: Adapt to climate variability risks	
	Factor risks of climate variability and identify adaptation strategies in Goulburn Broken CMA and partner plans	Develop addendum for Biodiversity Strategy
	Factor risks to natural assets into public land fire management plans	Input into a strategic approach to planned burning in Barmah that considers ecological values
<p>Irrigated water delivery and management changes from modernisation drive the need for changes in drainage and shallow groundwater management.</p> <p>Land-use changes due to irrigation modernisation and the demand for increased farm production introduces threats to biodiversity, soils, wetlands, cultural heritage and groundwater, including off-site threats of water use. Farm production is constrained by several aspects of soil health related to salinity, such as soil sodicity.</p> <p>Also, farms outside the irrigation infrastructure modernisation footprint could become less viable and may undergo significant land-use change, providing a different suite of challenges.</p>	Strategic priority: Capture opportunities from land development	
	Deliver farm planning to integrate ecological and agricultural productivity benefits	Whole farm or total property management planning
	Promote land-use capability assessments and implementation, including use and management of water	Streamline new Irrigation Development Guidelines linked to whole farm planning and supported by planning schemes
	Strategic priority: Manage risks to agricultural production	
	Deliver surface and sub-surface drainage works across a modernised irrigation delivery system, including adaptive shallow groundwater management	Renewed investment in a drainage works program to support investment in irrigation infrastructure modernisation
<p>Streamside native vegetation widths and connections to terrestrial remnant vegetation are important considerations in maintaining the viability of public land reserves and threatened species populations. This in turn provides a range of ecosystem services to increased agricultural productions and lifestyles, and needs to be considered in relation to future climate variability.</p>	Strategic priority: Establish sustainable agricultural practices	
	Create awareness and acceptance of sustainable management practices to improve land and soil condition	Research costs and benefits of new options for farm production, such as energy
	Strategic priority: Increase biodiversity in agricultural land-use	
	Create awareness and acceptance of land management practices to enhance and protect terrestrial and aquatic habitat	Research to understand more about the productive benefits associated with habitat protection and enhancement, such as vegetation corridors and the retention of large, old trees
	Identify environmental stewardship opportunities for land managers	Community-led projects like the Superb Parrot Project
<p>Extreme climate variability has resulted in extreme drought, bushfires and floods over the last decade, impacting on the people in this SES long after the event.</p>	Work with landholders to protect and improve biodiversity on farms and build understanding of its contribution to sustainable and profitable farming	Education campaigns to target high value assets
	Strategic priority: Respond to and recover from climatic events	
	Plan and implement flood, fire and drought response and recovery	Delivery of support to affected communities

Table 2: Major issues influencing resilience of agricultural floodplains (Source: GBCMA 2012)

A series of programs have been developed in the SIR to implement the Catchment strategy (GBCMA, 2010). SIR Catchment Implementation Strategy (SIRCIS) goals include:

- Environment Program: To protect and enhance natural assets and their ecosystem processes and functions in a way that provides benefits for native biodiversity, social and economic aspects;
- Farm Program: To improve land management practices on private land within the SIR to protect and enhance the environment, to improve economic viability and to help rural communities make informed decisions;
- Sub-surface Drainage Program (SSDP): To work with community to provide innovative groundwater and salt management services which support sustainable agricultural practices and protect environmental assets across targeted areas of the Shepparton Irrigation Region;
- Surface Water Management Program (SWMP): By 2020, improve the health of natural resources and improve the productivity in the Shepparton Irrigation Region by providing an appropriate Surface Water Management service in areas where the total economic, social and environmental benefits exceed the cost; and
- Waterways Program: To protect and enhance the natural riverine features in the region, improve water quality and the social, economic and cultural values they provide.

Catchment goals



The old channel infrastructure



Automated Solar Irrigation Technology



Contemporary irrigation system

(images courtesy of Lisa Menhennett, TMI)

Section Four of the Standard requires that enterprises wishing to be recognised as water stewards identify and commit to achieving long-term *catchment-focused* goals corresponding to each of the five principles of water stewardship, both in the catchments in which their sites are located and in the catchments that are affected by their indirect water use. The intent is that if every enterprise in a catchment were to be certified as a water steward, the catchment would be considered to be under sustainable management in relation to water. Section Five of the Standard is intended to ensure that the generic goals identified in Section Four are appropriately adapted to the local catchment context and made locally applicable. In this report, Sections Four and Five of the Standard will be considered concurrently.

The Goulburn Broken is an extensively researched, highly regulated catchment. This was an important consideration not only in assessing the application of the Standard but also in generalising from this field trial to other situations. While the Catchment is not unique with regard to the amount of data and the extent to which it is regulated, it is in a sub-set of catchments worldwide in this regard.

Flow regime (surface water)

Section four sets out broad characteristics for an acceptable flow regime as follows:

The daily water flow at the lowest point of direct influence of the enterprise's sites in the catchment:

- i) Remains within +/- 20% of a locally applicable daily flow target for that point in the catchment under normal conditions;
- ii) Is adequate to prevent the extension of the duration and frequency of dry spells in low flow periods;
- iii) Maintains substantial water exchange between surface and ground water systems; and
- iv) Meets locally applicable targets for multi-year exceptional events (e.g. drought and/or flood conditions that would be expected to be achieved one or more times within a twenty-year period) over a twenty-year period.

However, consideration of flow regime in the Goulburn Broken Catchment is complicated by the range of natural flow rates between seasons and between years (drought, flood), the range of flow targets that exist for the river (Goulburn), the considerably altered flow and the interaction of legislative requirements and the allocation processes. The river has what amounts to a reversed flow regime (particularly in the reach between Eildon and Goulburn Weir). Under natural conditions it would have strong flows in winter and low flows in summer. In order to meet irrigation demand, water is stored in winter and released in summer thereby reducing overbank flooding in winter and creating strong flows in summer. It is clear that with up to 50 per cent of natural flow used for consumptive purposes, draw on the river is well beyond that envisaged in developing early drafts of the Standard (+/- 20% variation on natural flow). In order to be relevant to Australian conditions and highly developed Catchments the Standard will need to consider an alternative approach based on outcomes and governance participation.

Planning, entitlement and allocation of water in the State of Victoria is determined by the *Water Act (1989)*. The Act specifies requirements for the creation of Sustainable Water Strategies, bulk entitlements, groundwater and streamflow management plans. The framework gives priority to resource security and is built on the principle of recognising existing rights and entitlements (NWC, 2011). Given water from the river is 'fully allocated' it is unlikely that the action of any one enterprise would impact the overall flow regime. As one participant observed: "If I reduce my take from the flow it will just mean more water for someone else and have no impact on other demands for water (such as the environment)".

The Standard in Section Five anticipates that in many catchments some form of regulatory mechanism and allocation plan will determine flow regime. However it requires that these plans meet certain criteria for determining local flow regime.

5.1.1 The targets drawn from a water sharing plan must be:

- i) Transparently developed to maintain the values and objective of all key stakeholders (environmental, economic and social) through the water sharing plan process;
- ii) Scientifically justified;
- iii) Consider ground and surface water interactions; and
- iv) Take account of the predicted impact of climate change on the expected natural, un-depleted flow at the point of measurement.
- v) Maintain all elements of the scientifically determined flow regime

5.1.2 The targets where there is not a water sharing plan must:

- i) Remain within +/- 20% of a locally applicable daily flow target for that point in the catchment under normal conditions;

- ii) Be adequate to prevent the extension of the duration and frequency of dry spells in low flow periods;
- iii) Maintain substantial water exchange between surface and ground water systems; and
- iv) Meet locally applicable targets for multi-year exceptional events (e.g. drought and/or flood conditions that would be expected to be achieved one or more times within a twenty-year period) over a twenty-year period.

In addition to Sustainable Water Strategies developed under the Water Act, River Health Strategies are developed under the *Catchment and Land Protection Act (1994)*. These establish priorities for protection and restoration of river systems and are administered by Catchment Management Authorities (CMAs) guided by an overarching Victorian River Health Strategy (VHRS). The VHRS is currently being updated into a renamed Victorian Waterways Management Strategy. However, as the National Water Commission observed: “There is no link between actions to protect environmental assets identified in Regional River Health Strategies and the Sustainable Water Strategies required under the Water Act” (NWC, 2011).

Environmental entitlements are issued on regulated systems and hold similar characteristics to consumptive bulk entitlements (rights to use and supply water). The Office of the Victorian Environmental Water Holder manages these entitlements as a mechanism for securing water for environmental purposes. The Commonwealth Environmental Water Holder similarly manages environmental entitlements obtained under the Murray Darling Basin Plan, and liaises with State environmental water managers and agencies on how best to use the available Commonwealth environmental water allocations.

The Goulburn River Seasonal Watering Plan 2011-2012, developed by the GBCMA on behalf of the Victorian Environmental Water Holder, contains comprehensive information on a target flow regime for the lower Goulburn that reflects the range of seasonal issues and considerations (GBCMA, 2011). Conditions leading into 2011-12 involved several years of extended drought with low river flows followed by extremely wet conditions in 2010-11 where all environmental flow objectives were met by natural catchment runoff. The wet started the ecological recovery of the river. The 2011-12 proposal aimed to continue the ecological recovery, particularly focused on winter/spring flows that were absent during the drought years.

Priorities for the 2011-2012 years from the plan are shown in Table 3 and the full range of scenario planning considerations are contained in Appendix 2. Priorities include providing increased minimum flows up to 830 ML/day at Murchison and a good spring fresh to 5,600 ML/day at Murchison (and desirably another winter/spring fresh). Improved summer/autumn minimum flows of 940 ML/day at McCoy’s Bridge and one or two freshes to 5,600 ML/day using inter valley transfers or environmental entitlements. As overbank flows occurred in 2010/11 they were not required in 2011-12. The report also noted that, “Given risks associated with delivery of overbank flows, they are not to be delivered in the immediate future in any case”.

Priority	Flow component	Reach
1	2011 winter/spring baseflow at 500/540 ML/day	Downstream of Goulburn Weir
2	2011 spring fresh of 5,600 ML/day (or as high as possible)	Downstream of Goulburn Weir
3	2012 autumn/winter base flow of 540 ML/day	Downstream of Goulburn Weir
4	2011 winter/spring baseflow at 830/940 ML/day	Downstream of Goulburn Weir
5	Summer baseflow at 830/940 ML/day	Downstream of Goulburn Weir
6	1 or 2 summer freshes at 5,600 ML/day	Downstream of Goulburn Weir
7	2012 winter/spring baseflow at 830/940 ML/day	Downstream of Goulburn Weir
8	2011 winter fresh of 5,600 ML/day	Downstream of Goulburn Weir

Note - Flow components shaded in green are definite high priorities. Delivery of components shaded in blue will depend on the seasonally adaptive allocation process

Table 3: Summary of priority environmental flow requirements

The complexity of the range of targets is increased when consideration is given to the interactions between agencies and legal requirements governing the flow of water in the Catchment. Hence, the flow targets above represent a proposal by the GBCMA and VEWB to other Commonwealth and State agencies that determine the total release of water and the timing of such releases. For example Goulburn-Murray Water manages storages in the Catchment and releases water based on the allocation framework established under the *Water Act* for the State as a whole (as well as operational purposes when, for example, storages are full). The Victorian framework needs to consider proposals under the Murray Darling Basin Plan and the Commonwealth *Water Act (2007)*. Furthermore, while the Seasonal Plan represents bulk requirements, “as the season unfolds the design of specific flow regimes to optimise outcomes will be required” (GBCMA, 2011).

The Regional Catchment Strategy (RCS) attempts to bring together the range of considerations and obligations to different agencies into a coherent plan (GBCMA, 2012). The RCS also deals with issues such as the longer-term impact of climate change. But the RCS does not set flow regime targets per se. Water targets are expressed in terms of outcomes (see Appendix 3 for full table). For example:

- 350 km of river maintained in excellent condition;
- Ecological flow objectives met in high value reaches;
- Riparian condition protected or enhanced along 550 km of river;
- In-stream habitat enhanced or reinstated along 140 km of river; and
- Provide ecosystems with natural flooding patterns where appropriate.

Key strategies and management actions to deliver on these targets are expressed in

terms of (see Appendix 4 for full table):

- Influence water policy development and implementation to secure water for improving natural resource condition without affecting social or economic well-being;
- Plan, deliver and monitor environmental water delivery to improve the condition of priority waterways and wetlands; and
- Prioritise protection of waterways and wetlands within the modernized irrigation delivery system.

As will be discussed later, communicating these measures in terms of how an individual enterprise or farm can contribute to an ecologically sustainable flow regime will not be based on a predetermined target number. It will be through a series of actions that build toward an outcome. It will also be based on an integrated approach where flow regime, water quality, special sites and governance participation are seen as an integrated package, not isolated elements of a compliance regime. So participation in catchment governance and beyond (State level governance) will be as important to achieving a catchment flow regime as the actions an individual enterprise in the Catchment may take. This would assist in addressing NWC concerns that there is no clear trade-off process evident to set levels of extraction in planning instruments (NWC, 2011).

Flow regime (groundwater)

Groundwater requirements are only set out in Section Four in general terms:

The level of groundwater is maintained in accordance with an applicable groundwater management plan that identifies Groundwater Dependent Ecosystems (GDEs) and defines sustainable extraction limits; and

The level of groundwater at the lowest point of direct influence of the enterprise's sites does not fall below 80% of the estimated natural (unregulated and un-depleted) level for that point in the Catchment for any weekly measurement.

Whereas the Standard envisaged a focus on maintaining groundwater stores (80 per cent of estimated un-depleted levels), the focus in the Goulburn Broken is on ensuring groundwater levels do not rise too close to the surface. Salinity is the major groundwater concern in the Catchment particularly in the agricultural floodplain SES. Managing high water tables in an area of irrigated agriculture is an ongoing issue with potential to impact ecosystems and agricultural production. Threats include:

- Repeated extreme rainfall events leading to rapid recharge of water tables; and
- On-farm and sub-catchment surface water management practices.

Goulburn-Murray Water is currently modernising the region's irrigation infrastructure under a \$2 billion program previously known as the Northern Victorian Irrigation Renewal Project or NVIRP, and now renamed GMW Connections). This will assist more efficient use of water particularly when combined with a requirement for farmers to develop whole farms plans and improve efficiency in water use. Catchment wide management actions to deal with salinity have relatively clear targets. Specific goals include:

- Groundwater does not rise above 2 metres below the surface;
- Improved surface water drainage;
- Consistently pumping water with appropriate re-use;
- Keeping increases in salinity in the Murray River at Morgan below 8.9 EC;
- Ensuring no net increase in stream salinity in the Goulburn upstream of Goulburn Weir; and
- Protection of foothills and river valleys from salinisation.

Issues relating to in-stream salinity will be dealt with below in the context of water quality.

In terms of surface water to groundwater interaction, the NWC in its assessment noted that the locally applicable Sustainable Water Strategy stated there were not strongly connected areas in the Catchment. In the context of salinity control, it said connection was identified in the SIR between the shallow aquifer and surface water. It said: “Other planning instruments do not deal with connectivity”(NWC, 2011).

Water quality

Section Four of the Standard creates a general requirement that the enterprise not detrimentally affect water quality for downstream users:

Water quality at the lowest point of direct influence of the enterprise's sites does not fall below locally applicable minimum quality thresholds at any time; and

The enterprise discharges water to receiving environments that does not detrimentally affect the water quality of those receiving environments and their associated water dependent values.

Section Five introduces a requirement for enterprises to establish locally specific targets for water quality. In doing so it recognises that in most cases, these will be determined by a local authority although it specifies minimum requirements for the targets established.

The enterprise has established specific locally applicable minimum water quality thresholds applicable to the surface water (i.e. the receiving water body) at the lowest point of direct influence of the enterprise for key physical, chemical and/or biological aspects of water quality of importance in the catchment.

5.2.2 The targets:

- i) are scientifically justified;
- ii) include thresholds for the quality aspects that are of most importance to stakeholders within the catchment; and
- ii) are compatible with any locally applicable water quality regulations.

Catchment threats to water quality include increased salinity, increased nutrients (phosphorus and nitrogen), sediments and turbidity, toxicants such as heavy metals and pesticides, bacterial contamination, decreased dissolved oxygen, altered acidity (pH) and altered water temperature. Most of these threats are included in the State Environment Protection Policy (SEPP) (Waters of Victoria) and (Groundwaters of Victoria). These are regulations established under the *Environment Protection Act*

1970 and administered by the Environment Protection Authority (EPA). One goal of the SEPP is to set out the “objectives and indicators which describe the environmental quality required to protect beneficial uses” (EPA, 2003). Salinity targets are set in the context of the Water Act (Cth). The GBCMA reports annually to the MDBA against targets and is independently audited for compliance by an Independent Audit Group.

The SEPP sets out targets in three categories; water quality, biological and toxicants. For water quality the major thresholds are set out below.

Indicator		Unit
Total Phosphorus	75 th percentile	≤45µg/L
Total Nitrogen	75 th percentile	≤900 µg/L
Dissolved Oxygen	25 th percentile	≥85 % saturation
	Maximum	110 % saturation
Turbidity	75 th percentile	≤30 NTU
Electrical Conductivity	75 th percentile	≤500 EC
pH	25 th percentile	≥6.4 pH units
	75 th percentile	≤7.7 pH units

Table 4: SEPP Water Quality Targets Goulburn and Broken Lowlands

Compliance with SEPP requirements is somewhat loose with the Victorian River Health Strategy (2002-2009) requiring that only 60 per cent of lowland sites meet SEPP quality requirements. The last EPA Policy Impact Assessment on SEPP was published almost ten years ago. In its latest Annual Report, the EPA noted that: “Most Victorian catchments failed to meet many of the State Environment Protection Policy (SEPP) water quality and biological objectives.”(EPA, 2012). The EPA also singled out dairy farmers for special mention in relation to impacts of agriculture on Victorian waterways (although it is more likely that this related to the less regulated farms in southern Victoria than in the SIR). Nevertheless, any audit would need to pay close attention to water quality performance for this industry.

The 2005 River Health Strategy set fairly general targets for the Catchment. The 2012 Regional Catchment Strategy sets more specific targets:

- Keep increases to salinity levels in the River Murray at Morgan at or below 8.9 EC; and
- It reinforces a 1996 target to reduce phosphorus loads by 65 per cent by 2016.

The salinity target is derived from Clause 7 of Schedule B of Schedule 1 of the Murray Darling Basin Agreement (established under the Water Act (Cth)). The target is to be below 800 EC for 95 per cent of the time. Schedule B also specifies processes for assessment, review and amendment of targets and implementation of a joint program of joint works and measures to maintain water quality (salinity). MDBA regularly undertakes and publishes audits of performance of implementation of Schedule B. In the past 12 months salinity levels at Morgan have ranged from more than 400 EC to below 200 EC making an increase of 8.9 somewhat difficult to position in this context. Morgan is some distance downstream and a range of catchments as well as the Goulburn Broken would influence salinity levels at that site. Measuring stations are available closer to the Catchment at, for instance, McCoy Bridge (see below), Broken Creek and drains discharging into the Murray

River. There is a considerable amount of accessible data that can be used for tracking.

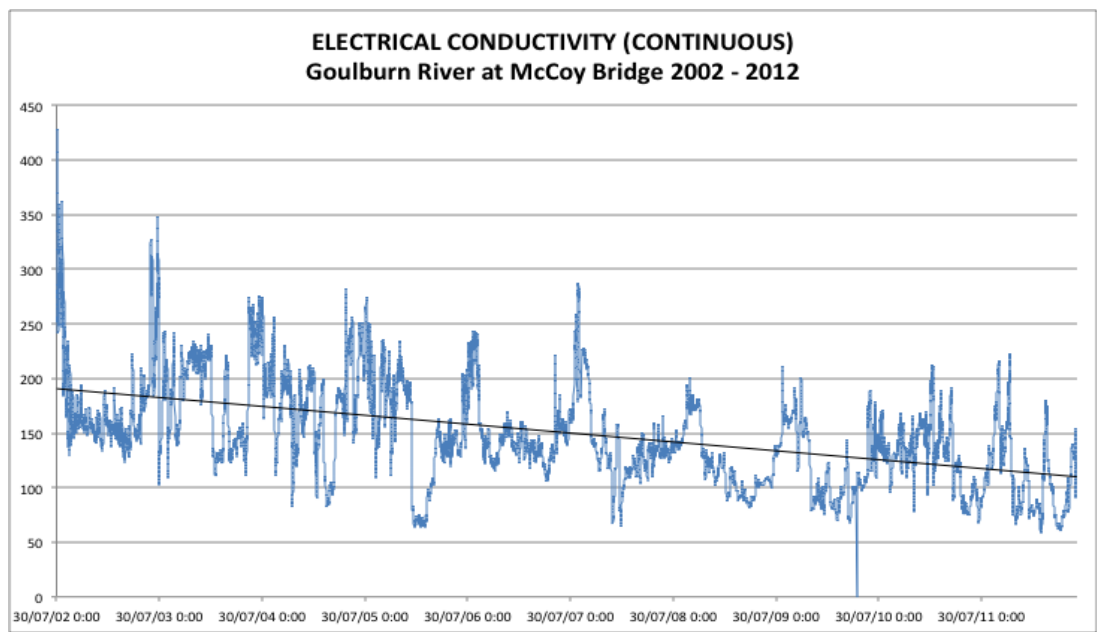


Figure 9

For interpreting the requirements of the Standard, salinity upstream and downstream of the sub-catchment can be tracked, although again, this variation could be due to a range of factors other than irrigated dairy (e.g. dryland farming).

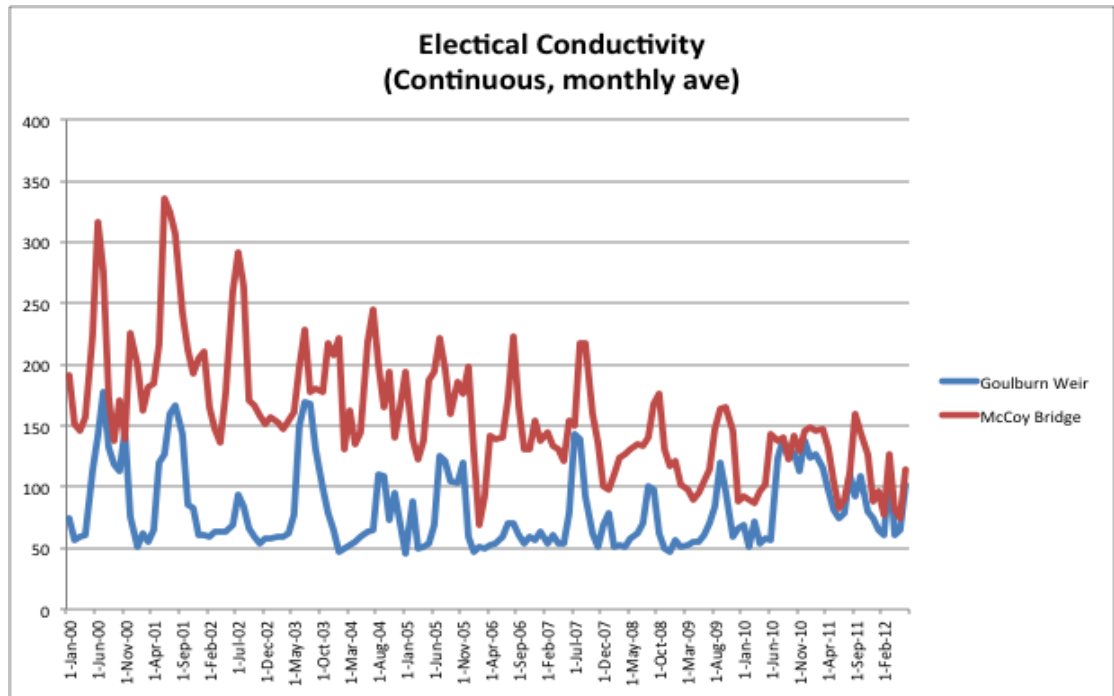


Figure 10

For total phosphorus the trend was until last year going in the right direction in relation to the target of a 65 per cent reduction in phosphorus load. This also shows the extent to which water quality issues can be influenced by seasonal conditions such as drought and flood with a strong downward trend in total phosphorous during

drought and strong upward trend during flood. This highlights the need to take a longer term, say five year, view of such information.

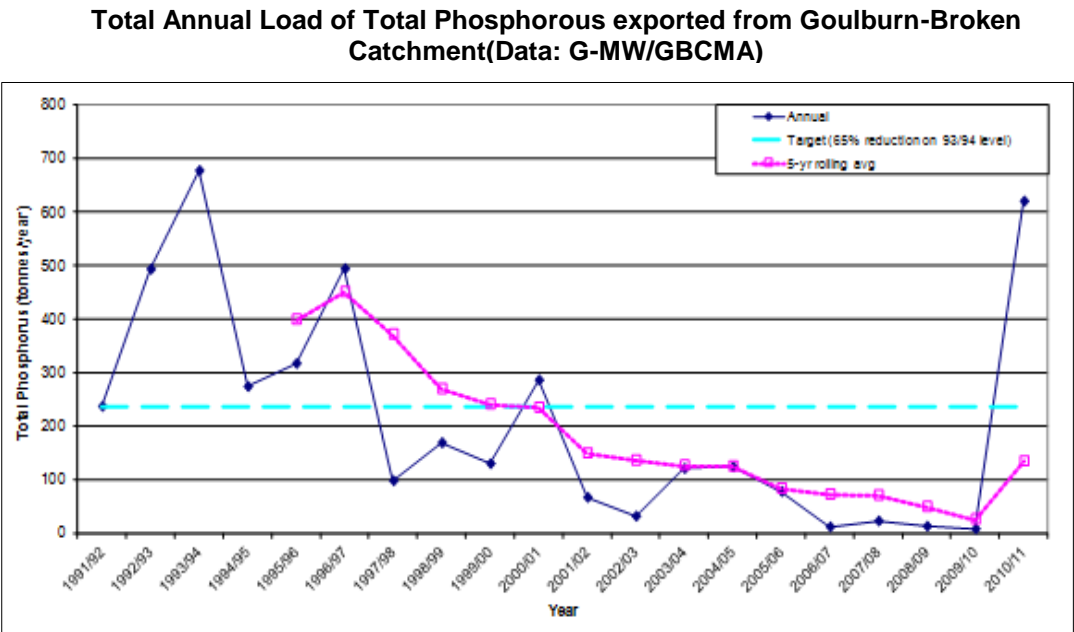


Figure 10.1

Total Annual Load of Total Nitrogen Exported from Goulburn-Broken Catchment (Data: G-MW/GBCMA)

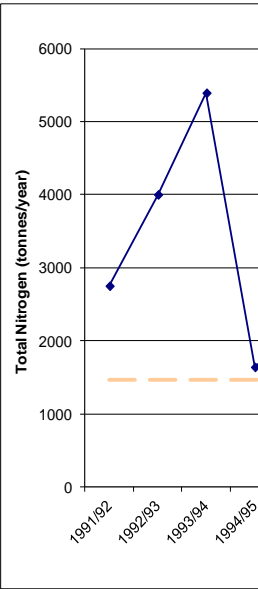


Figure 11.2

Estimated Annual Phosphorous Loads from all Irrigation Drains in the Goulburn-Broken Catchment(Data: G-MW/GBCMA)

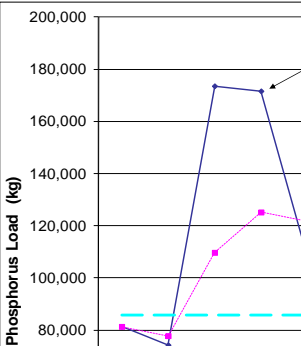


Figure 11.3

Estimated Annual Nitrogen Loads from all Irrigation Drains in the Goulburn-Broken Catchment (Data G-MW/GBCMA)

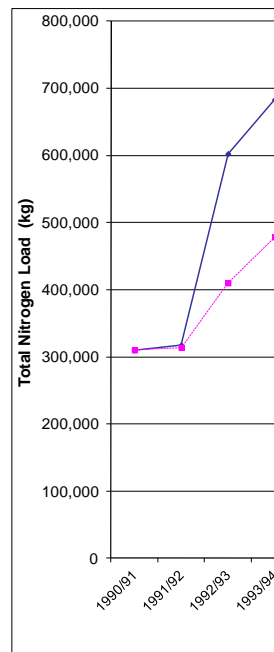


Figure 11.4

Nitrogen load (above) also varies with seasonal conditions and trended down during the drought, only to jump back up with the recent floods. For dissolved oxygen, the time series at McCoy Bridge was interrupted during the drought when this measure was discontinued. This raises concern about consistent collection of data (as well as consistent use of measures e.g. dissolved oxygen mg/L and percentage saturation).

For turbidity, levels recorded at McCoy Bridge mostly meet levels set by the EPA in the SEPP. At the time of writing this report, data on pH at McCoy Bridge was not available.

There is a wide range of measures available at a station such as McCoy's Bridge dealing with water quality and there are 364 active surface water-measuring sites within the Goulburn Broken Catchment. Not all will necessarily have the same range of measures. For a full audit it would be a matter of establishing the most

appropriate station and relevant measures from those available having consideration for the over-riding SEPP requirements (even though, in a number of cases what is measured is not identical to the measure listed in SEPP).

Review of the Standard's requirements for water quality within a catchment shows that for the Goulburn Broken adequate measurement tools exist (in fact very comprehensive measurement at Vic-waterdata). While targets exist they are somewhat loose in an area where there is scope for tighter requirements. It would be possible to set firmer catchment goals even if these did require a band of acceptable outcomes that reflected seasonal conditions over a period of say five years. It should also be noted that while the SEPP targets exist in law they are not enforced and not necessarily aligned with what is currently monitored.

Important sites and values

The goal of the Standard in relation to important sites and values, as expressed in Section Four, is that:

Important water-related sites and values that may be affected by the enterprise's water use and management are in a good state, and are protected in the long term.

Section Four requires:

The enterprise commits to working with the applicable authority to establish a management plan for the important water-related sites and values and working constructively to achieve the outcomes of the plan and it's associated goals.

In Section Five the intention is to provide a local interpretation of the definition of 'important water-related sites and values' describing the kinds of sites and values that are considered to be important in the local context. Specifically:

5.3.1 There is locally-applicable guidance on the identification of water-related sites and values that are considered to be important in the catchment(s) in which the enterprise operates;

5.3.2 There is an up-to-date and publicly accessible listing of all specific examples of important water-related sites and values that may be affected by the enterprise's own water use and management activities, prepared in consultation with local stakeholders;

5.3.3 The enterprise will prepare a management plan for the important water-related sites and values that may be affected by the enterprise's own water use and management activities with details of how these effects will be managed to prevent decline in the condition of these assets and

5.3.4 There is an up-to-date and publicly accessible register describing the principle management goals for each of the identified water-related sites and values.

For the Goulburn Broken, the Regional River Health Strategy (GBCMA, 2005) identified High Priority Reaches within the Catchment that were:

- Of greatest value to the community; and
- Ecologically healthy.

Some 44 reaches were identified through this process. Risk-based analysis was applied to understand threats and determine management actions to address those threats. The strategy also identified 13 reaches that could be improved to an ecologically healthy condition. Programs for enhancement and maintenance of High Priority Reaches were developed and costed for implementation over a 10-year period (2005 – 2015) with a mid-term review scheduled for 2010. Reaches identified are set out in the Tables below.

Values identified in the High Priority Reaches include: Ramsar wetlands, wetlands of national significance, biodiversity values (including fish), cultural heritage and economic value. A quite detailed plan for managing these values in the context of risks identified is set out in the Regional River Health Strategy along with the responsible agencies and estimated costs for implementing the plan as well as a monitoring, evaluating and reporting regime.

A formal mid-term review of the Strategy was not undertaken in 2010 in part due to changes in policy and in part due to prolonged drought both of which impacted the river management regime. However an addendum to the 2005 strategy was published (GBCMA, 2010) and this outlined general actions taken in the Catchment over the period to improve river health. It out some overarching objectives that included:

- 350 km of river maintained in excellent or good condition;
- Ecological flow objectives met in High Value Reaches;
- Nutrient loads reduced or improved;
- Riparian condition protected or enhanced along 550 km of river; and
- In-stream habitat enhanced or reinstated along 140 km of river.

These objectives have since been included in the 2012 to 2018 Regional Catchment Strategy (GBCMA, 2012). This strategy includes specific consideration of wetlands (including discussion of important wetlands in the Agricultural Plains SES).

River	Reach	High value asset
Goulburn Basin		
Goulburn River	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	Heritage River (1-14); Association with wetlands of national significance (1-8); High overall environmental significance (1, 3, 4, 7, 8) High overall social significance (5, 6, 8, 9) High overall economic significance (14) Murray cod (1-8); Silver perch (1-8); Macquarie perch (15); Ecologically healthy river (15); Barred galaxias (16); Spotted tree frog (16); Alpine bent (16).
Seven Creeks	19	Trout cod; Macquarie perch; Environmental Site of Significance.
Seven Creeks	20	Macquarie Perch
Gobarup Creek	33	Association with wetlands of national significance.
Hughes Creek	37	Macquarie perch; Murray cod.
King Parrot Creek	51	Macquarie perch.
Yea River	55	Macquarie perch.
Acheron River	62	Environmental Site of Significance.
Taggerty River	64	Ecologically Healthy River; Representative River; High overall environmental significance; Barred galaxias.
Rubicon River	66	Barred galaxias
Big River	67	Heritage River; Ecologically Healthy River; Spotted tree frog.
Big River	68	Heritage River; Ecologically Healthy River; Representative River.
Howqua River	69	Heritage River; High overall economic significance.
Howqua River	70	Heritage River
Delatite River	71	Murray cod.
Delatite River	72	High overall economic significance.
Broken Basin		
Broken River	1, 2, 3, 4, 5	Association with wetlands of national significance (1, 2); Murray cod; Macquarie perch (3, 4, 5) Silver perch (1).
Holland Creek	13	Macquarie perch.
Ryans Creek	17	Ecologically Healthy River; Representative River.
Broken Creek	21, 22, 23, 24, 25, 26	Association with Ramsar wetlands (21); Murray cod (21-23); Association with wetlands of national significance (22-26).

Table 5: Highest Priority Reaches identified in the Goulburn Broken

River	Reaches	High value asset
Goulburn Basin		
Goulburn River	16	Near “Ecologically Healthy” status
Bylands Creek	36	
Dry Creek	48	
Yea River	54-57	
Murrindindi River	59	
Acheron River	63	
Rubicon River	65	
Howqua River	69, 70	
Broken Basin		
Holland Creek	15	Near “Ecologically Healthy” status

Table 6: High Priority Reaches - near healthy condition

River	High value asset
River Murray	Internationally recognised for its significant red gum forests and wetlands; Interacts with two RAMSAR Wetlands; Popular with recreational users who enjoy its natural beauty, camping, fishing and boating opportunities; Murray cod and Trout cod.

Table 7: Priority for the River Murray

The Regional Catchment Strategy acknowledges massive change in the hydrological cycle in the SIR since European settlement due to clearing of vegetation and introduction of irrigation. As a result about 9 per cent of the Agricultural Floodplains SES is adversely affected by shallow saline water tables. The Strategy says the biggest threat to waterways that are already highly modified from their original state is regulation and the associated timing and volume of flow in irrigation channels. It says most waterways are in poor condition.

Priority waterways are listed as:

- Goulburn River;
- Seven Creek;
- Gobarup Creek;
- Broken River; and
- Broken Creek.

Priority wetlands are listed as:

- Barmah Forest (Ramsar);
- Kanyapella Basin;
- Muckatah Depression;
- Gaynor Swamp;
- Wanalta Wetland Complex;
- Reedy Swamp;
- Kinnairds Swamp;
- Black Swamp; and
- Carlands Swamp.

Important features of each wetland are described in the Strategy with a comment that current wetland condition is generally moderate to good although wetlands on public land are in better condition than wetlands on private land. The latter are described as being in a generally poor state. The biggest threats to wetlands are listed as river regulation, drainage and land forming.

Increasing biodiversity in agricultural land-use and on-farm efficient water use are identified in the Strategy as two priorities (amongst others) for the Agricultural floodplains of the SIR. These priorities need to address habitat patch sizes (three hectares), minimum 30 metres of native vegetation from the top of waterways bank and, linking remnant habitats.

In relation to these issues, there is considerable scope for improvement through farm planning and other initiatives. A survey of natural resource management on dairy farms carried out for Dairy Australia in 2012 (Down to Earth Research, 2012) showed that almost half of dairy farms have areas fenced for conservation (47 per cent) and about one third (34 per cent) have all waterways fenced (up from 18 per cent in 2000). Additionally, 73 per cent have undertaken at least some fencing. These

survey results would indicate that there is both an appetite for addressing these issues among dairy farmers and considerable scope for further work. A water stewardship standard needs to both recognize and reward farmers for these actions.

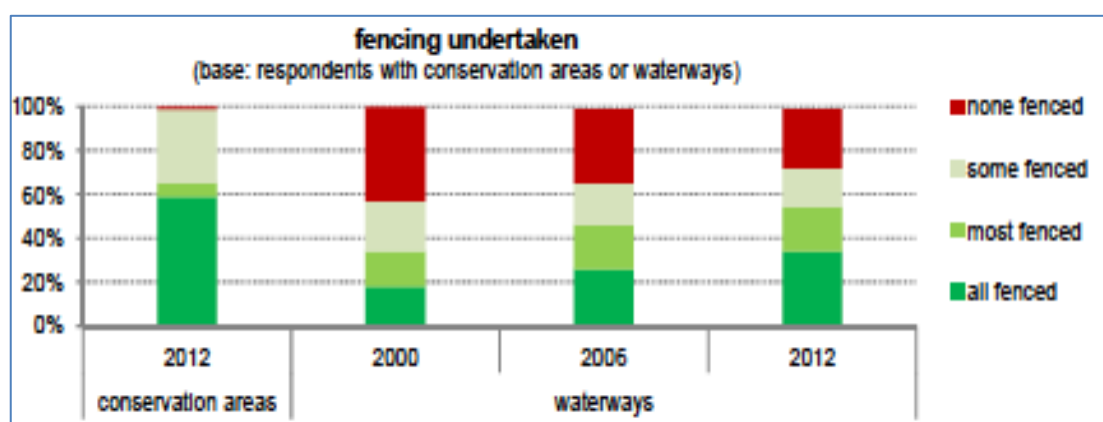


Figure 12
(Source: Down to Earth Research 2012)

Governance

Governance is only considered at a catchment scale (Section Four) not sub-catchment scale (Section Five) in the Standard. Principle 4 requires that governance in a catchment be *best practice* in relation to the following:

- Stakeholder participation;
- Respectful engagement with indigenous peoples;
- Availability of catchment information; and
- Establishment of catchment strategy.

In relation to (a) stakeholder participation, *best practice* is defined as:

- Representatives of the full range of stakeholder interests are actively engaged in catchment governance on an ongoing basis;
- The governance regime identifies, develops and implements appropriate, robust and balanced engagement strategies, plans and modes of engagement for stakeholders;
- There is an active program in place for building the capacity of stakeholders to engage effectively in catchment governance;
- Conflicts or dilemmas between different stakeholder expectations have been resolved to the satisfaction of all stakeholder representatives; and
- Representatives of the full range of stakeholder interests have taken part in decision-making.

Within the Goulburn Broken Catchment there is a wide range of opportunities for stakeholders to become involved in governance. These opportunities include (but are not confined to):

- The Catchment Management Authority Board;
- Participation in the CMA Regional Catchment Strategy;
- CMA Community Engagement Advisory Groups;
- Goulburn Valley Water Board;
- Goulburn Valley Customer Reference Group;
- Goulburn Murray Water Service Committees (for irrigation areas); and
- Goulburn Murray Regional Water Service Committees (groundwater).

The main issue would be the extent to which these bodies are representative of the full range of stakeholder interests given members are appointed as stakeholder representatives either by the agency concerned or by the State Government. While Government appoints the Board of the CMA, the organisation does go to some lengths to involve stakeholders in decisions with frequent consultation meetings. The on-line 'WeConnect' consultation mechanism developed for the recent revision of the Regional Catchment strategy provided open access for community comment. This was complemented by an extensive series of meetings attended by staff, the CEO and Board members. In addition, the CMA has supported the development of community groups to both participate in the CMA work program and advocate on behalf of different interests within the Catchment. An overview of CMA Community Advisory Groups is available from the CMA website. It discussed four types of advisory groups:

- Higher level coordination/reference groups;
- Program advisory groups;
- Project steering groups; and
- Other groups such as landcare groups and conservation management networks

The work of these groups supports CMA programs in the areas of sustainable irrigation, land and biodiversity, river and wetland health and floodplain management. Members of Program Advisory Groups are selected on the basis of securing a diverse representation of skills in the community.

In relation to (b), respectful engagement with Indigenous People, the Standard adopted as a placeholder text from the First Peoples Water Engagement Council Draft Policy Framework. It expects that:

There is an explicit program in place for engagement with Indigenous peoples in relation to water use and management, and which is recognised by Indigenous peoples within the catchment as respecting their rights to:

- Participate in decision-making in matters which would affect their rights, through representatives chosen by themselves in accordance with their own procedures;
- Exercise their free and informed consent prior to the approval of any project affecting their lands or territories and other resources, particularly in connection with the development, utilization or exploitation of water resources, and;
- Maintain and strengthen their distinctive spiritual relationship with their traditionally-owned or otherwise occupied and used lands, territories, waters and coastal seas and other resources and to uphold their responsibilities to future generations in this regard.

Best Practice is defined in the following terms:

- Aboriginal peoples are represented in catchment governance processes through their own representative institutions; and
- Aboriginal social, spiritual and customary objectives and strategies for achieving those objectives are incorporated into catchment level goals and mechanisms.

GBCMA acknowledges cultural heritage in its RCS. The Catchment has two main groups of Traditional Owners; the Yorta Yorta Nation in the north and, the Taungurung Clans in the south. The CMA raises awareness of traditional cultural knowledge and natural resource management among staff and partner agencies through employment of an Indigenous Facilitator, training and liaison with Traditional Owners. The RCS aims to build on collaboration efforts and the exchange of knowledge. Two projects are specified:

- Development of a natural resource management plan with the YortaYorta Nation to assist delivering programs and support the aspirations and values of the Yorta Yorta people; and
- A Memorandum of Understanding with the Taungurung Clans on weed control. This has also facilitated exchange of traditional knowledge, recording of cultural history and interpretive signage.

Goulburn Murray Water has adopted a similar approach in relation to its irrigation renewal project (formerly the Northern Victoria Irrigation Renewal Project, or NVIRP, now renamed as GMW Connections). The project engages Indigenous site monitors to assist managing cultural heritage impacts where irrigation upgrades are taking place. These monitors ensure the protection and preservation of cultural findings such as scar trees, discarded tools and middens. The Yorta Yorta Nation has also been engaged to provide cultural awareness training for both GMW Connections staff and employees of major contractors (CMW Connections web site).

There are clearly deficiencies within the Catchment in relation to Indigenous engagement based on requirements of the Standard. The main issue would be representation of traditional owners in decision-making structures. There is obviously a considerable amount of work being done to include consideration of Aboriginal spiritual, social and customary goals into both catchment planning and the implementation of those plans. Scope to improve representation of Traditional Owners in, for example the Catchment Management Authority Board would be beyond the scope of the enterprise or others within the Catchment in so far as appointments are made by the State Government in Melbourne.

In terms of (c) availability of catchment information, the Standard requires “there are effective systems in place for measuring, collating and making publicly available the catchment-level information that is needed to establish an effective catchment management strategy, and subsequently to monitor its implementation”. Best Practice for this element of the Principle defined as:

- There is an effective, catchment-wide system to monitor water flow, water quality, the status of important water-related sites and values, and the status of water-related infrastructure;

- There is adequate, catchment-wide data on water flow, water quality, the existence and status of important water-related sites and values, and the status of water-related infrastructure as the basis for developing a catchment management strategy;
- Data on water flow, water quality, important water-related sites and values and water-related infrastructure sufficient to monitor the achievement of catchment level objectives is collected, collated and made publicly available and
- Data about the allocation and use of water within the catchment is reliable, up to date, and publicly accessible.

As noted earlier there is extensive monitoring of this catchment and a great deal of data is published by different agencies and made available on-line. There is also a very strong understanding of allocation processes within the irrigation areas (less so in other areas that are upstream and not affected). In so far as there may be a weakness in relation to best practice it is in the collation and review of data. As noted, there is so much data available on flow it is difficult for users and groups within the Catchment to decide what is most relevant to their particular interest. For water quality, there is extensive monitoring but less analysis and interpretation of this data in a way that can influence actions of water users.

The Victorian Government (DSE) has completed two State wide assessments of trends in water quality (1998 and 2007) with a third currently underway (2012) although the methodology for the current review will be different. Data from 75 sites including 12 in the Goulburn Broken will be assessed against six variables (DO, pH, EC, TN, TP and turbidity). A 2008 paper analysed trends in the Goulburn Broken (Feehan Consulting 2008) and found the major issues for the Catchment were Total Phosphorous (TP) and turbidity while Dissolved Oxygen (DO) and acidity (pH) required surveillance. A summary of these reports is included at Appendix 5.

In relation to (d) Establishment of a Catchment Strategy the Standard requires:

There is an effective, long-term catchment management strategy in place that is compatible with the enterprise's commitment to the principles of water stewardship defined in this standard and which has been established through an equitable, participatory process.

It defines Best Practice as:

- An effective, long-term catchment management strategy has been developed;
- The catchment management strategy specifies catchment level goals that are compatible with the enterprise's commitment to the principles of water stewardship defined in this standard;
- The catchment management strategy was developed through an equitable, participatory process;
- The catchment management strategy is endorsed by representatives of all the previously identified stakeholder interests; and

- The catchment management strategy is publicly available.

The Regional Catchment Strategy has been one of the foundation documents for this field trial. It defines long-term goals for the Catchment and was developed through a participatory process. It is publicly available in both soft (electronic) form and hard copy. Two questions remain:

- Does the development and approval process meet the requirements of being an 'equitable' process and will it be 'endorsed by representatives of all stakeholder interests', and;
- Is the RCS compatible with the enterprise's commitment to the principles of water stewardship?

In relation to the first question, while not specifically stated in the draft RCS, it is assumed the final decision on the RCS will be made by the Board of the CMA. The Board is a body appointed by the relevant Minister in the Victorian Government. Although reflecting a diversity of interests it does not claim to be 'representative' of all stakeholder interests. The process for finalising the strategy, while participatory, could not be described as equitable between stakeholder interests, it will be a decision of the Board. Furthermore, decisions relevant to the strategy will be made by other agencies and the Victorian Government, in particular, decisions in relation to the flow permitted at different times of the year from storage facilities.

In relation to whether the RCS is compatible with the enterprise's commitment to the principles of water stewardship, the above analysis has shown:

- It is difficult to align the enterprise with a catchment flow regime because of the complexity of seasonal considerations and the extensively modified nature of the catchment. However, it is also acknowledged above that perhaps alignment with a specific flow target may not be the best way to ensure the enterprise is contributing to desirable catchment outcomes. An additional complexity is the point noted above, that decisions about flow are not necessarily made by governance mechanisms available in the Catchment but by State and Federal agencies;
- Water quality targets in the RCS are high level and would be a difficult or impossible basis for the enterprise to develop water quality targets. It would be better to specify quality targets at different monitoring points in the Catchment that would provide clearer goals for the enterprise and its suppliers (280 dairy farmers)⁴, and;
- The issue of stakeholder representation is relevant to Principle 4 (Governance) both in terms of Indigenous representation and broad stakeholder representation. Again this is complicated by the nature of the CMA and other bodies operating in the Catchment in that they are

⁴ CMA points out: Monitoring is expensive. We've been through a process of determining the most cost effective configuration of monitoring stations and have more than 80% of the area covered. There is an Irrigation Drainage Memorandum of Understanding process to develop more meaningful sub catchment targets; these won't be water quality target per se, but will be based on management actions which are assumed to give a water outcome.

established under State legislation and accountable to the relevant Minister ultimately.

Infrastructure

Requirements in the Standard relating to infrastructure require both the provision of adequate infrastructure and the maintenance of that infrastructure. In Part 4 of the Standard these are expressed generally in the following terms:

a) Provision of water-related infrastructure

The water-related infrastructure has sufficient capacity to:

- i) Manage water flow in order to achieve the catchment-focused water flow goals specified in 4.1.1, as specified by local targets defined in 5.4, below;
- ii) Supply clean drinking water for all households in the catchment;
- iii) Collect and treat all wastewater in the catchment to recognised standards before discharge to the environment; and
- iv) Meet demand for commercial water provision in the catchment.

b) Maintenance of water-related infrastructure

Water-related infrastructure in the catchment(s) meets agreed performance targets in relation to:

- i) Leakage;
- ii) Continuity of domestic water supply;
- iii) Treatment of wastewater; and
- iv) Continuity of water supply to commercial operations.

Two agencies have primary responsibility for infrastructure in the Catchment, Goulburn Murray Water (GMW) and Goulburn Valley Water (GVW). GMW manages water supply infrastructure and allocations. Its customers include irrigators and urban water supply companies such as GVW. It inherited the Northern Victorian Irrigation Renewal Project (NVIRP), now known as GMW Connections. The combined project is a \$2 billion investment in modernising irrigation infrastructure aimed at achieving long-term average annual water savings of 425 GL and improving water efficiency from 70 per cent to 85 per cent. It involves automation, remediation, metering upgrades and realigning channels to reduce water lost through leakage, seepage, evaporation and system inefficiencies.

GVW provides urban wastewater services to 129,000 people in 54 towns. Its service area includes most but not all of the Goulburn Broken Catchment as well as some additional areas. It operates 37 treatment plants, 26 wastewater facilities, 319 pumping stations, 119 tanks and reservoirs, 1700 km of water mains and 1200 km of sewers. The purpose of the organisation is to provide quality water services to residential, commercial and industrial customers within its service area. In doing so it is guided by four priorities: To provide safe drinking water; to ensure water and sewage services are continuous with interruptions; fees are affordable, and; to protect and enhance the natural environment (Goulburn Valley Water, 2012).

In terms of catchment wide high-level goals, GMW has a key role in 'achieving water

flow goals'. GMW is the Victorian Resource Manager appointed by the Minister for Water responsible for making seasonal determinations for all Victorian entitlement holders subject to state level determinations made by the Murray Darling Basin Authority. It does this within a set of strategic priorities that are primarily economic and social (for example, delivering reliable price pathway and contributing to a viable future for rural communities) without the environmental objectives of the Standard. This potentially sets up an inconsistency with the overarching goals of the Standard although it would be quite consistent with the Standard's requirement for 'meeting demand for commercial water provision'.

Requirements relating to servicing all households are not achievable under the current arrangements in the Catchment (and never will be). About half the population are in urban areas serviced by GVW while the remainder are in rural areas and rely on rainwater, surface water and groundwater and generally handle their own waste through septic systems or similar (composting etc.). That is not to say these households do not have access to clean drinking water or adequate sewage services. This would suggest requirements under this Principle need to be interpreted broadly (in terms of access to rather than provision of services) or the requirements need to change.

Both GMW and GVW have commitments to meeting quality standards. GVW reports on customer service performance in its Annual Report. This report also includes compliance with the Safe Drinking Water Act, EPA Licence requirements and wastewater targets. It prepares an annual performance statement for the EPA under its license as a sewage treatment operator.

In Part Five of the Standard, the enterprise is required to provide quantitative targets regarding the provision of infrastructure in the sub-catchment:

5.4.1 The enterprise has identified explicit, quantitative targets specifying the capacity of water-related infrastructure that is necessary to achieve the goals defined in 4.1.5 a), above.

5.4.2 The enterprise has identified explicit, quantitative performance targets for the maintenance of water infrastructure in the catchment in relation to:

- i) leakage;
- ii) continuity of domestic water supply;
- iii) treatment of wastewater; and
- iv) continuity of water supply to commercial operations.

5.4.3 The targets:

- i) are technically justified; and
- ii) are compatible with any locally applicable catchment management strategy.

GVW regularly reviews the capability of its infrastructure (water delivery and wastewater) to meet demands. Demand can be couched in terms of housing development or industry development. GVW gets industry input to this process. A problem is that industry often doesn't know what its future needs are and thus GVW tends to be reactive to industry needs, rather than proactive. The Corporation is trying to overcome this issue by beginning to develop a plan to enable quick expansion of infrastructure ('plans in the bottom drawer').

While it is expected that the enterprise will understand its own current and future infrastructure requirements (based on current business planning) and will have an understanding of the requirements of its farmer suppliers, it does not seem realistic that the enterprise would have plans developed for the whole catchment or sub-catchment. This is clearly the role of the relevant government agencies. As with flow regime, this is an example of where the best efforts of the enterprise to influence water stewardship may be through its involvement in governance rather than in preparing an independent assessment of future infrastructure requirements for the Catchment as a whole.

In 2012 TMI was listed as one of 19 major customers of GVW that used 50 ML or more of water at anyone site. The GVW Annual Report (GVW 2012) says it seeks to work closely with customers to reduce water intensity in production. TMI was listed as participating in Environment and Resource Efficiency Plans (EREP). GVW has included a column in the Table 8 for its waterMAP program. It is understood the EREPs (administered by the EPA) duplicate GVW waterMAP requirements and hence participation in that program has become voluntary. Nevertheless, reporting on water conservation indicates the Corporation is seeking to encourage its major customers to become involved in water use efficiency programs.

Major customer participation in water conservation programs 2011/12		
CUSTOMER	WATERMAP (VOLUNTARY)	ENVIRONMENT AND RESOURCE EFFICIENCY PLANS (EREPS)
Bega Cheese Ltd (Strathmerton)		✓
Campbell Australasia Pty Ltd (Shepparton)		✓
Energy Business Australia Pty Ltd (Cobram)		✓
Gouge Dry Cleaners Pty Ltd (Mooroopna)		
Goulburn Valley Health		
H W Greenham & Sons Pty Ltd (Tongala)		✓
Kamulla Holdings Pty Ltd (Seymour)		
Murray Goulburn Co-op Pty Ltd – MG Nutritionals (Cobram)		✓
Murray Goulburn Trading Pty Ltd (Cobram)		✓
Mushroom Exchange Pty Ltd (Nagambie)		
Nestle Australia Ltd (Broadford)		
Nestle Australia Ltd (Tongala)		✓
Riverland Oilseed Pty Ltd (Numurkah)		✓
SPC Ardmona Ltd (Mooroopna)		✓
SPC Ardmona Ltd (Shepparton)		✓
JBS Australia Pty Ltd (Cobram)		✓
Tatura Abattoirs Pty Ltd		
Tatura Milk Industries Ltd		✓
Unilever Australia Ltd (Tatura)		✓
Total	0	13

Table 8
(Source: Goulburn Valley Water, 2012)

The Enterprise

Action by the enterprise to address both its direct and indirect water impacts is at the heart of the Australian Water Stewardship Standard. The intent is that the enterprise identifies the most effective and cost-efficient actions it can take to contribute to Catchment-related and indirect water use sustainability, and that it prioritises and implements these actions. In the short-term the enterprise's performance will be judged against the self-selected actions taken within a three-year planning period. In the long term its performance will be judged in terms of the achievement of the higher-level goals defined by sub-catchment and indirect use goals.

The Standard notes that in most cases the achievement of catchment-focused goals will be beyond the control of the enterprise acting alone. The intent is that the enterprise will consider both the options for individual action, that are within its direct management control, as well as the options to encourage and support collective action, and actions by third parties. Options may include formal adoption of existing international, national or sector-specific standards or codes of good practice, uptake of measures and targets to improve water efficiency, participation in collective actions, action to influence third-parties, participation in river basin committees and participation in or support for actions such as improved land use management.

This section will consider direct impacts of the TMI Enterprise and the following section will consider indirect impacts (dairy farmer suppliers). Dealing with direct impacts by the enterprise is based on development of an effective action plan that identifies options available for the achievement of local catchment-focused goals (and indirect). The Standard requires that these be identified in terms of:

- a) The risks *to the enterprise* associated with the current level of performance in relation to the specified catchment and indirect water use sustainability goals;
- b) The risks *to other stakeholders* in the catchment, associated with the current level of performance in relation to the enterprise's catchment-focused goals;
- c) Cost;
- d) Potential impact on the achievement of the specified catchment and indirect water use sustainability goal(s);
- e) The enterprise's sphere of influence, or other barriers to success; and
- f) Potential social or environmental impacts of the possible actions on aspects other than the specified catchment-focused or indirect water use sustainability goals.

These actions then need to be prioritised into a three-year action plan that specifies current performance, actions to be taken, performance targets and expected impacts. The Standard notes that enterprises should prioritise actions with potential to significantly impact catchment sustainability goals and over which they have greatest control (taking into account the limitations of the enterprises' 'sphere of influence'). The action plan is required to be available as a public summary. The reason for this, the Standard notes, is that:

The Standard is primarily a 'process' rather than a 'performance' based standard. The process-based approach is demanding to implement but, it

does not specify particular thresholds in relation to aspects of enterprise level performance. A high level of transparency is therefore essential to underwrite the credibility of the water stewardship program based on its implementation.

For the purpose of this trial, TMI did not develop a specific enterprise action plan. However it was noted the development of a plan could be incorporated into current planning and review cycles that are undertaken by the enterprise (for example in relation to waste water management). It was expected that catchment goals could be overlaid onto this process providing they were relatively clear in setting meaningful objectives for enterprises in the Catchment.

In relation to specific requirements of the Standard, a full analysis is attached at Appendix 6. Key findings for each Part of the Standard are set out below.

Part 4 - Long-term catchment-focused goals

In a highly regulated catchment such as the Goulburn Broken, an enterprise is more likely to be a receiver of established goals rather than an initiator. Indeed the volume of catchment material makes deciphering goals aligned with the Standard, as this report has found, a challenge in itself. What would be more appropriate in a catchment such as the Goulburn Broken would be for the CMA to produce a set of overarching goals aligned with water stewardship principles. The contribution of the enterprise would be in encouraging the production of these goals, aligned with the principles of the Standard, through its participation in the governance processes available. While in the Goulburn Broken this may simply be a matter of condensing and deciphering, in a less regulated catchment the enterprise may need to contribute by establishing an appropriate governance regime to lead the development of these goals.

Part 5 - Local specification of catchment-focused goals

In relation to sub-catchment goals or measures specific to the enterprise it is noted that some catchment level goals are more adaptable to enterprise level specificity than others. For example, water quality measures can track direct influence of the enterprise (or some influence depending on the proportion of the enterprises contribution at the point this is measured). This is particularly the case where there is extensive measuring through the Catchment and the Standard is dealing with a major industry such as dairy in the SIR. However, flow regime is the complex interaction of many forces such as seasonal conditions, time of year and the impact of central government decisions. While each individual enterprise contributes to the overall catchment demand, the quantum cannot necessarily be disassembled by the actions of an individual enterprise. In that respect, contribution of the enterprise to catchment governance may be more important although the role an enterprise plays in achieving outcomes is more important than defining the role for the enterprise within the governance regime. Equally, while a site can take clear responsibility for special sites and values under its control, it can only be a contributor to outcomes more generally throughout the Catchment.

As will be discussed later, a preferable approach would be for an enterprise to work with the agency responsible, in this case the CMA, to define goals relevant to the enterprise (and in this case its key suppliers) that are in line with the Standard. This would make the process more efficient and encourage others in the Catchment to become involved in both defining and achieving outcomes in line with the Standard.

Part 6 - Long-term goals for indirect water use

This will be dealt with separately in the following section of the report.

Part 7 - General provisions for implementation

Generally it was found that there were policies in place at the enterprise to address issues such as training, accidents, emergencies, and disputes. These were generally designed for internal purposes, legal compliance or for compliance with other standards. It was felt that prior to a formal certification process each of these would need to be reviewed to ensure compliance with the Standard.

Part 8 - Legal compliance

Compliance with laws and regulations is the responsibility of the Operations Manager at the enterprise. Additional work may be required to create a compliance central registry and ensure contractors are regularly updated on requirements. It was felt the industry body could play a role in centralising this function.

Part 9 - Three-year enterprise action plan

This Part was dealt with at the start of this section

Part 10 - Monitoring performance in relation to catchment-focused goals

The Field Trial showed that direct water inputs were recorded. Potable water was well recorded although there was some confusion around recycled water. The water service provider (GVW) records input water quality but the enterprise is not necessarily made aware of the results. Output quality is measured in order to meet the enterprises requirements under its discharge and trade waste licence from the EPA.

There is scope to increase the involvement of the enterprise in management of local wetlands however the CMA would need to identify any in addition to the High Value Wetlands listed in the RCS.

Part Ten seeks an assessment of water governance in the Catchment. While the relevance of this can be seen in the context, of say, the Lake Naivasha Field Trial in Africa, for the Goulburn Broken the goal could be broadened to include involvement of the enterprise in governance activities and outcomes achieved (in terms of the Standard's principles). This would both acknowledge the extensive governance arrangements in the Catchment and encourage the enterprise, within the scope of its influence, to use the governance opportunity to achieve the goals of the Standard.

For infrastructure, there is considerable information available on catchment infrastructure from the two agencies responsible in the Catchment (GMW and GVW). As with flow regime, the enterprise may be able to play a constructive role contributing to that infrastructure being aligned with catchment goals that are, in turn, aligned with the Standard through the governance processes available.

Part 11 - Measuring and monitoring indirect use

This Part will be explored in the following section.

Part 13 and 14 - Reporting and records

These sections would be activated in the event of an actual certification. However it would be possible for an enterprise to start to develop a consistent set of water reporting metrics that reflect the requirements of the Standard prior to certification. In the case of the dairy industry, this could be through, for instance, aligning the requirements of DairySAT with metrics contained in the Standard. Commercial confidentiality has been identified as an issue as a competitor can gain some insight from analysing plant water use and discharge data. It should be noted here that not all records relevant to the Standard are held by the enterprise and may be held by one of the water service providers (GMW or GVW) or the CMA.

In terms of requests for data, this would be a new initiative for the enterprise and an appropriate policy would need to be developed. Similarly, for stakeholder engagement, while there has been some engagement with stakeholders a more regular and systematic process would require the enterprise to develop some internal guidance and protocols for staff.

Overview

TMI has developed an approach to water that suits their business and meets legislative and planning constraints as well as market requirements on matters such as food safety and quality. This approach already covers many of the requirements, or at least the intent, of the Standard. Specific gaps and issues are detailed below.

The analysis raises the issue of enterprise level compliance versus whole of catchment approach and the interaction between the two. Many of the gaps noted rely on external inputs and actions from the water service provider and the Catchment Management Authority. In this case, the CMA, GVW and GMW are highly active and cooperative but this may not be the case in all catchments (as noted in other trials). The Standard encourages and there is scope to explore alternatives for aligning catchment goals with the Standard and aligning enterprises with those goals.

The following are matters to be considered in future development of the Standard.

- Some principles and catchment goals translate more readily to enterprise actions than others. For example, discharge quality can be readily understood however flow regime can be more abstract. The challenge for the Standard is to find a simple mechanism to promote outcomes aligned with the principles in a manner that is realistic and achievable for the enterprise.
- Issues surrounding water related sites e.g. environmental sites or cultural heritage sites are areas where specific goals and management have not been considered much in the past and mechanisms in the Standard should focus on achieving outcomes that are realistic for the enterprise.
- Enterprises understand infrastructure at a plant level (input, waste) and their requirements from catchment or regional infrastructure but broader goals such as continuity of domestic water supply may be beyond their ability to

influence other than in a corporate citizenship capacity and the Standard should reflect this.

- For indirect water the plant knows inputs and water content (e.g. of ingredients) but not 'embedded water' as envisaged by the Standard and the Standard may need to consider a phased approach to deepening understanding of water inputs.
- A phased approach to the inclusion of inputs should be considered so as to focus on major water consuming inputs first and then work progressively through the supply chain. Given the level of understanding of indirect water use it will take some time for the enterprise to develop an understanding of this other than in a general sense.
- Current review cycles should be adapted to incorporate planning and actions anticipated by the Standard. E.g. planning for supply and planning for wastewater (with GV Water).
- The issue of appropriate guidance for stakeholder engagement, making information public and reporting needs to be considered.
- A lot of measurement is done on plant. Water balances are complex but generally meet the intent of the Standard. Some measurement is done off site e.g. by GV Water, waste water and potable water quality. The plant is not necessarily aware of these results.

Indirect water use

One of the objectives of this trial was to test how individual farmers can most efficiently be included in a water stewardship system. It was felt that the best way to do this was to build on linkages that already exist. In this case, the linkage was between individual farmers and the milk factory. The factory has an existing relationship with its supplier farmers based on securing adherence to quality and performance standards that meet regulatory and customer requirements. Through certifying the factory, the supplier farmers are included as indirect use by the factory and this provides a mechanism for their inclusion in the certification process. The following discussion will examine the implications of this approach.

The Standard has fairly general goals in relation to indirect water use ranging from all suppliers becoming certified suppliers to an enterprise assessing and mitigating risks. The broad objectives are set out in Part Six and require that the enterprise be formally committed to achieving two goals in relation to indirect water use;

- a) Sourcing from sustainably managed catchments (all of the enterprise's indirect water use is from sustainably managed or 'low risk' catchments); and
- b) Avoiding water from non-renewable resources (the enterprise's indirect water use does not deplete non-renewable resources).

Part Nine of the Standard requires that the enterprise establish goals for indirect water use as part of its three-year action plan. This is further elaborated in Part Eleven (the most prescriptive part of the Standard in relation to indirect water use). This Part specifies requirements for measuring, monitoring and evaluating risks associated with indirect water use.

The intent of this section is to ensure that the enterprise can monitor its indirect water use, and calculate the proportion of its indirect use which is from certified water stewards or catchments which are considered to be 'low risk' in terms of impacts. In order to do this, the enterprise needs data provided by its suppliers. The Standard requires water stewards to make this data available. The data in turn allows water stewards to assess the quality of their indirect water use, in terms of the five water stewardship principles.

So, in summary, the Standard requires that an enterprise evaluate and measure its indirect water use and undertake a risk assessment of non-certified suppliers in relation to the five water stewardship principles. It then needs to develop a plan managing these suppliers in line with water stewardship requirements as part of its three year Action Plan with a view to (in this case) contributing to a sustainably managed catchment.

General issues

In the case of TMI the most significant indirect water use was its dairy farmer suppliers (although not exclusively as other suppliers used at the plant, such as palm oil producers, are also water intensive). As listed earlier, milk is obtained by the company from about 280 dairy farms spread through the irrigated plains of the Shepparton Irrigation Region between Murchison and the Murray River which is part

of the Agricultural Floodplain Social Ecological System identified earlier. The farms range in size from small herds of 40 up to more than 1 200 cows.

TMI indicated concern regarding the engagement of farmers in the trial.

Some issues mentioned to the Project Team were:

- Most are essentially small businesses who feel they already need to deal with a growing regulatory burden and don't need to voluntarily take on additional compliance requirements;
- There did not seem to be a compelling reason to subject themselves to this additional compliance burden if there was no clear reward or payback;
- There were a lot of other pressures for change such as market changes affecting price that were of greater concern to farmers;
- The industry already had a best practice management standard –DairySAT – and water stewardship was only one part of this program; and
- From a TMI perspective, there was a reputational issue in taking water stewardship to its farmer suppliers in the context of these concerns.

At the same time, the industry generally was facing growing scrutiny from customers who were seeking to fulfil their own supply chain sustainability requirements. For example, during the course of the trial, TMI and Dairy Australia were dealing with a major international food group that was developing its own Sustainable Agriculture Code. This Code covered continuous improvement, chemicals and fuels, soils, water, biodiversity, waste, energy and GHG, social and human capital, value chain on local economy, animal welfare and training. Major supermarket chains in Australia were moving in a similar direction in managing their supply chain issues. A key opportunity for the trial was to demonstrate how water stewardship could fit with these initiatives that were seeking compliance within a supply chain.

A key to obtaining farmer involvement in water stewardship was in the ability of the Standard to link with existing mechanisms such as DairySAT (or similar programs) in a way that could deliver outcomes that would help to meet customer compliance needs. At the same time, as was recognised earlier, how could existing catchment targets, as expressed in the RCS, be included to streamline and align process that to this point has been without strong alignment. As part of the trial, DA considered whether its DairySAT, which is currently under review, could be used as the basis for a simple questionnaire for farmers to test the alignment between their on-farm practices and water stewardship requirements. Two sample questionnaires (see Appendix 7) were prepared to guide discussion by the stakeholder reference group as to whether this was a suitable approach to developing assessment or pre-assessment tools for the enterprise.

Three issues emerged from this approach:

1. Was compliance with the DairySAT checklist sufficient to indicate compliance with the Standard?;
2. How would a red, amber or yellow response system meet the requirements for evaluating all suppliers? Would acceptable practice (amber) be sufficient to meet the requirements of the Standard?; and

3. What would the mechanism be for evaluating all suppliers? Would a 75 per cent amber response by all farmers, for instance, be sufficient to meet the needs of the Standard?

WSA subsequently undertook an evaluation of the proposed questions against the requirements of the Standard. These are attached as Appendix 8 and 9. The work showed that this approach to using DairySAT could provide a good indicator of compliance although it was stronger on some principles than others. For example, it did not address the Governance Principle. However, the main innovation discussed for potential inclusion in a revised DairySAT was a whole farm plan which had good potential to provide a vehicle for bundling a range of compliance measures including water stewardship into a single package. As Dairy Australia pointed out in its paper (attached), whole farm plans (WFPs) are already widely used by most farmers (although as was noted at a meeting with farmers to consider these proposals, not all are kept up to date):

“WFPs are required under the Goulburn-Broken Catchment Management Authority’s Shepparton Irrigation Region Implementation Plan for eligibility for various incentive programs, such as the federal On-Farm Irrigation Efficiency Program under the proposed Murray Darling Basin Plan. WFPs map existing farm features, detail proposed improvements, and are especially important in working towards improved water use efficiency)” (DA Paper attached).

As to whether this approach would be enough to meet the requirements of the Standard, the answer was ‘Yes, it could be’, depending on how it was implemented. This is because the current Australian Standard does not specify detailed compliance criteria for indirect use but rather a risk-based approach based on the five principles of water stewardship. With some adjustments, a questionnaire based on the DairySAT could provide that risk assessment tool for an enterprise in assessing its suppliers. TMI already uses DairySAT as the basis for its BEMS tool through which it is seeking to promote common approaches to environmental management with its suppliers.

The answer to the third question above lies in implementation of a fairly common mechanism utilised by conformity assessment programs: group certification. This is an approach where one entity (TMI) acts as a ‘group manager’ and secures compliance of separate entities (farmers) to a common management system. The group manager in effect acts as promoter, consultant, trainer and internal auditor to gain alignment within the group (not entirely dissimilar to current extension service). Clear processes, training and record keeping need to be maintained as well as an approved standard management plan that is adopted by the group. Compliance of the whole group is thus verified through an audit of the Group Manager, the management plan and a random sample of group members (generally \sqrt{x} where x = the number of group members). For a group of 280 this would mean 17 farms. However, it is important to note that certification of the group would not be an immediate requirement for compliance with the Standard. The immediate need would simply be to demonstrate that the enterprise was managing its indirect water sources through this mechanism and managing those sources to a low risk level.

Detailed analysis

WSA did undertake a detailed analysis of these issues by examining current on-farm practices, overlaying potential updates to DairySAT requirements and then whole

farm planning as practised in the SIR. It was felt that each level offered increased levels of compliance. However the process underlined the need for the enterprise to work closely with the CMA, RCS, Dairy Australia and water service providers such as GMW and GVW in order to set goals and targets against the water stewardship principles or meet some specific requirements. A full report is at Appendix 10.

A key finding was that the group approach to compliance seemed the only realistic option when compared to individual farm compliance. A group approach could be constructed around existing supplier approval arrangements such as BEMS.

A caveat to the findings is that the SIR offers relatively few challenges in terms of run-off risk because most farms are on flatlands with well-established methods for recycling water to a low point on the farm. This may not be the case in other dairy regions around the country. In addition the whole farm planning program is not a universal program around the country and so the benefits in terms of compliance to the Standard can only be read in the context of this region.

Observations on current farm practices:

- Flow regime targets and goals are complex for farmers who will not see these as a single target but an array of targets depending on season, time of year and where they are in relation to the river; the targets and goals will also be governed by the allocations system.
- Farmers do not have much direct say or control over flow regime. It is a governance issue beyond the control of the individual farmer. Flow onto the farms from rivers and irrigation channels is always metered (so always in compliance with allocation).
- Farmers are involved in catchment governance through various groups and associations but this is voluntary.
- Water related sites and values are not formally considered by farmers but some are legislated, e.g. penalties apply for disturbing cultural sites.
- Stakeholder consultation is not a function farmers can be reasonably expected to undertake. There is reliance on CMA and industry level.
- Some of the various targets for quality, quantity and infrastructure for example are more relevant to farmers collectively (as a group).
- This points to a group compliance model based on current TMI supplier contact.
- For the Standard's requirements on infrastructure, some sort of simple maintenance program may be required on farm.
- Indirect water use on farm is hard to quantify and probably not significant, for example fertilisers, chemicals, fuel.
- Most farmers don't keep up with legislation. Is this a role for DA to maintain a register of laws and regulations?

- Review and actions could be rolled into existing TMI practices (BEMS), using existing random audit of farms. This is a group scheme approach (which needs to be formalised).
- This could be linked to review and update of BEMs and DairySAT.
- Large farms could do all this individually but a group approach would suit smaller operations.
- Stakeholder consultation may be a challenge. Farmers may not want a focus at farm level.
- Similarly reporting needs to preserve privacy and confidentiality.

Observations on how a revised DairySAT would improve compliance:

- Explicitly requiring a farm plan and a plan approval process covers off many of the requirements of the WSA Standard. Even so there will still be aspects that farmers can have no influence over, although reference to these could be inserted in, for example, a template farm plan for a district.
- Guidance would be required on, for example; “What do you need in your whole farm plan?” This would need to be regularly updated (by Dairy Australia or TMI). This guidance or a template farm plan would help farms be to be consistent with local targets.
- The requirement to have an overall effluent management system capable of coping with current herd and infrastructure goes some way to covering water quality criteria in terms of emissions from an individual property. DairySAT currently does not cover off the Standard’s requirement to maintain infrastructure in good order. This would simply require an additional question such as: ‘Do you have a record of maintenance of infrastructure to demonstrate it is working effectively?’
- Consideration of ‘special sites’ is an overall weakness in the on farm situation. DairySAT additions could require active management in these areas, for example; a plan to manage biodiversity and habitats to improve their condition through grazing management and pest control, stock excluded with permanent fences, and establishment of off-stream drinking points to protect riparian or wetland areas. This question was asked of farmers who participated in the *Dairying for Tomorrow* survey (Down to Earth Research, 2012). Rare and endangered species lists are available from public sources⁵ however many people are likely to need assistance to manage this issue.
- The DairySAT checklist does not specify document procedures. This could be a gap or it could be addressed either (a) by defining a documented procedure or (b) through a template farm plan process. An example of a documented procedure may be to use industry best management guidelines for effluent management or a simple flow plan may suffice.

⁵Examples of publically available resources on biodiversity. <http://www.dse.vic.gov.au/plants-and-animals/native-plants-and-animals/threatened-species-and-communities/listed-items>
<http://mapshare2.dse.vic.gov.au/MapShare2EXT/imf.jsp?site=bim>

- DairySAT does not cover farm establishment directly although measures taken at establishment, such as development of infrastructure may assist in meeting requirements of the Standard.
- DairySAT may consider including a requirement for knowledge of (or ability to access knowledge) of legal and regulatory requirements (for example, effluent and native vegetation). Farmers are likely to look to Dairy Australia or TMI rather than each individual having to keep up with every change and nuance to legislation.
- DairySAT is about effective actions. What is not covered is appreciation of impacts, barriers to success and alignment with catchment goals. Some of this could be built into DairySAT or a template management plan that would be the basis for the company interaction with suppliers.
- Asking farmers if they are aware of water-table salinity on-farm covers only one aspect of water quality. DairySAT or a group scheme could be extended to require that the farmer or group of farmers have access to other water quality measurements taken locally.
- DairySAT does not consider indirect or stakeholder values impacts. This is probably something DairySAT is not trying to achieve but again, could be included in something like a template management plan.
- A DairySAT checklist is not a public document so does not cover the Standard's requirements to make some information publically available. Some other mechanism for publication needs to be considered. This may be better handled at a group level.

Observations on how a Whole Farm Plan (WFP) improves compliance:

- WFP's as practised in the SIR are linked to the CMA strategic goals but are not specific to one industry such as dairy.
- There is not a strict relationship in the WFP to the Standard's principles but there is consistency on flow regime and special sites and values.
- In the WFP inspected for this trial, quality goals (salinity control) and governance are implicit but not specified. These wider goals could better link to water stewardship through the WFP program if the relationships to CMA goals were clearer.
- WFPs are related to infrastructure at establishment or improvement of the operation rather than infrastructure in general or the requirement to maintain infrastructure.
- The WFP does have an indirect relationship with the goals, objectives and targets in the Standard but how is unclear. For example, WFP reflects objectives at a CMA level but they are not made clear. A closer relationship between the WFP and these could be established and referenced.
- A significant value in the WFP is that it requires a description of the sites' values plus protection and enhancements but, the reference point for these

values needs to be made clear for landowners. Further, the WFP is not clear on how these values and their protection are to be monitored at farm and enterprise level.

- The WFP is not a documented procedure as anticipated by the Standard but is part of the documentation that describes how water stewardship is implemented.
- The WFP look at site establishment and expansion in detail and probably exceeds the requirements of the WSA Standard in this respect but, it does not look as strongly at ongoing management practices.
- The WFP program identifies options and actions for 'risks' such as water quantity and quality as anticipated in the Standard. The fact that there are regular reviews of the plan supports this. The review cycle and process need to be explicit. The WFP cycle is potentially 3 years, in line with requirements of the Standard.
- Review of the WFP program could form part of an assessment and review of catchment infrastructure as anticipated by the Standard.
- Ongoing measurement of performance is not clear in the WFP. It deals more with infrastructure to deliver controlled volumes and efficiency rather than measurement of volume and efficiency.

Overall it was felt that a modified WFP could be referred to as a farm management plan and take on a central role in the integration of individual farmers into the water stewardship system. It was felt that this could be done in a way that increased credibility for the industry while reducing complexity and the compliance burden through building on existing mechanisms and relationships.

Proposed way forward

In considering the foregoing, WSA has proposed the following approach for moving forward with a stewardship system that meets the requirements of the dairy industry's market, its stakeholders and participants such as farmers and factories.

Figure 13 represents in a stylised way the current situation facing the industry generally but more specifically, farmers in the SIR. There is a set of catchment goals that have been developed but do not link all the way through, in a direct cause and effect sense, to individual farmers. There is an industry BMP program (DairySAT) that is well established but in need of review and at present only utilised by approximately 11 per cent of farmers (DA 2012). TMI has its own version of these BMPs in its BEMS framework. At the same time, there is a developing requirement from customers to meet their sustainable supply chain and production goals. In the background there is an ongoing issue with the EPA on water quality impacts and concern from stakeholders about the health of the Catchment generally (with abstraction of water for irrigation a major factor in this concern).

There is a concern from the industry that water stewardship would add complexity and compliance costs without delivering a clear additional value to farmers or companies.

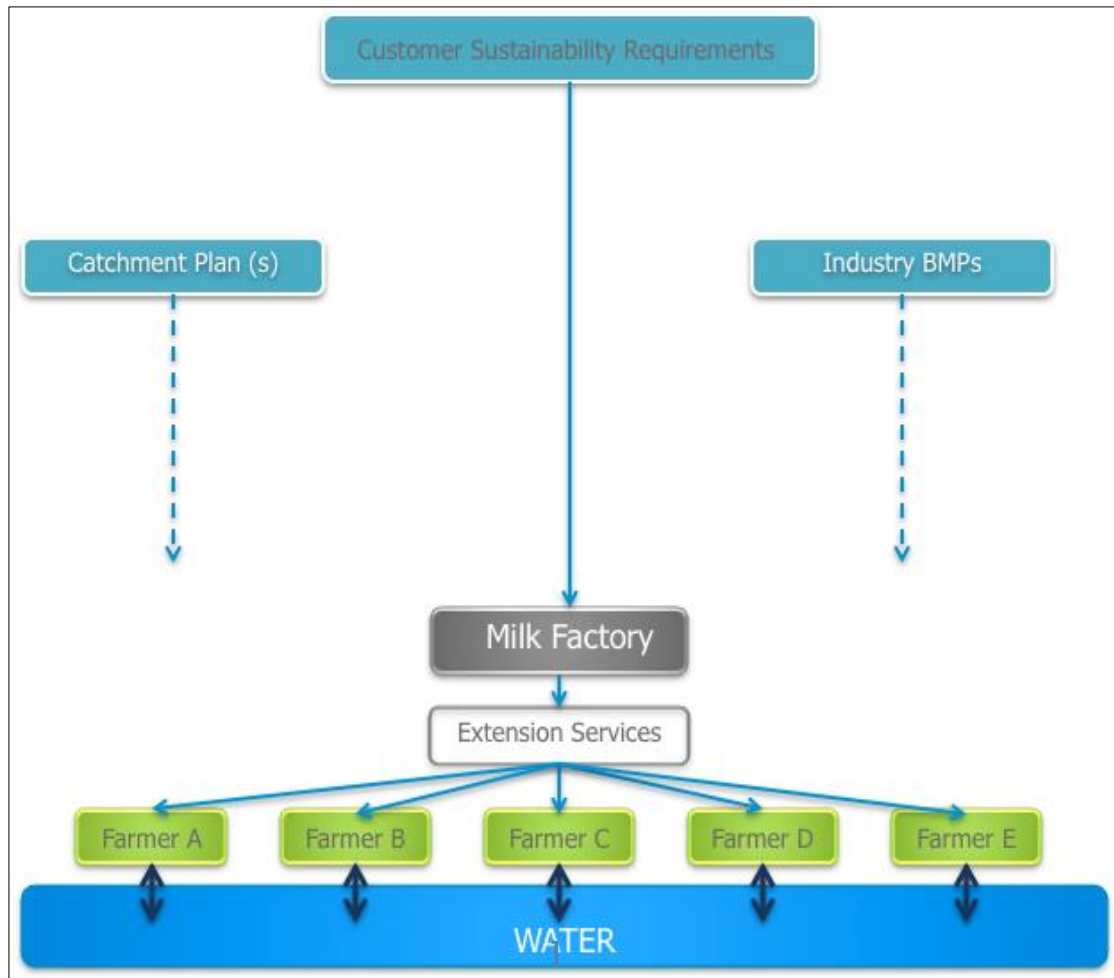


Figure 13

Figure 14 introduces water stewardship as a mediating intervention that can speak directly and with the authority of an independent system, to customers, suppliers and other stakeholders while assisting to align existing systems. Water stewardship can cover requirements relating to water flow, water quality, special sites and values, governance and infrastructure. It is important to note that water stewardship is broader than water flow (this is a communication issue WSA needs to address). In order to provide this service, water stewardship need to establish its authority based on full stakeholder participation and compliance with global norms for conformity assessment programs and verification processes. One form of compliance is the ISEAL Code of Good Practice for Standard Setting organisations. However, the Standard also needs to be realistic and achievable in order to gain the participation of industry.

From the framework outlined above, the Standard can influence both the format and the process for developing catchment strategies to highlight areas where factories and growers need guidance. One way to do this would be through a formal guidance note that could accompany the Standard. Organisations seeking certification could then use their influence through government processes to gain the cooperation of a catchment authority. Where no such authority exists, the obligation of organisations seeking certification would be to promote a governance regime that could develop a plan and set targets for a catchment. The guidance for catchment authorities would influence the process for developing catchment targets by seeking to ensure the full range of relevant stakeholders were involved in its development. It is recognised that

this will be complicated through legislative requirements and the role of central government. However; here it could be possible for an enterprise seeking certification to obtain bonus points for innovation by devising a breakthrough strategy.

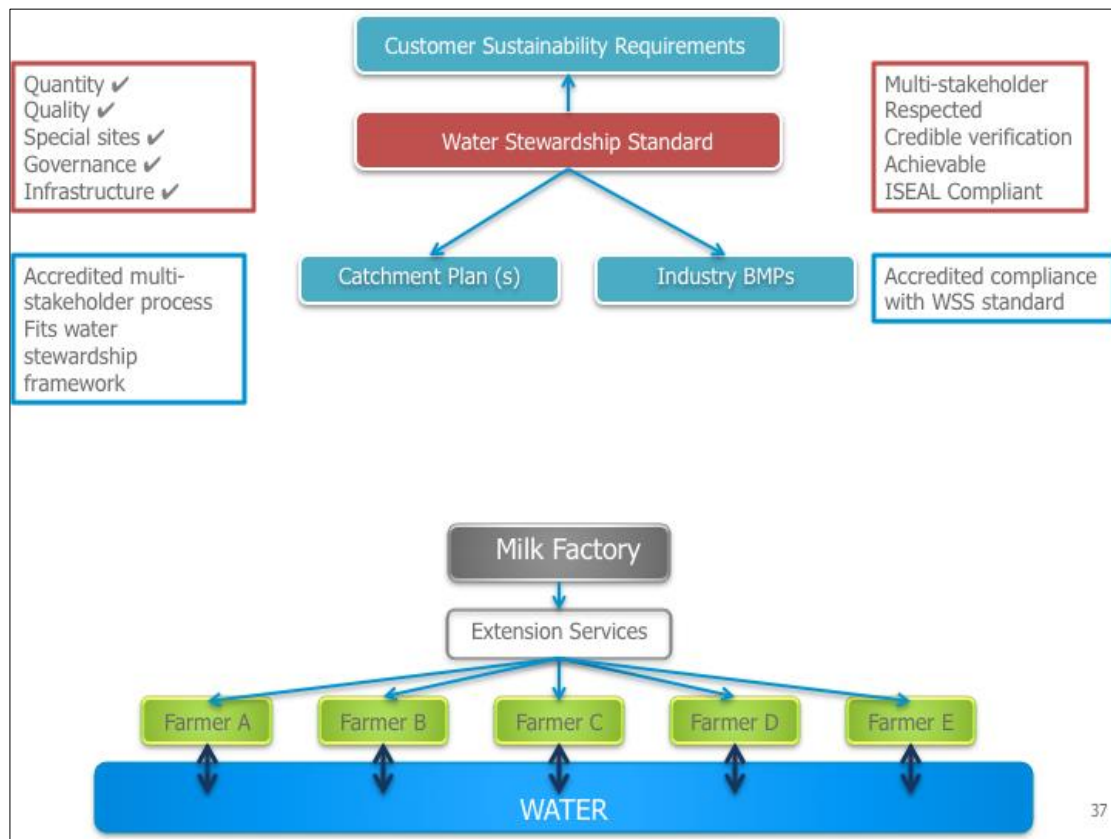


Figure 14

There is an obvious gap in the Figure above and that is in how this process is linked to the farmers. Here the strategy discussed earlier is employed as illustrated in the Figure 15. That is, the introduction of a group approach.

The group approach is illustrated below with the milk factory acting as Group Manager building on its existing extension service relationship with farmers (for all sustainability issues, not just water). Instead of a diversity of programs being communicated to farmers, the basis for the relationship becomes a standardised farm management plan (WFP-plus). The factory develops the plan in association with the industry and the CMA. The industry provides BMP inputs and the CMA inserts relevant catchment goals and targets. In fact, it could be possible for the industry to prepare a base plan and the CMA to insert regional variation into the plan that could then be passed to the factory for implementation. The standardised farm management plan could also be the basis for other compliance issues such as chemical use, GHG emissions, etc. The factory would then be responsible for appropriately monitoring compliance as part of its extension and quality control work. As noted earlier, it would not be a requirement for the group to become a certified group immediately in order to be compliant with the Standard. It would be sufficient for the factory to demonstrate that it knew its indirect water use, had evaluated risk and was implementing an action plan to bring that risk to low or maintain that risk at low. Over time, it would be necessary to move to certification. At this point, the factory would be audited as a Group Manager (in addition to its own performance),

the management plan would be audited and a representative sample of group members would be inspected for compliance with the management plan.

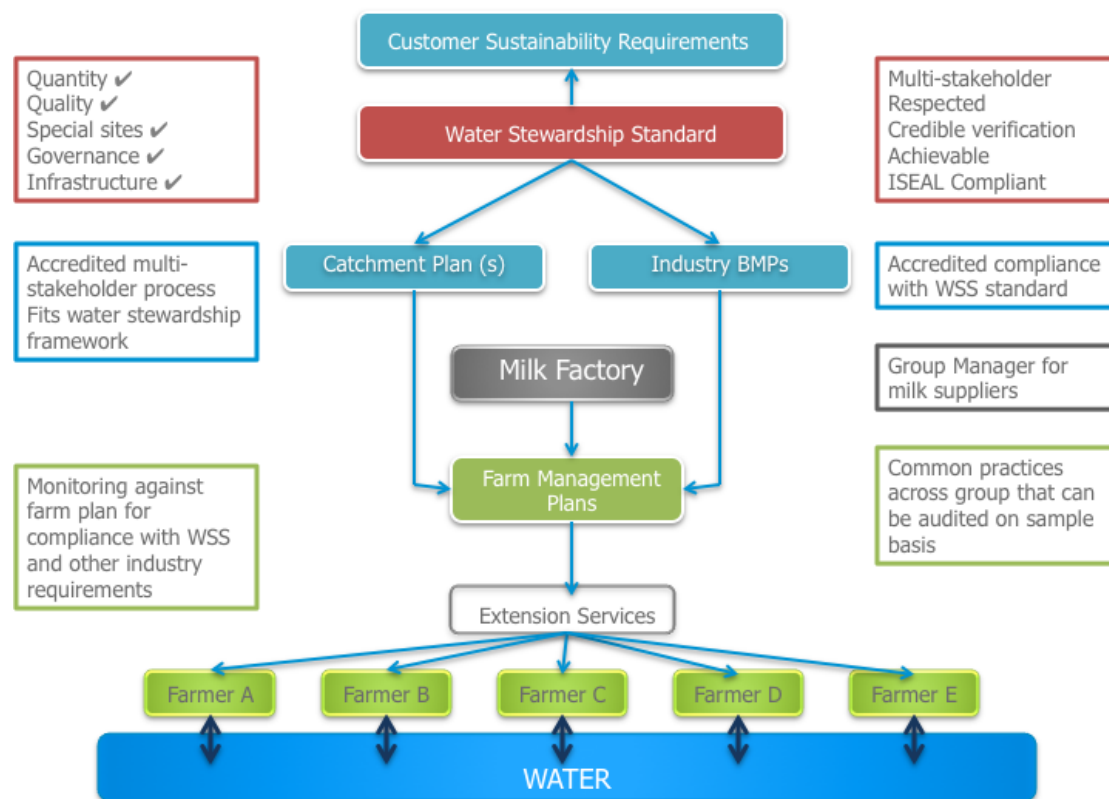


Figure 15

Conclusions

The above approach appears to meet many of the issues raised in this field trial. However, as mentioned throughout this report, this solution would not necessarily be appropriate to all situations and ongoing testing of the Standard is important. For example, in industries where there is not the same strong relationship with a central aggregator of product, this approach may be more problematic. In a catchment where there is not a strong governance regime or no governance regime a different approach would be required (although similar principles could be adopted). The approach encourages cooperative relationships between industry and catchment authorities using the Standard as one tool (water and elements of biodiversity) along with a number of others that may be codified in law or other voluntary systems.

Auditability

Lloyd's Register Quality Assurance (LRQA), an international certification body, was engaged by WSA to perform an assessment of the Standard and report on whether it was a practical tool for conformity assessment. The intent was to test the Standard by considering whether, for each requirement, the assessor would be able to reach an opinion on conformance with the Standard for a given enterprise seeking certification. The section below is the Executive Summary on this assessment. The full report on this work is attached at Appendix 11.

LRQA assessment findings

Assessment of the Standard was performed based on our assessor's knowledge of a range of industries and organisations and their approach to environmental management. LRQA assessed each clause of the Standard, provided examples of typical audit evidence that we would expect to see in order to support assessment of a requirement, and presented findings and recommendations on various issues likely to be faced during a certification assessment. This has been presented in Section 3.

In summary, we found that an assessor would likely be able to reach a conclusion on all of the requirements, although in many instances there is ambiguity about the extent to which the enterprise would be expected to go to in order to meet the requirement. This chiefly relates to the situation where an authority does not enable the catchment-focused goals, targets and monitoring required, which is discussed in Section 1.2, and Section 3. Without further guidance on this issue, it is likely that inconsistencies will be applied by different auditors in assessing the Standard, resulting in inconsistent certification decisions.

Catchment-focused goals and the collaborative nature of the Standard

The Standard requires catchment information that is generally the domain of an applicable authority. Where this information is unavailable and the authority is either unwilling or unable to assist the enterprise in meeting the requirements, much of the Standard becomes problematic. In such a case it is unclear what the expectations are of the enterprise. For example, is demonstration of "intent" (albeit unsuccessful), sufficient? If so, the Standard cannot be considered to be outcomes-based, in that it would be possible to certify organisations in catchments lacking appropriate governance, so long as the enterprise tries to engage with the relevant authority (with no success).

LRQA assumes that this is not an appropriate outcome where the enterprise has a significant impact on a catchment (and hence other stakeholders and water users) or where the enterprise is significantly exposed to water risk in some way. In this case, the assessor would need to judge what could be reasonably expected of the enterprise, and this is likely to require consideration of the level of impact or risk. If so, guidance would be needed.

Let's take an extreme case where a Water Steward has a significant water impact or is significantly exposed to water risk and is well resourced technically and financially and operates in a catchment where the authority does not provide any of the requirements of the Standard. Based on the requirements of the Standard, would it be reasonable to expect the enterprise to:

- Undertake its own assessment of water flow, groundwater management, use of non-renewable groundwater resources, water quality, important water related sites?;
- Implement its own monitoring program for the required indicators (off site)?;
- Undertake its own stakeholder engagement process and make available catchment-level information to the public?;
- Develop a catchment management strategy?; and
- Provide water-related infrastructure for other users in the catchment?

If such a Steward was required to implement the above, then the contrast between it and an urban water user with a token “adopt-a-wetland” program is pronounced. It is also noted that it may not be possible to meet some of these, even with unlimited resources (e.g. infrastructure provision, even if paid for by the Water Steward, would require agreement from the authority, consents etc.).

Consideration of enterprise scale using a case study

The assessment of the reasonableness of the requirements discussed in above requires an understanding of the relative significance of the enterprise. Using results of a field trial performed by Water Stewardship Australia (WSA) at enterprises that could be considered “medium” (a food processor) and “small” (farm), LRQA explored some of the key issues identified in the findings. This information provided a useful context in which to inform LRQA’s opinion on the applicability of the Standard at the two enterprise scales, as summarised below.

An enterprise that has a substantial impact on catchment or is significantly exposed to water risk.

- It would be expected that the enterprise would have to have a significant level of communication and involvement with the local catchment management authority.
- Difficulties may be encountered in meeting the requirements of Sections 4, 5 & 6 of the Standard depending on the availability of access to such a body, their willingness to allow the involvement of a commercial operator in catchment governance and the availability of the required flow and quality data.
- The enterprise would need the ability to understand the information required to meet the Standard. Enterprises that do not have the services of a water professional may not have the technical ability to manage the requirements of the Standard and thus may require the services of a consultant. This would likely be highly dependent on the information able to be provided by a catchment management authority.
- The enterprise would require the ability to source and understand the upstream indirect use information. Within the locale or region this may be relatively simple, for example for a milk factory dealing with its local milk suppliers. However, this may not be so simple if the milk factory was to look

at the suppliers of their packaging (cardboard, glass or plastic) or other elements of the supply chain (e.g. energy).

- In our view, such an enterprise should be able to meet the requirements of the Standard, where situated in a reasonably well governed catchment, so long as catchment monitoring systems are in place. As discussed above, in the absence of this, it is unlikely that even a significant water user would meet the requirements of the Standard without significant investments in catchment-level governance typically outside of its domain.

An enterprise that does not have a significant impact on upstream or downstream properties.

- It is unlikely that the enterprise would be able to offer evidence in support of compliance with Sections 4, 5 & 6 of the Standard, where significant involvement with the local catchment management body is required.
- The enterprise may also not be in a position to source and manage the required data or have the resources or technical ability to determine its upstream indirect catchment impacts.
- Where enterprises have little direct influence (e.g. in an urban area), much of the Standard becomes irrelevant, defaulting to “adopt a wetland” type outcomes. In such cases, the level of engagement required to meet the intent of the Standard is not defined. Further, it is unlikely that such an enterprise would be capable of achieving the level of reporting and engagement in relation to catchment-focused goals for either its direct or indirect areas of influence. Such an enterprise may benefit from a focus on more direct, i.e. on-site, indicators (improvements in water efficiency etc.).
- In our view, we would expect that it would be unlikely that many small enterprises would be able to demonstrate compliance with the Standard without significant support from an authority or a “Water Steward” (e.g. their key customer) that is willing to assist.

Water Steward Certification Program

The above issues lend themselves to a combined certification program where different enterprises take on different responsibilities, namely:

- An authority making available catchment-level information required for an enterprise to meet the Water Steward requirements;
- An enterprise with a significant water impact or significant exposure to water risk actively collaborating with the authority/ies to meet the requirements of the Standard, including taking ownership of catchment-focused goals for its indirect impacts (suppliers);
- Small enterprises with low individual water impacts meeting site level requirements and reporting to either the larger enterprise (its customer) or the authority;

Such a certification would require assessment of each of the entities, though it is likely that the small enterprises could be assessed using desktop/remote techniques, or at worst a “multi-site” sampling program; and

Although the trial of such an approach was performed by WSA, the draft Standard does not directly allow the certification process as suggested in the *Trial Supplier Certification Checklist* document. It is recommended that such an approach be further defined in an appendix or some other area of the Standard.

LRQA notes the following observations in relation to the field trial:

- The questionnaires sighted (Trial Supplier Certification Checklist – Sample 1 and Sample 2) would support the collection of upstream indirect catchment impacts for an enterprise sourcing farm-based products. One area that is not covered is the inclusion of Green Water. How would this be measured?;
- If the enterprise had other raw materials that might have significant upstream impacts, for example paper or cardboard packaging, cleaning chemicals, energy, it may be expected that information in relation to these indirect water users would be required;
- For the certification of a group supplier scheme, there may need to be auditor guidance as to the level of monitoring of the certified enterprise’s suppliers required to enable an acceptable level of confidence in the monitoring results.
- A standard format for site-level planning would assist the auditor. While not the domain of the Standard, it would be recommended that an enterprise requests information from its suppliers to assist in the development of a template that meets the Standard’s requirements. This would likely require assistance from the authority and/or other industry groups or government entities.

Other LRQA comments

As mentioned elsewhere, the Standard emphasises catchment-focused goals, and little direct measures of an enterprise’s site operations, or the sites within a multi-site enterprise (or those that are to be certified). Such measures, implemented through a management plan for water use and a continuous improvement process, include but are not limited to water efficiencies; recycling; collection and use of stormwater. The Standard could facilitate a more “outcomes-based” approach for enterprises with little direct influence on a catchment through recognition of such measures. This could potentially require a Part A and Part B of the Standard with clear guidance on the trigger for implementing the catchment-level requirements.

The field trial took place in the farming/food processing sector. Is it envisaged that this Standard would also apply in other sectors such as mining, power generation, heavy industry? If so, it would be useful to trial the Standard in other industries that might value certification:

- Mining;
- Coal seam gas extraction;
- Abattoirs;
- Tanneries;
- Powers stations using river water for cooling;

- Pulp and Paper manufacturers; and
- Primary metal processors, e.g., steelworks, aluminium.

The field trial included active engagement from the management authority and a medium-level enterprise. It would be instructive to contrast this with a significant enterprise in a catchment where catchment-level indicators are absent and engagement is less forthcoming. This would provide a robust test of the reasonable limits in which an enterprise could be expected to deliver catchment-level outcomes.

Stakeholder comment

Integration and simplification were the main themes in feedback provided by TMI, DA and the CMA. For all three, water stewardship is seen as part of a total package of either a sustainability program or natural resource management program. Hence, the Standard needs to be able to work seamlessly with other programs while still maintaining integrity and delivering meaningful outcomes on water-related issues.

Compliance costs continue to be a major concern and future development of the Standard and the related water stewardship system needs to look at a range of uses for a water stewardship program such as a self-assessment tool and an industry or catchment benchmarking program, for example.

Further development also needs to advance the Standard's ability to work with a range of stakeholders who would otherwise be in conflict over water, through guidance on issues such as stakeholder engagement. These issues will be addressed by WSA and AWS as well as DA, through ongoing development of its dairy sustainability program, and the CMA as it rolls out and implements its RCS.

Specific comments provided at the conclusion of the field trial are set out below.

Goulburn Broken Catchment Management Authority

The Goulburn Broken CMA has been involved in this Water Stewardship Australia field trial for the following reasons:

- Improved industry ownership of CMA programs and objectives through Standard conformance can result in alignment and acceleration of catchment programs and objectives;
- Conformance with the Standard demonstrates alignment with the Regional Catchment Strategy; providing confidence to potential investors in catchment management;
- Implementing the Standard can help develop potential links to other natural resource management (NRM) planning being undertaken in the catchment for example carbon sequestration, biodiversity, as well as land and water management (salinity, water quality, environmental water);
- Achieving conformance with the Standard will drive the next evolution and uptake of on-farm water use efficiency (recognising the public benefits from this drive);
- Conformance with the Standard can lead to improved community governance and engagement in catchment management;
- Acknowledgement of the CMA's programs and objectives as part of Standard conformance will help position the CMA as a credible industry partner, both locally and nationally (eg with MDBA);
- Implementation of the Standard can help simplify/demystify catchment processes for other industries (eg farmers); and
- The CMA can help industry partners use and implement the Standard.

We can see that implementing the Standard would have considerable NRM benefits for the region.

Dairy Australia

Many dairy companies are experiencing pressure from their customers to report on the sustainability of their products and supply chains. In this context, stewardship standards have emerged globally as an independent accreditation tool for environmentally sustainable and socially responsible primary production.

Dairy Australia on behalf of the industry sought to gain a better understanding of the practical cost and compliance impacts of a water stewardship standard at an early stage of its development, as it might apply to the dairy industry. The trial was also an opportunity to examine the performance of existing dairy sustainability assessment tools against a draft standard, and consider how any gaps might be addressed without increasing the cost or compliance burden for farmers and processors, or compromising the integrity of the standard.

Involvement in the development of an Australian Water Stewardship Standard at this early stage would ensure that the dairy industry is well-informed and well-prepared should this, or another water sustainability standard, be widely adopted. The trial findings will help to inform the development of targets and action plans in the dairy industry's sustainability framework, and a review of the Dairy Self Assessment Tool (DairySAT).

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