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Australia Committees

Predicting socioeconomic impacts of the proposed Basin Plan on Victoria

Final Report

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Executive Summary

REGIONAL SENSITIVITY TO IMPACTS

1. The Victorian Murray-Darling Basin includes (Figure ES 1):
   a. Sunraysia, which includes the old irrigation districts in the centres of Merbein, Mildura, Red Cliffs and Robinvale, and the private irrigation districts and communities surrounding those towns. Sunraysia is dominated by horticulture. Sunraysia’s social catchments also extend into NSW and SA;
   b. The Wimmera valley, which is usually a disconnected river system and which has recently seen the development of the Wimmera-Mallee pipeline. The holders of water entitlement in the Wimmera are seeking to sell it, in its entirety, to the Commonwealth, as they ceased irrigating during the drought;
   c. The Goulburn-Murray Irrigation District (GMID) and its communities which extend from Swan Hill in the west, take in dairy communities such as Kerang, Cohuna and Rochester, and extend to the west and south of Shepparton. Irrigated dairying is important across the GMID with a number of milk factories that are the principal employer in small towns. Shepparton is a diverse regional city surrounded by horticulture whose social catchment extends across northern Victoria into southern NSW. The GMID, which also has some connections to smaller valleys (Campaspe, Coliban, Loddon and Broken), is currently subject of a major modernisation program, NVIRP, which has recovered water from the environment and provides a more versatile water supply; and
   d. Other valleys with far smaller volumes of water used for irrigation (including the Kiewa and Ovens) and also water used for the Bendigo urban supply from the upper Campaspe and Coliban.

2. The MDBA has noted:¹

The Victorian Murray region is one of the major irrigated regions within the Basin, and hence highly sensitive to changes in water availability. Specialised irrigated horticulture (both permanent and annual), and the food processing that adds value to these products, is central to the regional economy—around 26 per cent of regional employment is in these two sectors. Other industries include food processing (e.g. wine and table grapes, dried fruit, juicing), dairy, and milk processing. A significant irrigation services industry provides on-going maintenance of systems, and contributes to the development and introduction of improved technology.

The southern Murray-Darling Basin includes the valleys of the Murrumbidgee, NSW Murray, Victorian Goulburn Murray Irrigation District, Sunraysia and the South Australian Riverland. These valleys have relatively greater irrigation water availability and use than other valleys, are hydrologically interconnected and are served by an interconnected water market. Water entitlements, and water allocations (i.e., ‘temporary’ water) are traded between these valleys such that they act in many ways like a single region.

Some small valleys within the southern Basin are not easily accessible for procurement of environmental water – for example, the Kiewa, Ovens, Loddon and Wimmera valleys have limited hydrological interconnectivity with the other, much larger valleys, and much less developed capacity for trade. This means that attempts to procure water from the southern Basin primarily will be felt in the large interconnected valleys.

Within the southern connected basin, a range of different entitlement types is available (and different language is used in each state to describe them). Generally speaking, the different entitlement types can be described as high (NSW, Vic and SA), medium (NSW general) and low (NSW supplementary and Vic low) reliability entitlements. Reliability (also called ‘security’) refers to the priority with which water is allocated against entitlements. More reliable entitlements are more likely to get a higher percentage of their potential water allocation in drier years.
6. A high level of reliability is important for farmers who need certainty of water supply in dry years to keep their farm enterprise viable. Accordingly, high reliability entitlements are preferred by dairy and horticulture. High reliability is proportionally more common in Victoria than in New South Wales. Conversely, medium reliability entitlements are preferred for rice farming systems, which use water opportunistically in wet years when it is relatively cheap and plentiful, and are more common in NSW. The low reliability entitlements (NSW and Vic) are now perceived to be of limited value.

7. The main irrigation farming sectors of the southern connected Basin are:
   b. Dairy – Goulburn Murray Irrigation District (with minor dairying in NSW Murray and SA Lower Lakes)
   c. Rice – southern NSW (NSW Murray and Murrumbidgee)
   d. Mixed farming (apart from rice) – Goulburn Murray Irrigation District, NSW.

8. These sectors have different ability to pay for water (horticulture has the greatest ability to pay, followed by dairy, rice and mixed farming – though this is a generalisation that is subject to impact from commodity prices). They also have different responses to wet and dry years; in dry years, mixed and rice farmers often tend to sell any allocations they may have from their medium reliability entitlements to dairy and horticulture farmers who need to care for plantings and herds and, in very dry years rice farmers generally have no allocations, and dairy farmers sell some of the small amounts they have to horticulture, to keep their plantings alive.

9. The net result of these different responses and needs is that across the southern interconnected Basin as a whole, in the long run an approximate equilibrium has been reached between sectors that is subject to climate, commodity prices and the dynamics of the water market. The Basin Plan will alter the dynamics of the water market (its size, water prices, and availability of water in dry years) and therefore will shock the system so that, in the long run, a different approximate equilibrium will be reached compared to that seen in the past.

THE POTENTIAL SCALE OF THE POLICY SHOCK

10. The Proposed Basin Plan sets out Sustainable Diversion Limits (SDLs) that would entail a 2,750 GL reduction in consumptive water use, almost entirely from irrigation. In the southern connected Basin, the proposed reduction in diversions totals 2,360 GL (including 23 GL for the Wimmera). By comparison, the 2010 Guide to the proposed Basin Plan proposed reductions of 2,352 GL (and none for the Wimmera).

11. The Guide set out an SDL for each valley. The Proposed Basin Plan sets out a smaller per-valley SDL, plus 971 GL to be sourced across the southern Basin as a whole. The Proposed Basin Plan also noted that significant water recovery has already occurred in some valleys. The Basin Plan effectively commenced implementation in 2007, when the Water Act 2007 (Cth) came into effect and the Water for the Future modernisation and buy-back programs commenced. For Victoria’s valleys, buy-back to date, combined with the very significant water savings from NVIRP (stages 1 and 2), mean that the within-valley targets for the Goulburn and the Murray have already been exceeded (Figure ES 2).

a. To date, 52 GL has already effectively been allocated to this 971 GL shared contribution via NVIRP, because the Victorian Goulburn and Murray have contributed
52 GL more than their in-valley reductions. This leaves 919 GL to be recovered for the shared contribution.

![Graph showing PBP in-valley reductions GL and Recovered so far (includes NVIRP 2)](image)

**Figure ES 2. Proposed in-valley reductions and recovery to date.**

12. The Proposed Basin Plan sets out an implementation process in three stages:

a. From now until 2015: recover water primarily through modernisation, works and measures (with general water buy-backs in the southern Basin effectively on hold until 2013);

b. A review in 2015 to determine whether the SDLs should be revised; and

c. Buy-back of any remaining ‘gap’ between 2015 and 2019, at which point the Basin Plan is to be fully in effect, with SDLs completely implemented.

13. The establishment of this process, coupled with the differentiation between in-valley reductions and the 971 GL requirement to meet the southern Basin SDL, means that the potential impacts on Victorian irrigation sectors and communities will face a cross-roads in 2015 depending upon what happens between now and 2015, (i.e., will the 971 GL be substantially met by buy-back, or will there be alternative ways found so that the remaining buy-back will be negligible?) and also on the extent to which high reliability compared with medium/low reliability entitlements then will be required for the portfolio of the Commonwealth Environmental Water Holder.

14. The question of environmental water portfolio needs is very important for Victoria. A stated objective of the Basin Plan is to keep the Murray mouth open in nine out of ten years on a long-term average.\(^4\) Such an objective could potentially require an entitlement portfolio with a large proportion of high reliability entitlements (i.e., entitlements that enjoy a high proportion of water allocation in dry years). If that was the case, Victoria – which holds some 67% of the high reliability entitlements in the southern Basin – could see

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\(^3\) source: RMCG analysis of the Proposed Basin Plan.

significant buy-back of these entitlements. Conversely, if the environmental portfolio is
mainly of medium reliability entitlements, buy-back would particularly affect rice-growing
communities in NSW.

15. While those farmers who sell would be compensated, the impacts on communities would
stem from third party impacts on farmers who remain (e.g. increased input and water
supply costs) and the value chain (e.g. less economic activity in food processing).

16. The high level of water recovery in Victoria to date, the 2015 process, and the ‘bookend’
scenarios for Victoria that arise from the uncertainty about environmental water needs,
are summarised in Figure ES 3. It is likely that the future will fall somewhere between the
two bookends. This scenario framework, using the three stages outlined above, is applied
to irrigation sectors and to communities in the following sections.

17. The bookend scenarios are:

a. At one extreme (the right side of the decision tree in Figure ES 3), the Basin Plan
requirements largely have already been met through the substantial water recovery to
date (Figure ES 2). This may be described as a ‘best case’ scenario, from the
perspective of third party impacts on communities. Although the impacts of buy-back
have not yet been felt (due to, first, drought and then due to very high rainfall), and
the impacts of modernisation also have not yet been fully felt as it is still in
implementation, those changes have already largely occurred; and

b. At the other extreme, to meet the 971 GL target for the southern Basin could entail
significant further water recovery from Victoria, with little remaining scope to recover

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*Figure ES 3. Bookend scenarios for Basin Plan impacts on Victorian communities.*

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5 source: RMCG analysis
that through modernisation. This may be described as a ‘worst case’ scenario, from the perspective of third party impacts on communities. A significant proportion of this would come from high reliability entitlements. Sellers would be mixed farmers, dairy farmers, and any horticulture growers who were struggling at the time of tender (e.g. due to low commodity prices, as in the wine grape sector). This would particularly impact the western GMID and the old irrigation districts of Sunraysia. The extent of this potential change is summarised in Figure ES 4, which shows that while around 15% of Victoria’s water entitlements have already been sold to the environment, this could increase to over 40% in the ‘worst case’ scenario on the left side of the framework in Figure ES 3.

Figure ES 4. Reduction in irrigation water use for Victoria’s Goulburn and Murray valleys: ‘worst case’ scenario.⁶

ADAPTIVE CAPACITY OF COMMUNITIES

18. In northern Victoria, adaptive capacity is relatively weakest in Merbein, Red Cliffs, and parts of western GMID. It is relatively higher in the eastern GMID including around Shepparton.⁷

19. Selected socioeconomic indicators for the Victorian Basin irrigation communities are shown in Table ES 1. As a generalisation, the lower the SEIFA score, the more people over 55 and Indigenous people, the lower the educational attainment, and the greater the relative role of agriculture in a local economy, the more vulnerable that community may be to loss of irrigated production.

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⁶ source: RMCG analysis. Assumes that Sunraysia’s share of the Victorian Murray buy-back is proportionate to its share of water (35% of the Victorian Murray) and 17% of the Victorian total (i.e., Goulburn plus Victorian Murray). Analysis is based on long term cap equivalents of entitlements, rather than total baseline diversions. Water savings from irrigation are not included, because they do not reduce the consumptive pool. Numbers are rounded.

Table ES 1. Selected socioeconomic indicators.\(^8\)

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<th>Area</th>
<th>SEIFA* 2006</th>
<th>Indigenous people 2006(^{10})</th>
<th>People 55+ 2010(^{11})</th>
<th>Population 2010(^{12})</th>
<th>2001 Age 15+ with qualification(^{13})</th>
<th>GVAP 2006-07 $million(^{14})</th>
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<tr>
<td>Shepparton</td>
<td>936</td>
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<td>28%</td>
<td>82,781</td>
<td>26%</td>
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<td>Kiewa</td>
<td>995</td>
<td>0.7%</td>
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<td>12,138</td>
<td>37%</td>
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<td>Myrtleford</td>
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<td>18,911</td>
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<td>Wangaratta</td>
<td>931</td>
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<td>Mildura</td>
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<td>$437.0(^{15})</td>
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<td>Echuca</td>
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<td>Kerang</td>
<td>922</td>
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<td>35%</td>
<td>14,889</td>
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<tr>
<td>Wimmera</td>
<td>945</td>
<td>1.4%</td>
<td>30%</td>
<td>14,699</td>
<td>29%</td>
<td>$234.3</td>
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<tr>
<td>Comparison(^{16})</td>
<td>1000</td>
<td>1% (All Victoria)</td>
<td>25% (All Victoria)</td>
<td>34.8% (All Victoria)</td>
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**IMPACT OF POLICY SHOCK**

20. These changes are occurring in a context that includes depleted financial, human and social capital as a consequence of drought; a recent collapse in wine grapes due to low commodity prices; the January 2011 floods; and on-going trends such as the drift of populations (particularly young people and those who are more employable) away from small country towns.

21. Over the past decade, in particular:

a. The irrigation districts of Sunraysia (principally Merbein, Mildura and Red Cliffs, not Robinvale) have seen significant drying-off of wine grape blocks, asset fixity and financial stress, while the private diversion areas outside these old districts are in a significantly better position; and

b. The GMID farms and communities, which are strongly linked to the dairy industry, have contracted in the west of the GMID. Milk production dropped during the drought

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\(^{8}\) Source: RMCG analysis of ABS data. Note that data is for Statistical Local Areas. Some changes to SLAs occur from year to year, and SLAs only approximately match social catchment boundaries.

\(^{9}\) Index of Relative Socio-economic Advantage and Disadvantage weighted by population. ABS, 2008, 2033.0.55.001 - Socio-economic Indexes for Areas (SEIFA), Data only, 2006.

\(^{10}\) ABS, 2008, Experimental Estimates of Aboriginal and Torres Strait Islander Australians, June 2006.

\(^{11}\) ABS, 2011, 3235.0 Population by Age and Sex, Regions of Australia, June 2010.

\(^{12}\) ABS, 2011, 3235.0 Population by Age and Sex, Regions of Australia, June 2010.


\(^{14}\) Note that GVAP data includes non-irrigated production ABS, 2008, Agricultural Commodities, 2006-07.

\(^{15}\) Data for Swan Hill (RC) – Central SLA was not available.
from 3 billion to 1.8 billion litres, however the GMID remains a significant provider of national milk production (20%) and signs of recovery are evident post-drought.

22. Impacts are briefly outlined below, and summarised in Table ES 2 and Table ES 3.

**IMPACTS OF BUY-BACKS AND MODERNISATION TO DATE**

23. Buy-backs to date have, despite their unpopularity, provided struggling farmers with an opportunity to free up capital and either survive the drought and commodity price fluctuations, or exit. The third party impacts largely have yet to be felt, because allocations were so low during the drought, and because – in the nearly two years since – allocations have been very high, with flooding occurring several times in some parts of the Victorian irrigation regions. Those impacts will become apparent in the future.

24. Modernisation has provided opportunities for some farmers to invest in on-farm efficiency that is showing signs of leading to increased value of production. It has also provided a stimulus to local economies due to construction expenditure. The cost of water supply by a modernised system is likely to be a challenge to those farmers who have a low value of production (that is, mixed farmers) but evidence of this is not yet generally apparent.

**IMPACTS IF FUTURE BUY-BACK IS LOW**

25. If future buy-back is low – that is, the ‘best case’ scenario outlined above – over the next few years the GMID will continue to recover from drought. It will not recover to pre-drought levels, because:

   a. Horticulture growers have changed their perception of the balance between the extent of plantings and the reliability of water, so at an industry scale, are unlikely to expand beyond about 35% of water use (on average); and

   b. Significant buy-back has occurred, which will reduce total production, primarily for dairy. If the dairy industry does not lift its productivity, production would stabilise around 1.8 billion litres – however productivity improvements are considered feasible sufficient to lift production to 2.5 billion litres a year.\(^\text{16}\)

26. This scenario (like the other scenario discussed below) would see significant local economic stimulus in the GMID while modernisation is being implemented.

27. Dairy is experiencing a slow but steady improvement in confidence, with a forecast 11% increase in milk production in 2010/2011. Farms are starting to see benefits of improved irrigation delivery and combined with on farm works increasing productivity, and the competitive advantages of the region would be expected to attract investment.

28. Under this scenario for the GMID, a long-term equilibrium would be characterised by improved utilisation and efficiencies of milk processing facilities, a dairy industry underpinning the longer-term viability of the irrigation delivery system, and maintenance of a critical mass supporting the large dairy service industry. Dairy would continue to be the mainstay of many small country towns throughout the GMID, although some towns, particularly in the west, may continue to see a slow decline, depending on the actions they take for their futures (and other circumstances).

29. In Sunraysia, this scenario would make it much harder for those growers who want to exit, with impacts on communities depending on commodity prices and the rate of

\(^{16}\) source: RMCG analysis for the dairy industry
restructuring of the old irrigation districts. These districts, which encircle Mildura and also face pressure from subdivision, feature blocks that are so small they usually are uneconomic on their own, and a mosaic of different ownership that makes consolidation very difficult. Under this scenario there is an increased likelihood of more abandoned blocks (especially the smaller properties within the irrigation districts) if there is insufficient confidence and capital, especially smaller properties in districts.

30. The potential restructure of the Sunraysia irrigation districts offers a prospect of on-going viability with larger blocks – targeted buy-back could assist exit in those areas. This would help the districts enjoy some of the competitive advantages of the private diversion areas that lie beyond the district boundaries.

31. In the long term, equilibrium for Sunraysia under this scenario would see market-driven restructure and districts becoming residential and/or significantly abandoned in some areas and abandoned, unless an effective restructure program is implemented. It could also see possible expansion in private diversion areas if market confidence returns.

32. For the other Victorian valleys, this scenario would see little change. The Wimmera would be able to sell its collective entitlement, which is currently a strongly shared aspiration. If that is delayed and rainfall continues to be good, this consensus would be likely to unravel as some farmers would want to return to irrigation; it is important that the sale of the Wimmera entitlements occurs soon.

IMPACTS IF FUTURE BUY-BACK IS HIGH

33. In the ‘worst case’ scenario, particularly in the period from 2015-2019, the GMID would see a stimulus from irrigation modernisation and significant cash flow from buy-back, followed by a sharp contractive adjustment, particularly if the stimulus were not invested in future productivity. The impacts would be most serious in the western part of the GMID which has lower adaptive capacity and less economic diversity, with a relatively very high dependence on dairy (and mixed farming). Figure ES1 shows the relative order of the reduced water in the GMID, where the worst case would see almost a third of the remaining water leave the region.

34. In the western GMID, the longer term equilibrium would see much less food (dairy) processing, fewer working families, cheaper houses and land attracting new residents of lower economic means, more social challenges and fewer resources to deal with those challenges.

35. In the eastern GMID, land within commutable distance of Shepparton would face sharply increased land use pressures, as lifestyle property demand lifts in response to the stimulus of buy-back and modernisation coupled with the drying off of irrigation farms. Farther away from Shepparton, the eastern GMID would see increased land transitioning to dryland farming with associated population loss, as dryland farming requires far fewer workers and processing capacity.

36. Sunraysia would, in this scenario, see a sharp decline in production and large scale drying off, especially in the old irrigation districts (except Robinvale). While this will make it easier for farmers who want to exit, it will see significant negative community impacts, particularly for Merbein. It would sharply exacerbate the existing land use planning pressures close to Mildura. There is a perception amongst many horticulturalists and associated processing/packing industries that horticulture is relatively immune to the potential reduction in total water available. Whilst this is generally true in average to wet seasons, the Basin Plan will put upward pressure on water prices in dry periods, and
exacerbate the impacts that horticulture felt in the recent drought, where temporary water prices contributed to tipping several notable farming businesses over the edge to bankruptcy.

37. For the other Victorian valleys, this scenario would see little change, with the same implications for the Wimmera as in the ‘best case’ scenario outlined above.

RESIDUAL VULNERABILITY

38. In the longer term, vulnerability post-Basin-Plan is likely to be greatest around Merbein and Red Cliffs, and the western GMID.

SCOPE OF POTENTIAL MITIGATION OPTIONS

39. There are a number of potential actions that could mitigate the impacts of the MDB Plan in Victoria. These include:

a. Reducing the extent of shock:
   i. Modernisation in other parts of the southern connected Basin to contribute towards the 971 GL required downstream (particularly NSW);
   ii. Works and measures to improve the efficiency of river operations and environmental watering;
   iii. Changes to the rules used to manage the water so that existing water can be used differently to better achieve environmental watering outcomes;
   iv. The CEWH trading water in dry years (it has indicated this probably will not occur in very dry years) to underpin the water market for horticulture and dairy;
   v. Where buy-back does occur, policy measures to leverage lower reliability entitlements (including those from Victoria) and targeted buy-back that takes account of costs and benefits at a holistic scale;

b. Improving adaptive capacity:
   i. Developing the human and social capital of people making key decisions that affect their future and the future of their community,
   ii. Ensuring appropriate access to physical and financial capital to give people options;
   iii. On-farm and system modernisation (including through NVIRP) to improve levels of service from the irrigation system on-farm; and
   iv. Farmers having capacity to access capital (e.g. through sale of water entitlement) to invest on their farms;

c. Mitigating impacts:
   i. Diversifying the economic base of communities where feasible – across northern Victoria a number of communities that are highly sensitive to potential irrigation reduction also have strong potential for diversification; and
   ii. Managing the process of adjustment for communities with very high residual vulnerability.
Table ES 2. Summary of potential impacts – farming sectors and processors

<table>
<thead>
<tr>
<th>Irrigation farming sector</th>
<th>Regions</th>
<th>Water needs</th>
<th>Last 5 years</th>
<th>Next ~5 years</th>
<th>‘Best case’ long-term</th>
<th>‘Worst case’ long-term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horticulture growers and processors</td>
<td>Sunraysia Western GMID (relatively less common) Eastern GMID (around Shepparton) Other valleys (relatively less common)</td>
<td>High reliability entitlements Need water in dry years to sustain perennial plantings</td>
<td>Wine grape prices low – significant adjustment</td>
<td>Ongoing wine grape adjustment</td>
<td>Little change except for structural adjustment challenges in older Sunraysia irrigation districts. Underlying trends to continue. Some increase in temporary water prices in dry years</td>
<td>Most change would occur in older Sunraysia irrigation districts (except Robinvale): sharp decline in production and large scale drying off. Significant increase in temporary water prices in dry years reducing water availability</td>
</tr>
<tr>
<td>Dairy farmers and milk processors</td>
<td>Eastern GMID Western GMID Other valleys (relatively less common)</td>
<td>High reliability entitlements Can buy in feed in dry years (cost issues)</td>
<td>Farmers developed more flexible systems including bought-in feed Debt increased by 41% during drought Farm rationalisation Closure, change in ownership some milk factories Stimulatory effect of NVIRP spending</td>
<td>NVIRP expenditure stimulus in GMID (complete 2018) Buy-back stimulus if 2015 Basin Plan review indicates significant further buy-back. Buy-back eases exit for individual farmers.</td>
<td>1.8 million litres (2.5 million with productivity improvements) Maintain critical mass of farmers and dairy factories Underlying trends (including farm consolidation) would continue. Individual businesses have options but overall industry would decline</td>
<td>1.3 million litres. Pass thresholds for sector leading to contraction, particularly west GMID. Remaining individual businesses would have options and be viable</td>
</tr>
<tr>
<td>Mixed farming (outputs include dairy fodder)</td>
<td>Eastern GMID Western GMID Other valleys (relatively less common)</td>
<td>Low reliability entitlements Sell water allocations (if any) in dry years</td>
<td>Reversion to dry land with reduced population and lots of restructuring; lifestyle properties particularly close to Shepparton</td>
<td>Increased dryland farming</td>
<td>Same trends apparent today will continue, and water charges (fixed delivery share charges) will be a significant impediment to mixed farming viability.</td>
<td>Much reduced mixed farming sector</td>
</tr>
</tbody>
</table>
Table ES 3. Summary of potential impacts - communities

<table>
<thead>
<tr>
<th>Region</th>
<th>Community</th>
<th>Vulnerability and exposure</th>
<th>Last 5 years</th>
<th>‘Best case’ no further significant buy-back</th>
<th>‘Worst case’ further significant buy-back</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunraysia</td>
<td>Mildura, Merbein and Red Cliffs</td>
<td>Highly vulnerable and exposed</td>
<td>Drying-off, adjustment driven by wine grape downturn and drought</td>
<td>Significant structural adjustment challenges as small blocks often not economically viable</td>
<td>Sharp decline in production and large scale drying off as growers sell entitlement.</td>
</tr>
<tr>
<td></td>
<td>Robinvale, private diverters</td>
<td>Low exposure, unlikely to sell water entitlement</td>
<td>Drought impacts</td>
<td>Recovery from drought. Little impact, unlikely to sell</td>
<td>Recovery from drought. Little impact, unlikely to sell water entitlement</td>
</tr>
<tr>
<td>Western GMID</td>
<td>Kerang, Echuca, west towards Swan Hill</td>
<td>Highly vulnerable and exposed</td>
<td>Contraction of farms, processors and communities because of drought</td>
<td>NVIRP stimulus to 2018. Very substantial farm restructuring into viable farms. Continuing trends of population drift to larger centres form small towns</td>
<td>NVIRP stimulus to 2018, plus buyback stimulus to 2019. Rapid and sharp adjustment, loss of confidence, much diminished farming and population loss</td>
</tr>
<tr>
<td>Eastern GMID</td>
<td>Shepparton and Goulburn valley</td>
<td>Moderately vulnerable and exposed</td>
<td>Some contraction due to drought</td>
<td>NVIRP stimulus to 2018. Recovery from drought</td>
<td>NVIRP stimulus to 2018, plus buyback stimulus to 2019. Pronounced contraction particularly &gt;50km from Shepparton. Closer to Shepparton, impacts will still occur but buffered by Shepparton’s economic diversity and demand for lifestyle/commuter properties.</td>
</tr>
<tr>
<td>Wimmera</td>
<td>Horsham</td>
<td>Neither vulnerable nor exposed; sale of entitlements is being actively sought by farmers, adjustment has already occurred</td>
<td>Irrigation has ceased together with Wimmera-Mallee Pipeline development</td>
<td>In-valley entitlement sales will benefit sellers, no negative community impact</td>
<td>In-valley entitlement sales will benefit sellers, no negative community impact</td>
</tr>
<tr>
<td>Bendigo</td>
<td>Bendigo</td>
<td>Low vulnerability and low exposure; will experience some impacts because of linkages to western GMID and rising water costs</td>
<td>Drought impacts</td>
<td>Little impact</td>
<td>Rural drift to Bendigo as western GMID towns contract, leading to demand for social services. Urban water supply costs may rise.</td>
</tr>
<tr>
<td>Ovens/Kiewa</td>
<td>Wangaratta, Kiewa, Myrtleford, Bright</td>
<td>Low vulnerability and low exposure. Unlikely to sell significant entitlement.</td>
<td>Drought impacts</td>
<td>Little impact</td>
<td>Little impact, unlikely to sell water entitlement</td>
</tr>
</tbody>
</table>
1 Background

1.1 This report

This report was commissioned by the Hume, Loddon-Mallee and Grampians Regional Development Australia Committees.

The purpose of this report is to summarise RMCG’s analysis of the likely impacts of the November 2011 Proposed Basin Plan on Victorian communities.

This report does not duplicate material provided to the RDA committees in September 2011, in the lead-up to the Proposed Basin Plan. RMCG prepared a report each for the Loddon-Mallee, Grampians and Hume RDAs that summarised impact predictions based on analysis of the 2010 Guide to the proposed Basin Plan. Those reports include useful background information on the irrigation communities of the Victorian parts of the Murray-Darling Basin, so the interested reader is referred to those reports for that background.

This report is loosely related to work that RMCG is undertaking at the same time for the Commonwealth Department of Regional Australia, Regional Development and Local Government (DRARDLG), which the RDA Committees are involved in; however, our work for the Commonwealth is primarily focused on economic diversification opportunities in response to the Basin Plan, and this report does not canvas those issues.

1.2 About the Basin Plan

Under the Water Act 2007 (Cth), the Murray-Darling Basin Authority is responsible for preparing a Basin Plan that will rebalance the relative allocation of water between consumptive use and the environment.18

The Basin Plan will entail reductions of water for irrigation, in favour of the environment. The revised volumes of water available for consumptive uses, including irrigation, will be called ‘sustainable diversion limits’ (SDLs).

The process of developing the Basin Plan to date has included the following steps:

- In 2010 the Commonwealth Government announced that it would use voluntary buy-backs and modernisation to 'bridge the gap' between the current diversions and the Sustainable Diversion Limit that would be developed for the Basin Plan, making a commitment to not pursue compulsory acquisition of water entitlements;
- The Guide to the proposed Basin Plan was published in October 2010. This was not a statutory instrument, but was intended to build understanding – but was poorly-received in many irrigation communities, and the MDBA has since moved away from supporting the proposals in the Guide; and

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18 Section 3(c), the Water Act 2007.
The Proposed Basin Plan was published in mid-November 2011. It is a statutory instrument that will trigger a statutory process leading to a final Basin Plan around 12 months (or more) later. The first part of that process is a consultation period that will end 16 April 2012.

The final Basin Plan, which must be submitted to the federal parliament, is likely to be produced late in 2012 (the date is not yet fixed).

Under the Water Act, the SDLs must be implemented by the States by 2019.

The Chair of the Murray-Darling Basin Authority has outlined the process that he hopes to implement between 2012 and 2019 to allow for an orderly and adaptive transition to the new limits.20 His proposal would see around half of the reduction agreed and mostly implemented by 2015, followed by a revision of the proposed SDLs to take into account the outcomes of work between now and 2015 to reduce the volumes needed to achieve appropriate environmental outcomes through:

- irrigation modernisation water efficiency gains;
- using local knowledge to maximise the efficiency of achieving environmental outcomes for local environmental assets (e.g. through works and measures); and
- reviewing all regulations and agreements currently in place that inhibit the efficient management of water in the Murray–Darling Basin and, where appropriate, working with the states to remove these regulations, as recommended by the Windsor Inquiry.21

The 2015 review has been incorporated into the proposed Basin Plan statutory instrument.

1.2.1 Proposed Basin Plan and related publications

In November 2011, the MDBA published a range of documents explaining the proposals, as well as a range of reports that it had commissioned and prepared as part of its deliberations. That included a number of documents that are relevant to this present report – i.e., pertaining to the impacts on communities. They have been reviewed (and some have been referenced) in the preparation of this report. They include:

- Murray-Darling Basin Authority, 2011, Proposed Basin Plan – a draft for consultation. Murray-Darling Basin Authority, Canberra (this is the statutory instrument);

• ABARES 2011, Modelling the economic effects of the Murray–Darling Basin Plan. ABARES report to client prepared for the Murray–Darling Basin Authority, Canberra, November;

Other relevant publications drawn on in this report include:
• Commonwealth Environmental Water Holder, 2011, Commonwealth Environmental Water – Trading Arrangements: Discussion Paper. 7 November; and

1.3 Proposed Basin Plan – Victoria

1.3.1 Overview

In Victoria, the majority of irrigation occurs in the Goulburn and Murray valleys (Figure 1-1), with the Murray split into two irrigation areas – the Sunraysia irrigation districts and private irrigation areas, around Mildura, and the upstream areas around north-central Victoria. North-central Victoria is serviced by the Goulburn-Murray Irrigation District which effectively is a single, interconnected supply system incorporating the Torrumbarry, Pyramid-Boort, Rochester, Central Goulburn, Shepparton and Murray Valley irrigation districts (in the Murray, Loddon, Goulburn, Campaspe and Broken valleys).

![Figure 1-1. Victorian baseline diversions.](image)

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22 Source: RMCG analysis of the proposed Basin Plan.
1.3.2 Within-valley water diversions

For Victoria, the proposed Basin Plan sets out SDLs that total a 650 GL reduction in-valley. This entails 20% of the Goulburn baseline diversions, 15% of the Victorian Murray baseline diversions, 18% (the entire remaining irrigation entitlement) of the Wimmera baseline diversions, a smaller amount for Campaspe and Loddon, and no change for the Kiewa, Ovens and Broken (Figure 1-2).

Figure 1-2. Proposed Basin Plan Victorian in-valley diversions as a percentage of baseline diversions.  

However, because of the Northern Victoria Irrigation Renewal Project (NVIRP) which has been recovering water that has been allocated to the environment, together with those buy-backs that have been undertaken to date by the Commonwealth in anticipation of the Basin Plan, more than 100% of the in-valley reductions for the Goulburn and the Victorian Murray have already been achieved or will be achieved once NVIRP stage 2 is complete (Figure 1-3).

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23 Source: RMCG analysis of the proposed Basin Plan.
1.3.3 Shared contributions across the southern connected Basin

The in-valley contributions set out in the preceding section are not the sum of Victoria’s obligations for water recovery under the Basin Plan.

A key difference between the 2010 Guide to the proposed Basin Plan, and the 2011 Proposed Basin Plan, is that the Guide set out an SDL for each valley, while the Proposed Basin Plan sets out a smaller per-valley SDL, plus a volume that is to be sourced across the southern Basin as a whole for watering of downstream environmental assets, including the Coorong and the Murray Mouth.

The southern Murray-Darling Basin includes the valleys of the Murrumbidgee, NSW Murray, Victorian Goulburn Murray Irrigation District, Sunraysia and the South Australian Riverland. These valleys have relatively greater irrigation water availability and use than other valleys, are hydrologically interconnected and are served by an interconnected water market. Water entitlements, and water allocations (i.e., ‘temporary’ water) are traded between these valleys such that they act in many ways like a single valley.

Some small valleys within the southern Basin are not easily accessible for procurement of environmental water – for example, the Kiewa, Ovens, Loddon and Wimmera valleys have limited hydrological interconnectivity with the other, much larger valleys, and much less developed capacity for trade. This means that attempts to procure water from the southern Basin primarily will be felt in the large interconnected valleys.

Within the southern connected basin, a range of different entitlement types is available (and different language is used in each state to describe them). Generally speaking, the different entitlement types can be described as high reliability, medium reliability (i.e., NSW general security) and low reliability (i.e., Victorian low and NSW supplementary) entitlements. Reliability (also called ‘security’) refers to the priority with which water is allocated against

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24 Source: RMCG analysis of the proposed Basin Plan.
entitlements. More reliable entitlements are more likely to get a higher percentage of their potential water allocation in drier years.

A high level of reliability is important for farmers who need certainty of water supply in dry years to keep their farm enterprise viable. Accordingly, high reliability entitlements are preferred by dairy and horticulture. High reliability is proportionally more common in Victoria than in New South Wales. Conversely, general reliability entitlements are preferred for rice farming systems, which use water opportunistically in wet years when it is relatively cheap and plentiful, and are more common in NSW. Low reliability also exists in Victoria and NSW, where it is owned across all farming sectors except horticulture, and is now considered to be of limited use for productive agriculture.

The main irrigation farming sectors of the southern connected Basin are:

- Horticulture – Victoria: Sunraysia, around Shepparton. NSW: Griffith. SA: Riverland
- Dairy – Goulburn Murray Irrigation District (with minor dairying in NSW Murray and SA Lower Lakes)
- Rice – southern NSW (NSW Murray and Murrumbidgee)
- Mixed farming (apart from rice) – Goulburn Murray Irrigation District, NSW.

These sectors have different ability to pay for water. Horticulture has the greatest ability to pay, followed by dairy, rice and mixed farming – though this is a generalisation that is subject to impact from commodity prices. They also have different responses to wet and dry years; in dry years, mixed and rice farmers often tend to sell any allocations they may have from their lower reliability entitlements to dairy and horticulture farmers who need to care for plantings and herds; in very dry years, the rice farmers generally have no allocations, and the dairy farmers sell their small allocations at relatively high prices to horticulture to enable them to keep plantings alive, while the dairy farmers use the income generated from that sale to purchase grain etc. as an alternative feed source for their herds.

The net result of these different responses and needs is that across the southern interconnected Basin as a whole, in the long run an approximate (i.e., dynamic) equilibrium has been reached between sectors that is subject to climate, commodity prices and the dynamics of the water market. The Basin Plan will alter the dynamics of the water market (its size, water prices, and availability of water in dry years) and therefore will shock the system so that, in the long run, a different approximate equilibrium will be reached compared to that seen in the past.

In total, across the southern connected Basin, the proposed Basin Plan and the Guide are quite similar. The proposed Basin Plan sets out Sustainable Diversion Limits (SDLs) that would entail a 2,750 GL reduction in consumptive water use (which would come almost entirely from irrigation). In the southern connected Basin, the proposed reduction in diversions totals 2,360 GL (including 23 GL for the Wimmera). By comparison, the 2010 *Guide to the proposed Basin Plan* proposed reductions of 2,352 GL (and none for the Wimmera).

The sum of the within-valley SDLs represents a total reduction of 1,389 GL, while the proposed shared contribution is 971 GL in the southern basin. To date, 52 GL has already effectively been allocated to this 971 GL shared contribution via NVIRP, because the
Victorian Goulburn and Murray have contributed 52 GL more than their in-valley reductions. This leaves 919 GL to be recovered for the shared contribution. By contrast NSW (201 GL) and SA (22 GL) have still to commit to projects to meet their in-valley contributions.

For Victoria, therefore, the extent of impacts (beyond those already in train or implemented through buy-back to date and modernisation) depends on how the remaining joint contribution requirement is shared.

1.3.4 How will the joint contribution be met?

To put the remaining 919 GL of the joint contribution in context, it is shown relative to the proposed Sustainable Diversion Limits (SDLs) of the major southern connected valleys in Figure 1-4. The remaining gap is about 13% of the southern connected SDL as a whole (with reference to the major connected valleys in Figure 1-4).

![Figure 1-4. Remaining joint contribution ‘gap’ compared to proposed southern Basin SDLs](image)

The Proposed Basin Plan sets out an implementation process in three stages:

- From now until 2015: recover water primarily through modernisation, works and measures (with general water buy-backs in the southern Basin effectively on hold until 2013);
- A review in 2015 to determine whether the SDLs should be revised; and
- Buy-back of any remaining ‘gap’ between 2015 and 2019, at which point the Basin Plan is to be fully in effect.

The establishment of this process, coupled with the differentiation between in-valley reductions and the remaining 919 GL requirement to meet the southern Basin SDL, means that the potential impacts on Victorian irrigation sectors and communities will face a crossroads in 2015 depending upon what happens between now and 2015, (i.e., will the 971 GL
be substantially met by buy-back, or will there be alternative ways found so that the remaining buy-back will be negligible?) and also on the extent to which high reliability compared with medium/low reliability entitlements then will be required for the portfolio of the Commonwealth Environmental Water Holder.

The question of environmental water portfolio needs is very important for Victoria. A stated objective of the Basin Plan is to keep the Murray mouth open in nine out of ten years on a long-term average. Such an objective could potentially require an entitlement portfolio with a large proportion of high reliability entitlements (i.e., entitlements that enjoy a high proportion of water allocation in dry years). If that was the case, Victoria – which holds nearly 70% of the high reliability entitlements in the southern Basin (Figure 1-5) – could see significant buy-back of these entitlements. Conversely, if the environmental portfolio were comprised mainly of medium (i.e., general security) reliability entitlements, buy-back would particularly affect rice-growing communities in NSW. If the buy-back purchased low reliability entitlements (i.e., Vic low or NSW supplementary) then the impact on production would be relatively minor.

![Figure 1-5. High reliability water entitlements in the southern connected Basin.](image)

In simple terms the joint contribution theoretically may be able to met by things other than buy-back such as rules changes, works and measures, better use of carry over etc. This would be the best outcome for the northern Victorian communities. Alternatively, it could be

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26 RMCG analysis. The numbers in this figure refer to entitlements, not long term cap equivalents.
met substantially by buy-back of Victorian high security water, reducing the available water in the GMID and Sunraysia areas by up to a further 30%.

In discussing these volumes, it is important also to note the possibility that buy-back from other valleys may be followed by subsequent trade from the key Victorian valleys—for example, if water entitlements are procured from the Murrumbidgee, Campaspe or Loddon (especially if they are procured at a higher price than subsequent market prices) farmers in those valleys may subsequently buy entitlement to recreate their holdings, and a key source, given market dynamics, would be Victoria.

1.3.5 The behaviour of the Commonwealth Environmental Water Holder

Once the Basin Plan is fully implemented (by 2019), the Commonwealth Environmental Water Holder (CEWH) will be the single largest holder of entitlement in the water market of the southern connected Basin. Its behaviour in the market is likely to fundamentally change market dynamics. As the CEWH is not an irrigator, and has different objectives and priorities to irrigators, its behaviour is likely to be very different than that of the irrigators who held its water entitlements in the past.

A detailed discussion of the likely behaviour of the CEWH is outside the scope of this paper, although it is discussed in the paper currently out for submissions from the CEWH. However, a key point to note is that the Water Act 2000 (Cth) provides authority for the trade of the CEWH’s water portfolio (allocations and entitlements) including the power to purchase, dispose of and otherwise deal in water and water access rights, water delivery rights or irrigation rights. Disposal of allocations and/or entitlements may occur if:

- these are not required to meet environmental objectives in a given water accounting period and cannot be carried over to the next accounting period; or
- the proceeds of the disposal are used to purchase other allocations and/or entitlements that improve the capacity of the portfolio to meet environmental objectives.

The CEWH is likely to carry water over and trade water in different ways than irrigators.

The CEWH also notes that, if the objective is to build capacity for future environmental needs, then trade, either purchase or sale of allocations, is unlikely in extremely dry and extremely wet periods (although trade would occur in other climatic conditions). This may mean a smaller allocation market in very dry periods than some farmers (e.g. horticulture growers) historically have relied upon.

The important outcome of the CEWH trading is that the irrigation sector will inevitably be utilising what is left after the CEWH has accessed what it needs for the environment. This means that the profile of entitlements available to irrigators and hence the mix of enterprises between rice, dairy and horticulture will be influenced by the CEWH trading behaviour.

Another important aspect of the way the CEWH manages its water is the way it interacts with the “other” environmental water, held by other entities (including the Victorian Environmental Water Holder). Many people do not realise that the “other” environmental

water is around 8,000 to 9,000 GL, which is about equal to existing diversions. The Proposed Basin Plan has concentrated on the “diverted” water and until recently has little to say about the “the other half” of the water. This “other half” to which the environment has access comprises “unregulated” water and water in “transition” i.e., the working river concept where water has multiple uses (e.g. achieving environmental watering objectives en route to a farmer). The CEWH has the opportunity to work with the river operation managers to modify the “rules” to increase the efficiency and effectiveness of the water it holds and also the way the other half of the water is utilised. This offers further potential for the environmental outcomes anticipated from the SDL joint reductions to be met without resorting to further buy-back.
2 Framework for evaluating impacts

The previous chapter explained that even though the in-valley obligations in the proposed Basin Plan have been met for the major irrigation regions of Victoria, there remains a very substantial ‘gap’ with regard to downstream joint contribution obligations (the remaining gap at time of writing is around 919 GL). This ‘gap’ will be recovered across the southern connected Basin as a whole so a substantial proportion could come from Victoria.

To the extent that the ‘gap’ is met by buying entitlements on the water market, those farmers who sell would be compensated. The impacts on communities would stem from third party impacts on farmers who remain (e.g. increased input and water supply costs) and the value chain (e.g. less economic activity in food processing). However, as outlined in the previous chapter, the Proposed Basin Plan sets out a process whereby between now and 2015 government will explore opportunities to minimise buy-back needed to address the gap. This will be done through exploring irrigation modernisation, works and measures, and rules changes.

The high level of water recovery in Victoria to date, the 2015 process, and the ‘bookend’ scenarios for Victoria that arise from the uncertainty about environmental water needs, are summarised in Figure 2-1.

Figure 2-1. Bookend scenarios for Basin Plan impacts on Victorian communities. ²⁸

²⁸ source: RMCG analysis
At one extreme (the right side of the decision tree in Figure 2-1), substantial further water may not come from Victorian consumptive use. This could happen if modernisation, changes in the way the river is operated, and works and measures effectively address the 919 GL gap; and it could be aided if any remaining gap is largely addressed through procurement of general/low security entitlements from New South Wales and/or Victoria. This may be described as a ‘best case’ scenario, from the perspective of third party impacts on Victorian communities (NSW and SA communities are outside the scope of this report). Although the impacts of buy-back have not yet been felt (due to, first, drought and then due to very high rainfall), and the impacts of modernisation also have not yet been fully felt as it is still in implementation, those changes have already largely occurred.

At the other extreme, to meet the shared contribution for the southern Basin could entail significant further water recovery from Victoria. There is little remaining scope to recover that through irrigation modernisation in this State. This may be described as a ‘worst case’ scenario, from the perspective of third party impacts on communities.

In this ‘worst case’ scenario, a significant proportion of water almost certainly would come from high reliability entitlements. This is because the MDBA has stated that one of its objectives for the Basin Plan is to keep the Murray flowing to the sea nine years out of ten, to flush salt from the system and water important sites in the Basin.\textsuperscript{29} In order to hold an environmental water portfolio that can meet this objective, given climatic variability, the Commonwealth Environmental Water Holder (CEWH) is expected to identify a need for a portfolio with substantial high reliability entitlements.\textsuperscript{30} It is possible that the use of carry over and the identification of different water requirements could modify that to some extent, however in recent times the Commonwealth has concentrated on buying high security entitlements, and also, carryover will be diminishing use during a dry sequence of several years. It is important to note that the government has not released information setting out exactly what that portfolio will need to be to meet the requirements of its future Environmental Watering Plan.

Under this ‘worst case’ scenario, sellers of water entitlements would be mixed farmers, dairy farmers, and any horticulture growers who were struggling at the time of tender (e.g. due to low commodity prices, as the wine grape sector has been recently). This would particularly impact the western GMID and the old irrigation districts of Sunraysia.

\textit{In other words, if the joint contribution water was to come predominantly from high security entitlements then, because of the hydrological and market interconnection of the southern Basin, the contribution ultimately could be in the order of 50-70\% from Victoria.}

It is likely that the future will fall somewhere between the two bookends in Figure 2-1. This scenario framework, using the three stages hinging upon the 2015 review, is applied to irrigation sectors and to communities in the following sections. The extent of this potential change is summarised in Figure 2-2.

\textsuperscript{29} Murray-Darling Basin Authority, 2011, \textit{Delivering A Healthy Working Basin About the draft Basin Plan}. Murray-Darling Basin Authority, Canberra.
\textsuperscript{30} The CEWH is also expected to use carryover, but this will be of diminishing use during a dry sequence of several years/
Figure 2-2. Reduction in irrigation water use for Victoria’s Goulburn and Murray valleys: ‘worst case’ scenario.\textsuperscript{31}

This is broadly consistent with recent modelling conducted by ABARES for the Murray-Darling Basin Authority (Figure 2-3). That modelling uses regions that are larger than the actual irrigation areas (e.g. the Lower Darling largely is not irrigated but is shown as facing the greatest reductions) and is highly susceptible to assumptions about commodity prices. In reviewing the ABARES modelling MDBA noted:\textsuperscript{32}

\textit{Given that it is impossible to predict commodity prices for when the Basin Plan will be implemented in 2019, it is not possible to definitively determine the relative impacts of the Basin Plan on different catchments. However, given current land use patterns, hydrological factors and market conditions a relatively small number of regions appear to generally be affected more than others—these being the Murrumbidgee, Murray, Goulburn–Broken, Lower Balonne and SA Riverland. [emphasis added]}

\textsuperscript{31} source: RMCG analysis. Assumes that Sunraysia’s share of the Victorian Murray buy-back is proportionate to its share of water (35% of the Victorian Murray) and 17% of the Victorian total (i.e., Goulburn plus Victorian Murray). Analysis is based on long term cap equivalents of entitlements, rather than total baseline diversions. Water savings from irrigation are not included, because they do not reduce the consumptive pool. Numbers are rounded.

Figure 2-3. ABARES modelling of SDL contributions required after modelled water trade, Basin Plan regions, 2006-12 commodity prices.\textsuperscript{33}

\textsuperscript{33} Figure 32 in MDBA, 2011, Socioeconomic analysis and the draft Basin Plan. Part A – Overview and analysis. November.
3 Communities

This chapter explores the scenarios set out in Figure 2-1 (page 11), where either minimum additional buy-back occurs after 2015 through to 2019, or – conversely – significant further buy-back is required to meet the shared contribution across the southern connected Basin. These scenarios specifically look at changes to date, medium term changes and the longer term.

3.1 Context

As noted in section 1.1, this report does not duplicate the information provided to the RDA Committees in reports prepared by RMCG in September 2011. Those reports included background information on the socioeconomic profiles of the Victorian communities that may be impacted by the Basin Plan. The reader is referred to those reports if further background information is required.

The communities of Victoria’s irrigation areas span a number of towns that can be organised into social catchments (Figure 3-1). For this report, it is useful to consider four groups of communities:

- The communities of Sunraysia, around Mildura;
- The communities of the Wimmera;
- The communities of the western GMID, including Kerang, Swan Hill, Pyramid Hill, Cohuna and Echuca;
- The communities of the eastern GMID, centred around Shepparton; and
- The communities of the Ovens and of the Kiewa valleys.

This report discusses impacts flowing into communities from changes to irrigated production; because of this, it should be noted that Swan Hill is effectively on the border between the western GMID and Sunraysia. Swan Hill will be affected by changes in either of these regions.
Figure 3.1. Victorian Murray-Darling Basin towns and social catchments. 34

Figure 3-1 categorises towns according to their dependence on agriculture. The towns of Sunraysia and the GMID are particularly dependent on irrigated agriculture. Smaller towns in the region (e.g. Robinvale, Swan Hill, Kerang, Boort, Cohuna, Pyramid Hill, Rochester, Stanhope, Tongala, Tatura, Kyabram, Numurkah, Nathalia and Cobram) that have a population less than about 10,000 people and more than about 15% of the workforce employed in agriculture or agricultural processing are especially vulnerable to potential losses of irrigated agricultural production.

In northern Victoria the exposure of the four major regional centres varies. Mildura is primarily reliant on irrigated agriculture, whereas Shepparton/Mooroopna is mainly reliant; Bendigo is partly (but much less) reliant; and Albury/Wodonga has little reliance on irrigated agriculture.

This is also borne out by the recent modelling conducted by ABARES for MDBA (Figure 3-2), although it is important to note modelling limitations (refer to the MDBA report\(^{35}\)) and also that the scale of ABS data means that vulnerability is averaged within each statistical local area which may obscure results.

![Relative vulnerability of Basin communities for a 2,800 GL water recovery scenario.\(^{36}\)](image)

The population across northern Victoria as a whole would be expected to decline (accelerating underlying trends, in those cases where decline is already underway) with significantly reduced water availability and production because:


\(^{36}\) Figure 35 in MDBA, 2011, Socioeconomic analysis and the draft Basin Plan. Part A – Overview and analysis. November.
- there is expected to be a loss of employment as farm numbers decline and former irrigated properties are aggregated into the remaining farming enterprises, as farmers seek to operate more area with less labour;

- many of the non-retirement age farmers selling into the buy-back would be expected to leave the region (most with families) as they will not be able to access suitable employment within the region;

- some retirement age farmers selling into the buy-back would be expected to also leave the region but some would remain. They would relocate to the larger centres with the services they require; and

- there would be expected to be a loss of employment in other sectors of the community corresponding to declining revenue and demand for services including, but not limited to irrigation corporations, food processing, transport, specialist agricultural and engineering services, schools, councils and local businesses.

This may mean continued drift of people into larger centres, including Shepparton, Bendigo and Melbourne.

Likewise, across northern Victoria, providers of farm supplies and of capital items (motor vehicles, farm equipment) would be expected to come under significant competitive pressure from similar businesses located in the regional centres. There is a growing tendency for the larger farm businesses to do more of their business in the larger centres where there is a greater availability of goods. In this environment, businesses in Shepparton may outcompete smaller businesses in regional towns.

3.2 Western GMID

3.2.1 Context

Echuca and Swan Hill are the major centres in the western part of the GMID, with Cohuna Kerang, Boort and Pyramid Hill comprising the smaller centres. The area generally has more extensive irrigation with a higher proportion of larger properties and areas of dryland and/or low intensive irrigation (i.e., autumn irrigated pastures and winter crops). The communities of the western GMID have low adaptive capacity and high sensitivity to change compared to many other Basin regions. There is little value-adding in the region, with the last remaining dairy processing factory at Leitchville closing in recent times. Therefore almost all of the production is transported out of the region (e.g., dairy to the eastern GMID).

Bendigo serves this area, particularly for tertiary education and health services, but is only partly dependent on the area for its prosperity.

Key socioeconomic indicators for the region are shown in Table 3-1.
Table 3-1. Selected socioeconomic indicators: West GMID.\(^{37}\)

<table>
<thead>
<tr>
<th></th>
<th>SEIFA (^{28}) 2006</th>
<th>Indigenous people (^{39}) 2006</th>
<th>People 55+ 2010(^{40})</th>
<th>Population 2010(^{41})</th>
<th>2001 Age 15+ with qualification(^{42})</th>
<th>GVAP 2006-07 $million(^{43})</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>West GMID</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Echuca</td>
<td>934</td>
<td>1.7%</td>
<td>29%</td>
<td>66,745</td>
<td>29%</td>
<td>$450.5</td>
</tr>
<tr>
<td>Kerang</td>
<td>922</td>
<td>1.3%</td>
<td>35%</td>
<td>14,889</td>
<td>25%</td>
<td>$357.6</td>
</tr>
<tr>
<td><strong>Comparison</strong></td>
<td>1000 (Australian average)</td>
<td>1% (All Victoria)</td>
<td>25% (All Victoria)</td>
<td>34.8% (All Victoria)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Over the past five years, dairy and mixed farming have experienced serious negative impacts of drought (and, in 2011, floods) leading to loss of human, social and financial capital in this area. This has contributed to a contraction of farming, and accelerated emigration from small farming-based communities in the western GMID (Figure 3-3), although major towns (such as Swan Hill) grew.

![Figure 3-3. Population change in western GMID statistical local areas, excluding major towns.](image)

\(^{37}\) Source: RMCG analysis of ABS data. Note that data is for Statistical Local Areas. Some changes to SLAs occur from year to year, and SLAs only approximately match social catchment boundaries.

\(^{38}\) Index of Relative Socio-economic Advantage and Disadvantage weighted by population. ABS, 2008, 2033.0.55.001 - Socio-economic Indexes for Areas (SEIFA), Data only, 2006


\(^{40}\) ABS, 2011, 3235.0 Population by Age and Sex, Regions of Australia, June 2010.

\(^{41}\) ABS, 2011, 3235.0 Population by Age and Sex, Regions of Australia, June 2010.


\(^{43}\) Note that GVAP data includes non-irrigated production ABS, 2008, Agricultural Commodities, 2006-07.
Farming in the western GMID is primarily dairy and mixed farming. Farm sizes have been increasing over recent years, in line with trends across the agriculture sectors. There is some horticulture in the western GMID including perennial crops (stone fruit/olives) and annual crops (tomatoes/vegetables).

The injection of funds from NVIRP and on-farm modernisation along with the buy-back to date (which has been higher in the Western GMID) have resulted in a number of impacts in recent years. The construction stimulus has offset the drought, floods, low dairy prices and the inevitable rationalisation of farms and kept some economic stability to the region. In addition NVIRP has catalysed the start of considerable farm rationalisation and restructuring. A large number of properties have been purchased by corporate investments such as Kilter (using state superannuation funds)

The region has some of the significant environmental sites that are the beneficiaries of the MDB plan – sites such as the Koondrook Forest, the Kerang Lakes and the Marshes. To date environmental benefits to these sites have not flown through to have not seen substantive direct community socioeconomic benefits.

3.2.2 Minimum buy-back scenario

Figure 2-1 set out a scenario framework where, if significant additional water did not come out of Victoria, over the period from now to 2019 farming would recover from drought and NVIRP stage 2 would be implemented.

The period through to about 2019 for the western GMID would, in this scenario, see recovery from drought; but not to pre-drought levels, because dairy and mixed farming has sold some entitlement already to the Commonwealth. The impact of these entitlement sales has not yet been fully felt in the region (apart from the revenue to those who sold) because during the drought, allocations were so low as to swamp buy-back impacts, and in the past 18 months to two years, allocations have been so high (to the extent of flooding at times).

Over that time period and beyond, western GMID communities will need to adjust to these new economic realities and consolidate their economic position. Existing pressures, such as the high Australian dollar, fluctuations in commodity prices, decline of small and isolated regional areas etc. will continue to pose challenges to the communities of the western GMID.

In the longer term, this scenario does have opportunities for western GMID communities to stabilise and even, potentially, to grow, if they can adapt effectively to change.

In this scenario the most significant impact will be the continued restructuring of farm properties (consolidation and improved farm irrigation practices). Whilst overall production will decline because of the buy-back to date, there will be substantial offset benefits from this restructuring. The farms that do remain will be left in a greatly improved position. The one question mark that hangs over this region is the cost of water delivery from the G-MW system following NVIRP. This region is likely to be capable of using water opportunistically and this will depend on the cost of water delivery – this is still to be determined.

Generally this region will see very substantial farm restructuring into viable farms. In the short term the region will have a significant construction stimulus from NVIRP and farm works, but in the longer term there will be significant reduction in population.
Recent local evidence would suggest that there are two separate responses happening – George Warne (CEO of NVIRP) recently toured the region and commented on the abandoned irrigation areas and the extensive buy-back and reduced water use.\(^{44}\) Phil Price (Price Merritt Consulting), an irrigation designer, advises that he has more “whole farm plans” on his books than ever in his 30 years of business at Kerang,\(^{45}\) indicating substantial farm investment in the next few years.

### 3.2.3 Maximum buy-back scenario

In the Figure 2-1 framework, in the scenario where significant additional water did come out of Victoria, the communities western GMID would be particularly negatively impacted. Dairy and mixed farming are more marginal in the west of the GMID than in the east, so this part of the Victorian Basin would be disproportionately more likely to sell entitlement than the other parts of Victoria. Horticulture would be less likely to sell, although this will depend on individual business decisions.

The economic base for a number of dairy and mixed farming-based towns in the western GMID could be seriously undermined if significant further water (i.e., high reliability water) comes from Victoria. This could see, in some towns, some working families moving away, land values declining, and housing taken up by people on low incomes, with disproportionately higher need for social support services. If this was to occur, councils could face increased demand for services at the same time their revenue base contracts.

In the maximum buy-back scenario, the total remaining buy-back would be conducted from 2015 through to 2019. This would be a relatively rapid adjustment period, during which people would need to make important decisions about their businesses and families. It could be a difficult time for many communities and would benefit from outside support.

In the longer term, under this scenario, a much-diminished dairy and mixed farming industry would operate in the western GMID.

In the minimum buy-back scenario above, it was noted that there appear to be two trends operating in the region at present – abandonment of irrigation by some farmers, and significant investment in irrigation by others. In the maximum buy-back scenario, while the NVIRP investment on on-farm works would continue, the trend of abandonment of irrigation would be expected to be entrenched and exacerbated. This could easily undermine confidence and work against the objectives of modernisation. The future of irrigation in this area would depend upon G-MW’s ability to deliver water at an affordable cost, given reduced delivery volumes, particularly in this part of the region.

### 3.3 Eastern GMID

#### 3.3.1 Context

The Eastern GMID is centred around Shepparton, and comprises a number of smaller towns i.e., Cobram, Numurkah, Nathalia Stanhope Tatura, Kyabram and Rochester, with Echuca close by in the western GMID. Regionally, its future is strongly linked to the future of the

---

\(^{44}\) Pers comm. George Warne, January 2012  
\(^{45}\) Pers comm. Phil Price, January 2012
dairy sector, which is the biggest user of water and provides the major input to the economies of a number of small towns. Horticulture also is important in the western GMID, and has been gradually reinventing itself from an historically canned fruit export industry to a wider industry mainly for the domestic market.

Key socioeconomic indicators for the region are shown in Table 3-2.

Table 3-2. Selected socioeconomic indicators: East GMID.\(^46\)

<table>
<thead>
<tr>
<th></th>
<th>SEIFA(^{47}) 2006</th>
<th>Indigenous people (^{48}) 2006</th>
<th>People 55+ 2010(^49)</th>
<th>Population 2010(^{50})</th>
<th>2001 Age 15+ with qualification(^{51})</th>
<th>GVAP (^{06}-07) $million(^{52})</th>
</tr>
</thead>
<tbody>
<tr>
<td>East GMID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shepparton</td>
<td>936</td>
<td>3.0%</td>
<td>28%</td>
<td>82,781</td>
<td>26%</td>
<td>$771.6</td>
</tr>
<tr>
<td>Comparison</td>
<td>1000 (Australia(^\text{an average}))</td>
<td>1% (All Victoria)</td>
<td>25% (All Victoria)</td>
<td>34.8% (All Victoria)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A key part of the region is the value-adding undertaken for the dairy industry and the horticulture industry. It is this value-adding that distinguishes this part of the region from the western part. However, the area also has a significant proportion of small properties resulting from soldier settlement dairy/horticulture areas. These small properties are being restructured particularly with the injection of funds from NVIRP, farm modernisation and buy-back.

To date the Basin Plan has been a catalyst for restructure in that the buy-back (less concentrated than in the western GMID) has provided opportunities for those who wanted to exit, particularly those small dairy farms affected by the drought. NVIRP and farm modernisation have seen significant investment in the region. Farm restructuring, whilst significant, is not as extensive as is happening in the west.

The other aspect for the Shepparton region is the large number of lifestyle properties close to the main towns, particularly Shepparton. These lifestyle properties often provide an exit for the small unviable farms.

3.3.2 Minimum buy-back scenario

In the minimum buy-back scenario set out in Figure 2-1, over the period to about 2019 while the Basin Plan is being implemented, the eastern GMID would see a recovery from drought, together with an economic stimulus from the major $2 billion investment of NVIRP. There is an opportunity for these communities to capitalise on the economic stimulus of NVIRP, and the associated opportunity to increase the profitability and value-adding of farming.

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\(^{46}\) Source: RMCG analysis of ABS data. Note that data is for Statistical Local Areas. Some changes to SLAs occur from year to year, and SLAs only approximately match social catchment boundaries.

\(^{47}\) Index of Relative Socio-economic Advantage and Disadvantage weighted by population. ABS, 2008, 2033.0.55.001 - Socio-economic Indexes for Areas (SEIFA), Data only, 2006


\(^{49}\) ABS, 2011, 3235.0 Population by Age and Sex, Regions of Australia, June 2010.

\(^{50}\) ABS, 2011, 3235.0 Population by Age and Sex, Regions of Australia, June 2010.


\(^{52}\) Note that GVAP data includes non-irrigated production ABS, 2008, Agricultural Commodities, 2006-07.
In the longer term, the eastern GMID will settle into a new dynamic equilibrium where it has recovered from drought.

Without any more buy-back, the impact of the Basin Plan potentially may be positive, with communities seeing an injection of funds in the next 5 or so years, a viable dairy industry and consolidation of the value-adding factories. The future of the horticulture industries is less clear, however this is not related to the Basin Plan per se but rather to whether they can keep reinventing themselves to reflect changing market demands.

3.3.3 Maximum buy-back scenario

The economic stimulus from NVIRP will also be a factor in the maximum buy-back scenario. If significant additional water is bought out of Victoria after 2015, this will also provide an initial economic stimulus courtesy of revenue from water sales. Buy-back will also increase the exit of farmers from horticulture and, particularly, dairy and mixed farming, and a greater relative importance of dryland farming, which will offer much lower economic benefit and employment for the region.

In the longer term, when buy-back and the NVIRP construction process end, the economic stimulus will cease.

The worst case scenario of extensive buy-back would see a substantial reduction in the farm numbers in the area – akin to what has happened in the west GMID. There would also be substantial reduction in the processing industry. All of this would see a reduction in population, particularly in the areas outside of Shepparton.

Shepparton is less vulnerable than many other towns in northern Victorian irrigation areas because it has a large population and alternative industries (health, education, retail) that draw from an estimated social catchment population base of around 160,000 people. Shepparton is well-placed to remain competitive compared to other regional cities and towns in the southern Basin, because of its economic diversity and because of the irrigation system improvements from NVIRP.

However, irrigated agriculture has been the foundation that has attracted people and investment to Shepparton in the past. Agricultural supply industries and food processing still remain very important to the community and therefore it is still vulnerable to reductions in irrigated agriculture. It would also experience social impacts, and an inflow of people, as a result of the potential decline of some of the towns that look to Shepparton as their regional centre.

Townships in close proximity to Shepparton also benefit from some of the buffering that Shepparton would have in the face of reduced water availability. Townships within a radius of approximately 50 km provide people with the attraction of living in a smaller community, with a lower cost of housing and the benefit of employment opportunities in the larger centre.

Within commutable distance of Shepparton, former irrigated farming land will be increasingly taken up for rural lifestyle living and those farmers who remain will face increasing tension with other land users.

Medium sized communities such as Tatura are vulnerable to declining agricultural activity but they also have some buffering capability.
Smaller communities farther from Shepparton City are more vulnerable as there are limited alternatives that can replace the employment and economic activity generated by irrigated agriculture. Farther away from Shepparton, this scenario would see increased expansion of dryland farming at the expense of irrigation farming, and associated loss of population in response to diminishing economic opportunities in small irrigation-dependent towns.

3.4 Sunraysia

Sunraysia includes the older irrigation districts of Merbein, Mildura, Red Cliffs and Robinvale, serviced by Lower Murray Water. These small irrigation blocks encircle the townships which are culturally, socially and economically closely-linked to irrigation farming. Outside the irrigation districts, private diverters operate much larger-scale and, generally, more profitable irrigation farms. Irrigation in Sunraysia is overwhelmingly horticulture, as discussed in section 4.2. About 80% of the farm business numbers are located in the “old irrigation districts” but produce only about 20% of the regions production.

Key socioeconomic indicators for the region are shown in Table 3-3.

<table>
<thead>
<tr>
<th></th>
<th>SEIFA&lt;sup&gt;55&lt;/sup&gt; 2006</th>
<th>Indigenous people 2006&lt;sup&gt;55&lt;/sup&gt;</th>
<th>People 55+ 2010&lt;sup&gt;56&lt;/sup&gt;</th>
<th>Population 2010&lt;sup&gt;57&lt;/sup&gt;</th>
<th>2001 Age 15+ with qualification&lt;sup&gt;58&lt;/sup&gt;</th>
<th>GVAP 2006-07 $million&lt;sup&gt;59&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sunraysia</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mildura</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$470.6</td>
</tr>
<tr>
<td>Robinvale/Swan Hill</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$437.0</td>
</tr>
<tr>
<td>Com-parison</td>
<td>1000 (Australian average)</td>
<td>1% (All Victoria)</td>
<td>25% (All Victoria)</td>
<td>34.8% (All Victoria)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Some 90% of the farm businesses in the Mildura older irrigation districts are less than 10 hectares, but contributed only around half of the gross value of irrigated production for the districts. The small size of the majority of farms undermines their economic viability, as achieving economies of scale has been clearly demonstrated as an important business strategy for Mildura.<sup>61</sup> At present, significant parts of the districts have been dried off because of drought and because of very low wine grape prices in recent years. The map of Merbein in Figure 3-4, showing the extent of drying off, is illustrative of the diminished financial, physical and social capital of some of these communities at present.

<sup>53</sup> Source: RMCG analysis of ABS data. Note that data is for Statistical Local Areas. Some changes to SLAs occur from year to year, and SLAs only approximately match social catchment boundaries.

<sup>54</sup> Index of Relative Socio-economic Advantage and Disadvantage weighted by population. ABS, 2008, 2033.0.55.001 - Socio-economic Indexes for Areas (SEIFA), Data only, 2006.

<sup>55</sup> ABS, 2008, Experimental Estimates of Aboriginal and Torres Strait Islander Australians, June 2006.

<sup>56</sup> ABS, 2011, 3235.0 Population by Age and Sex, Regions of Australia, June 2010.

<sup>57</sup> ABS, 2011, 3235.0 Population by Age and Sex, Regions of Australia, June 2010.


<sup>59</sup> Note that GVAP data includes non-irrigated production ABS, 2008, Agricultural Commodities, 2006-07.

<sup>60</sup> Data for Swan Hill (RC) – Central SLA was not available

<sup>61</sup> ABARE, 2007, Sustainable enterprises for horticultural properties. Report for the Mildura Horticultural Task Force
The area saw a rapid expansion at the most recent turn of the century as the wine grape industry developed and water was traded from the GMID (particularly around Kerang) to this area. The recent drop in wine prices has precipitated a downturn to the area. The loss of revenue due to the wine grape slump and the drought was offset for some growers by the opportunity to sell entitlements to the Commonwealth. However, unlike in the GMID, Sunraysia has not yet seen a major, systematic irrigation system or on-farm modernisation program.

The Victorian and Commonwealth governments have been working for several years on a project to invest in the irrigation systems of Sunraysia. At the moment there is still no agreement on the infrastructure package to assist the older irrigation districts, although a ~$100 million project is being developed. This project would not assist the majority of the area’s production (i.e., private diverters). There is at present no proposal for a systematic on-farm modernisation program for Sunraysia.

Figure 3-4. Areas not irrigated in Merbein in 2011.\textsuperscript{62}

3.4.1 Minimum buy-back scenario

In the older irrigation areas of Merbein, Mildura and Red Cliffs, it is likely that a significant proportion of farmers will wish to exit between now and 2019 (although this is not likely to be

\textsuperscript{62} source: Mallee CMA and SunRise 21, 2011, \textit{Irrigation Status Report 2011}
the case in Robinvale which is on a sounder economic footing). In the minimum buy-back scenario outlined in Figure 2-1, those farmers will find it harder to sell entitlements and exit than when buy-back was active, because there will be relatively less market demand for entitlements and therefore lower prices. Because of the poor underlying economic state of many of the district farmers, this could lead to an increase in the incidence of abandoned blocks, particularly the smaller blocks, if confidence and access to capital are low. Merbein and Red Cliffs are vulnerable communities, and a continuation of the problems being faced by farming immediately adjacent to the towns would be a poor outcome.

However, if the districts can be restructured, so that block sizes effectively increase and water supply is fit for purpose for high value crops, this scenario offers a prospect of ongoing viability for the older irrigation areas around Mildura, which would benefit the small towns. A targeted buy-back could assist the adjustment process in this case.

In the longer term beyond 2019, the older districts may become residential in some areas and abandoned to farming unless they can be restructured.

In Robinvale, and in the private diversion areas, the minimum buy-back scenario would see recovery from drought and adjustment to a new equilibrium. This may see expansion in the private diversion areas if market confidence returns – although it is important to note that like all farming commodities, horticulture will respond to global market pressures. The water market will be changed by the advent of the Commonwealth Environmental Water Holder (discussed in 1.3.5).

Generally the region would see little further change resulting from the Basin Plan unless the proposed $100 million infrastructure project eventuates. This would provide a construction stimulus and trigger a degree of restructuring. If the wine industry decline continues, there will not be as much opportunity for exiting as the price of water rights will be lower, given the Commonwealth would not be highly active in the water market under this scenario.

3.4.2 Maximum buy-back scenario

The maximum buy-back scenario would see a sharp decline in production, and large-scale drying off, in the older irrigation districts around Mildura. It is likely that, given the underlying challenges faced by farmers in Merbein, Mildura and Red Cliffs, many farmers in these districts would sell their water entitlements to the Commonwealth. This would make it easier for those farmers to exit, but would lead to very significant negative impacts on communities, particularly Merbein, as economic activity is lost. Problems already faced within these communities – such as land use planning pressures, and relatively high unemployment and disadvantage – would be sharply exacerbated. Furthermore, the irrigation districts around Mildura would struggle to remain viable.

Conversely, farmers in the Robinvale district and the private diversion areas largely would not be expected to sell, so the impacts on Robinvale and the outer areas would derive from the impacts on their local towns.

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64 Jeanette Pope, 2011, Change and disadvantage in regional Victoria: an overview. Department of Planning and Community Development, May 2011
Maximum buy-back would mean less water available to agriculture, particularly in the extreme dry times, which would limit total horticulture development throughout the southern basin. The extent of this impact on Sunraysia would depend upon its relative ability to compete with the Riverland and Griffith regions. It is likely that all three regions would be similarly exposed to a likelihood of growers selling entitlement.

3.5 Other valleys

Throughout the northern Victorian irrigation regions are a number of small valleys such as:

- the Wimmera Irrigation Area, This area has not had any irrigation water for most of the last decade, and as a group have decided to apply to sell all the entitlement to the environment. Negotiations are continuing;
- the dairying and other niche activities in the Kiewa Valley and upper Murray;
- the wine, niche, dairy etc. activities in the Ovens valley. This valley historically had significant tobacco enterprises which have restructured in recent years;
- the apple, wine and lifestyle activities in the upper Campaspe valley The farmers in the main dairying area in the lower Campaspe valley have already elected to sell their water to the environment and dismantle the delivery system;
- the grazing, lucerne and niche activities in the upper Loddon; and
- some irrigation pumped direct from the mid Goulburn river around Seymour.

Key socioeconomic indicators for the region are shown in Table 3-4.

Table 3-4. Selected socioeconomic indicators: other valleys.65

<table>
<thead>
<tr>
<th></th>
<th>SEIFA&lt;sup&gt;66&lt;/sup&gt; 2006</th>
<th>Indigenous people 2006&lt;sup&gt;67&lt;/sup&gt;</th>
<th>People 55+ 2010&lt;sup&gt;68&lt;/sup&gt;</th>
<th>Population 2010&lt;sup&gt;69&lt;/sup&gt;</th>
<th>2001 Age 15+ with qualification&lt;sup&gt;70&lt;/sup&gt;</th>
<th>GVAP 2006-07 $million&lt;sup&gt;71&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ovens/Kiewa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kiewa</td>
<td>995</td>
<td>0.7%</td>
<td>30%</td>
<td>12,138</td>
<td>37%</td>
<td>$47.6</td>
</tr>
<tr>
<td>Myrtleford</td>
<td>958</td>
<td>0.4%</td>
<td>35%</td>
<td>18,911</td>
<td>39%</td>
<td>$140.9</td>
</tr>
<tr>
<td>Wangaratta</td>
<td>931</td>
<td>1.2%</td>
<td>28%</td>
<td>17,752</td>
<td>29%</td>
<td>$0.7</td>
</tr>
<tr>
<td>Wimmera</td>
<td>945</td>
<td>1.4%</td>
<td>30%</td>
<td>14,699</td>
<td>29%</td>
<td>$234.3</td>
</tr>
<tr>
<td>Comparison</td>
<td>1000</td>
<td>1% (All Victoria)</td>
<td>25% (All Victoria)</td>
<td>34.8% (All Victoria)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

65 Source: RMCG analysis of ABS data. Note that data is for Statistical Local Areas. Some changes to SLAs occur from year to year, and SLAs only approximately match social catchment boundaries.
66 Index of Relative Socio-economic Advantage and Disadvantage weighted by population. ABS, 2008, 2033.0.55.001 - Socio-economic Indexes for Areas (SEIFA), Data only, 2006
71 Note that GVAP data includes non-irrigated production ABS, 2008, Agricultural Commodities, 2006-07.
The Wimmera Irrigation Area and lower Campaspe Irrigation Area have seen major changes in recent years, but primarily these have been due to the drought and the Plan buy-back provides a restructuring response to this. For Campaspe, this has provided some stability to enable a graceful exit but has ultimately reduced the production from the region compared to pre drought. For Wimmera, it will finalise adjustment that largely has already occurred.

The apple (Harcourt) and the lifestyle irrigation around Bendigo is about to be restructured in order to both reflect the changing demographics and also to save water.

Bendigo is limited in its water and because of the drought constructed a pipeline (along with Ballarat) to access water from the Goulburn system. Supplies of water to Bendigo therefore are intrinsically linked to the southern connected basin. However Bendigo urban supply is always going to be able to access water, with much greater ability to pay than irrigation farmers. The effect of the Basin Plan will be to influence where this is sourced, its cost, and the funding available for the modernisation of the small irrigation scheme.

The remaining small valleys generally will be expected to see little Basin Plan-related change as the volumes are small, trade sometimes is limited and the benefit of retaining entitlement is likely to be greater for farmers than the benefit of selling it. Many of the users are either lifestyler or high value niche farmers that will always be able to fund the required water regardless of what happens elsewhere. To date these valleys have seen very little trade, although as the water market matures and trade is made easier trade may become a bit more developed.

All of these areas need high security water, i.e., water in dry times so that farmers can be confident to develop new enterprises. The Basin Plan is likely to create some uncertainty among these groups, so may dampen investment slightly until the 2015 review.
4 Farming sectors

This chapter explores the scenarios set out in Figure 2-1 (page 11), where either minimum additional buy-back occurs after 2015 through to 2019, or – conversely – significant further buy-back is required to meet the shared contribution across the southern connected Basin.

4.1 Dairy

4.1.1 Context

The Murray Dairy region (north east Victoria and southern Riverina, including many major rural cities and towns) is the largest milk producing area within Australia. The regional industry has developed with its main focus on the export market, and accordingly has developed world-competitive farming systems.

The combination of relatively cheap land with a means of producing low cost, low risk home-grown feed, thanks to access to a reliable water supply, not only provided incentive for existing dairy businesses to expand, but also attracted new investment from outside the region.

The farming systems that developed depended on abundant water. In this environment the industry grew and developed a low cost farming system that was based on perennial pasture that was flood irrigated and predominately harvested by direct grazing.

Milk processing companies also grew their investment in the region, as it was seen as a offering a stable and consistent milk supply built on a reliable water supply. As a result, all of the major milk processing companies in Australia have a presence in the region including72:

- Companies with large processing facilities in the region:
  - Murray Goulburn (3 processing plants located at Rochester, Cobram and Kiewa);
  - Fonterra Milk Australia (3 processing plants located at Stanhope, Echuca and Wagga Wagga);
  - Tatura Milk Industries (1 processing plant located at Tatura);
  - Parmalat (1 processing plant located at Bendigo);

- Companies that source milk from the region but process outside of the region:
  - National Foods/Dairy Farmers;
  - United Dairy Power;
  - Australian Consolidated Milk Pty Ltd;73
  - True Organic Cooperative;

- Specialist processors74:

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72 Value Statement – Murray Dairy Milk Processors – Submission to the Guide to the proposed Basin Plan - 2010
73 Australian Consolidated Milk also supply milk to processing companies within the region.
- Nestlé (1 facility located in Tongala); and
- Bega Cheese Limited (1 facility located in Strathmerton).

The dairy industry in the Murray Dairy region has a heavy reliance on the export market for the sale of its manufactured products. Over half the milk produced (56%) in Victoria is exported as manufactured product. The remaining milk is sold as drinking milk (9%) and manufactured product (35%) sold on the domestic market.\(^7^5\)

The drought of the past decade has seen below average rainfall in northern Victoria and southern NSW, and in the major catchment areas that supply the main irrigation storages. This meant reduced annual water allocations. The impact on inflows due to below average rainfall is shown in Figure 4-1.

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\(^7^4\) Specialist processors are not involved in direct milk supply but are value adding to dairy products produced within and outside of the region.


\(^7^6\) Figure 3.2 in MDBA, 2010, *Annual report 2009-10*. Murray-Darling Basin Authority.
Successive years of low water availability impacted on the amount of home-grown feed dairy farmers were able to produce and as a result saw a dramatic decline in milk production. The relative trends of water allocation, milk price and milk production for northern Victoria can be seen in Figure 4-2.

![Milk Volumes and Water allocations](image)

**Figure 4-2. Average water allocation, milk price and milk volume for northern Victoria from 1992-93 to 2009-10.**

The drought-related decline in milk production was not isolated to northern Victoria, as all dairy regions in the state experienced some decline as the pressure on resources increased. However as Figure 4-3 illustrates, the decline in milk production in northern Victoria was relatively more severe, reflecting the restricted ability to grow feed on-farm due to limited water availability.

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77 Milk price - adjusted for inflation and representing Murray Goulburn’s net farm gate milk price. Milk volume – volume of milk produced in northern Victoria (Dairy Australia personal comm.). Water allocation - combined allocation of the Victorian Murray and Goulburn Systems, weighted against volume of entitlement in both systems.
In response to reduced water availability, farmers made enormous changes, integrating more flexible feeding systems with a higher reliance on annual crops and bought-in fodder.

Changes observed in farming systems in the Murray Dairy Region include:

- Changing irrigated areas from perennial pastures to annual pastures, allowing limited irrigation water to be utilised on the shoulder periods (autumn and spring) and maximising the use of winter rainfall. This reduced water use per hectare to 4 to 6 ML, from the 8 to 12 ML required on perennial pastures, although it needs to be noted that total feed production was reduced due to the reduction in total water use.

- Anecdotal information reported by Dairy Australia suggests that the proportion of perennial to annual pasture has changed from 70% to 30%.

- Calving pattern has changed to match feed availability. In 2003-04, the majority of farms had a seasonal calving pattern (57%), with 37% of farms split/batch calving their herd and 7% calving all year round. Since then there has been a big shift towards split calving (52%) to better match feed availability, with 31% of farms now seasonal calving their herd and 7% calving all year round (Dairy Australia, 2004 and 2010).

This more flexible farming system has created additional complexities and cost of production for dairy farmers, including:

- Developing trade relationships with the cropping sector and feed suppliers;
- Increasing their skills in managing complex feed production systems;
- Increased investment in the plant and machinery required for these feeding systems; and
- Interest in alternatives in systems used for on-farm irrigation.

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78 Department of Primary Industries, 2010, *Victoria’s Dairy Industry, Summer 2010.*
80 Dairy Australia (2004 and 2010) *Dairy Situation and Outlook Reports*
The financial pressure that dairy farmers faced is reflected in ABARE farm survey data in the period from 1999/00 to 2007/08 which showed total debt growing by 41% from $367,000 to $518,000 on average. The biggest driver was the increased requirement for working capital which increased by 200% from $84,000 to $255,000 during this time.81

In response to these growing pressures, many farmers implemented short-term coping mechanisms rather than strategies that provide longer-term financial viability. These short-term measures (including increased debt and erosion of capital) are not sustainable long-term.

The reduction in milk production in the GMID has resulted in excess processing capacity within the region. Dairy Australia82 reported that:

…milk processors have coped with diminished milk supply over the past 10 years through:

- Changes to product mix and/or manufacturing processes, including investing in new technologies.
- Importing milk or intermediate products (e.g. milk concentrate) for manufacturing or reprocessing.
- Retiring different aspects of their infrastructure.

This adaptation has seen the closure and change in ownership of some milk production plants in 2010. A recent example of was Murray Goulburn’s closure of their Leitchville factory in February 2010, affecting 80 staff at the plant.

The dairy industry has been rationalising farm numbers since the mid 1950s even though production has continually increased until the last 10 years. This rationalisation has progressed at a faster rate due to the drought and has been assisted by the buy-back program, NVIRP and the farm modernisation program. The drought impact would have been much greater without buy-back putting a substantial floor in the water market and helping to maintain irrigators’ financial balance sheets.

4.1.2 Minimum buy-back scenario

Figure 2-1 (page 11) set out a scenario framework where, if significant additional water did not come out of Victoria, over the period from now to 2019 farming would recover from drought and NVIRP stage 2 would be implemented.

The industry has shown a high level of adaptive capacity as it has managed a period of low water availability. However, this has come with higher risk in terms of added complexity and increases to the cost of production. If buy-back is minimised from Victoria, then the lessons learnt from the drought will put the industry in a strong position to recover.

81 Dairy Australia, 2009, Background paper: Regional situation statement. Report to Dairy Australia.
Currently there is evidence that the industry can recover when water resources are more available. As of October 2011 dairy production in northern Victoria was up 11% on the 2010-11 season.\textsuperscript{83}

A slow but steady improvement in confidence will result as farmers start to see a return to sustained profitability and the ability to reinvest in their businesses. The benefits of an improved irrigation delivery system, combined with on-farm works, will allow farms to improve productivity, which will be necessary in an environment with less water. Competitive advantages of the region will begin to unfold, which will provide opportunities for new investment in the region.

Modelling conducted by RMCG indicates that under the minimised buy-back scenario, a longer term equilibrium milk production in the GMID would be in the order of 1.8 billion litres based on historical levels of productivity. This is illustrated in Figure 4-4 below.

![Figure 4-4. Regional milk production GMID – minimum buy-back scenario.\textsuperscript{84}](image)

If buy-back to meet the shared contribution under the Proposed Basin Plan is minimised from the southern Basin (and therefore Victoria), the industry will be able to continue its recovery from the drought. A critical mass can be achieved, resulting in the dairy industry maintaining its role as a major contributor to the regional economy as well as underpinning the modernised irrigation delivery system.

Dairy farmers taking advantage of a modernised irrigation delivery system and with the confidence to reinvest in their businesses will see advances in water use efficiency. The resulting productivity improvements have the potential to lift milk production to 2.5 billion litres from the 1.8 million litres modelled in Figure 4-4.

\textsuperscript{83} http://www.dairyaustralia.com.au/Statistics-and-markets/Production-and-sales
\textsuperscript{84} source: RMCG analysis.
A lift in regional milk production will improve utilisation of the milk processing facilities and maintain the critical mass required to support the large dairy service industries.

There will be increased opportunities for dairy investment in the region as a lot of the dairy infrastructure in place pre-drought still exists within the region. Combined with relative cheap land, the ability to separate land and water lowering the entry cost for new entrants, proximity to the grain growing regions and access to a world class irrigation delivery system will be some of the competitive advantages that will make it attractive for dairy investment in the region.

As suggested in the discussion of community impacts above (sections 3.2.2 and 3.3.2) this level of dairy production, under the best case scenario, would result in communities not much different than where they are today (barring underlying trends, commodity price impacts etc.), except that the remaining dairy farmers, because of the restructuring and on-farm modernisation, would be very viable.

4.1.3 Maximum buy-back scenario

If the Basin Plan entails a high level of buy-back in the southern Basin from 2015-2019 to meet the shared contribution, the irrigated dairy sector will be highly exposed, as it is a large holder (collectively) of high reliability entitlements.

During the drought most farms were either in a holding pattern or going backwards as they held on to be in a position to recover and resume growth once seasonal conditions improved. The worst case scenario would mean that the water used by the dairy industry as a whole would be similar to that available during the drought.

A distinction needs to be made between the impacts on individual farm businesses and the industry/community overall. Individual farmers will have opportunities to exit or to restructure and remain viable. In fact, in Northern Victoria, the NVIRP modernisation coupled with the on farm funding for modernisation, together, provide enormous opportunities for individual farm businesses to restructure. However, there will be significantly fewer businesses remaining in this scenario, and their water charges may rise significantly, putting pressure on total business costs.

Regional milk production is currently at 1.8 billion litres and there will be a downward trend in milk production. Currently there is surplus processing capacity in the region. If there was no future upside in milk production, then dairy processing companies could be forced to make hard decisions in relation to factory closures.

Modelling conducted by RMCG indicates that under this scenario, longer-term equilibrium milk production in the GMID would be in the order of 1.3 billion litres. This is illustrated in Figure 4-5 below.
The impact of such significantly reduced production on the regional dairy industry would be significant, as the current drought impacted level of production of 1.8 billion litres already has seen a significant shift in the industry. Many townships in the region have suffered the impact of reduced economic activity from dairy farms, including businesses that service those farms.

This scenario would perpetuate the trend experienced during the drought. Such a decline in milk production could threaten the processing efficiencies required for milk factories to remain world-competitive. Milk processors represent a major employer in the region and are of particular importance to the townships where they are located. A closure of a factory in those towns will have dramatic effects as they tend to be the major employer, and the closures will have a ripple impact into the surrounding communities.

Throughout the GMID are smaller communities with high reliance on irrigated dairying and dairy processing; continued decline of the sector would place these communities at significant risk (see discussion in sections 3.2 and 3.3).

Larger communities within the region such as Shepparton would not be immune if milk production was to decline to such an extent. Many of the service industries both to farms and the processing sector are located in these centres.

Whilst this impact would be offset in the short term by the activities of NVIRP and the farm modernisation program, the long term equilibrium would more likely resemble the drought.

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85 source: RMCG analysis.
4.2 Horticulture

The main regions of horticulture production in Victoria are the Mildura region and the Goulburn Murray Irrigation District (including Swan Hill, Goulburn Valley/Cobram and Boort).

The major irrigated sectors in the Mildura Region are almonds, wine, table grapes, citrus, dried fruit, olives, asparagus, melons, carrots, potatoes and other vegetables. The major areas of production include the pumped districts of Merbein, Irymple, Red Cliffs and Robinvale. There was considerable expansion in the Victorian irrigated area from 1997 to 2009, particularly for wine and table grapes and almonds. Much of this growth took place outside the traditional pumped districts.

The Goulburn Murray Irrigation District has areas of significant horticulture production. The Western region produces stone fruit and almonds around Swan Hill (Tresco and Woorinen) whilst olives and vegetables and tomatoes are major crops around the township of Boort (Swan Hill). Large volumes of stone (peaches, apricots, nectarines) and pome fruit (apples, pears) are grown in the Goulburn Valley region (Shepparton East and Ardmona) and Cobram on the Murray.

4.2.1 Context

The past decade has seen significant changes to methods of crop production and the mix of crop that are grown in horticulture. This has been led by significant improvements in technologies and management practices, and the need to continually increase the efficiency of production when competing in global markets.

History demonstrates that the horticulture industry responds to changing export and domestic exports. Changes in the mix of horticulture crops being grown in regions over past decades have been in response to changing prices for specific crops. Recently the oversupply of wine grapes has resulted in low prices for grapes and poor profitability for many farmers in the Mildura region. A significant shift from processing crops (e.g. pears and tomatoes) to fresh market crops (apples and peaches) also has occurred over the past few decades in the eastern part of the GMID. Olives, almonds and some vegetable crops are relatively new entrants to the GMID.

As growers seek to become more efficient they have improved production methods and practices. Labour is a major cost of horticulture and so many businesses seek to minimise labour inputs. Water is a relatively small input cost, however, the extremely high costs associated with the drought (more than $1,000/ML) were not sustainable for many horticulture enterprises.

Over the past decade there has been considerable consolidation of horticulture properties with unprofitable blocks being removed. As growers become profitable again they are looking to invest in capital to expand their production. Vegetable production is seen as an ideal transition crop having lower input costs before an income is realised. However, increasing pressures from imports mean that production of many vegetable crops involves higher risk. The buy-back program has seen around 77GL of entitlements leave the region (so far). This program enabled many people to realise some of their assets (i.e., water entitlements) and either carry on or exit without massive write down of values. This program
was instrumental in alleviating some of the pain that would have occurred in a drought/industry downturn.

For growers to expand their production of perennial horticulture (trees and vines) following the drought entails high capital requirements (in excess of $30,000/ha). In addition a return cannot be expected for 3 to 5 years. With equity for many growers being severely depleted over the past decade (due to low commodity prices and high input costs (including water)), access to capital is difficult. Growth of industries in response to improved commodity prices therefore will be difficult and may not be as rapid as outsiders might expect.

**Mildura Region**

The Mildura region has experienced severe reduction in production particularly in the pumped districts (Merbein, Red Cliffs, Irymple, Robinvale), which represent about 16,000 ha. Reductions in production and drying off of blocks have particularly been associated with the wine grape industry, and hardest hit has been the Merbein region (see also discussion in section 3.4). There has been a 30% decline in the area irrigated in the Mildura pumped districts from 2005/06 to 2010/11 – approximately 5,000 ha no longer irrigated. Merbein has more than 40% of blocks dried off having entered the wine boom late and being of the first to suffer from the declining prices.

In contrast, Robinvale has fared reasonably well being dependent on table grapes, which have experienced a recent increase in commodity price and market demand.

Despite the recent collapse of Clynes (dried fruit processor), the dried fruit industry is currently experiencing under-production with the capacity for the market to double in the short term.

Outside the pumped districts, the area irrigated by private diverters in Victoria from Nyah to SA Border has doubled in area since 1997 (to 55,000 ha). This has largely involved wine grape vineyards and almond orchards. In the last 6 years this growth has moderated and in 2010/11 there was almost 15% (8,000 ha) of the area not irrigated.

**Swan Hill and Goulburn Murray Irrigation District**

Stone fruit production in the Swan Hill region is focused on the fresh market. This sector has been growing over the past decade although weather conditions and water availability have been challenging. The industry needs to continue to be efficient and consolidate the domestic and grow export markets.

The processing fruit industry in the Goulburn Valley has experienced major competition from global producers. This has particularly been the case for canning pears and stone fruit and tomatoes and the trend is likely to continue. Fresh fruit and vegetables have offered more opportunity and are likely to continue should the markets remain stable.

### 4.2.2 Minimum buy-back scenario

If further buy-back from Victoria is minimised, the wine grape restructure may be slowed and individuals would find it more difficult to exit. This situation may be better for the industry and region as a whole but worse for the individual wanting to leave and commence a new career with some financial backing. This will be particularly debilitating for individuals if commodity
prices remain low in the short to medium term (e.g. wine grapes) and district viability will be threatened.

However, if commodity prices improve in the short to medium term then it is likely that little water will be purchased from the horticulture sectors and industries will experience some growth. This highlights the overriding importance of commodity prices for the horticulture industry.

Industry growth and redevelopment of dried off areas may be improved if water is more affordable (not inflated prices) under the minimised buy-back scenario.

The growth potential for horticulture is larger under this scenario due to a greater average market pool of water and larger temporary market in droughts. The practices of the CEWH will be important under conditions when there is little water (see section 1.3.5).

4.2.3 Maximum buy-back scenario

The scenario of maximum buy-backs would facilitate some industries to restructure more rapidly than otherwise. The wine industry would contract in size to a more sustainable production level and the maximum buy-back would enable those who wish to leave the industry to exit with some financial benefits.

The older pumped districts of the Mildura region would be at a greater risk with the likelihood of increased areas dried off. The viability of delivering water to remaining irrigators dotted throughout a district would become increasingly challenging for the water providers (Swiss cheese effect).

The maximum buy-back scenario may inflate the price of water. If this occurs, new horticulture developments and recovery could be slowed.

A smaller temporary market pool would inflate water prices in droughts and cause drying off of lower value horticulture. In this case there is likely to be a long-term reduction in the area of horticulture production with marginal crops no longer being grown e.g. canning pears and some apple varieties. Water prices will stabilise in the longer term based profitability of different sectors.

Irrigation districts that are currently experiencing a high proportion of dried off area (e.g. Merbein and Red Cliffs) are also at risk of becoming rural residential (as per the old Nyah District) unless prices rapidly improve or the land is consolidated and attracts new investors or district expansion. This could possibly occur with larger properties attracting table grapes or dried fruit producers.

The GMID is experiencing infrastructure restructuring through NVIRP. The decision to continue to be irrigated in the GMID is likely to be driven by market conditions with improved supply of water providing an opportunity to maximise production efficiencies. Those that have currently committed to infrastructure upgrades are likely to continue to respond to changing markets. The scenario of maximum water buy-back may offer some horticulture producers to consolidate their businesses through the sale of water and increased efficiencies. It also offers an opportunity for those wanting to leave the industry – for a multitude of reasons.
4.3 Mixed farming

4.3.1 Context

Within northern Victoria a large proportion of the irrigation area and water (over 50%) has traditionally been used for mixed farming, i.e., an extension of dry land farming - irrigated pastures for sheep and beef cattle grazing and irrigation of winter crops mainly cereals. Over the years since the mid 1970s there have been a number of trends:

- The volume used by mixed farms has declined as properties have converted, mainly to dairy but with some horticulture;
- Many of the properties are, in fact, hobby farms or operated by part-timers or life-stylers:
  - Around Shepparton these properties are often used for horse industry/recreation;
  - These properties are major suppliers of fodder for the adjoining dairy industry; and
  - These properties have been major sellers of water to downstream purchasers (wine industry and almond industry in Sunraysia), particularly from the marginal areas around Kerang.

Therefore whilst it appears on the surface that the mixed irrigation farm is a dominant land use, in fact there are very few mixed irrigation farms. Rather, there are some large dryland properties with small strategic areas of irrigation, a large area of mainly dry land, some properties that are really folder producers for the dairy industry and then a large number of part-time life-stylers.

This trend has seen a number of regional impacts:

- The area around Kerang and Pyramid Hill is reverting to dry land with reduced population and lots of restructuring. Because water value is being maintained, most can exit with dignity;
- The area around Rochester is also following this trend; and
- Closer to Shepparton the trend is to more part time properties with very little water, serviced by major irrigation infrastructure.

4.3.2 Minimum buy-back scenario

Overall, the implementation of the Basin Plan to date has accelerated the contraction of the mixed farming sector. It has provided for mixed farms:

- A opportunity to exit particularly during the drought, through buy-back, and through NVIRP paying termination fees with infrastructure rationalisation;
- Development options for those who wish to stay, due to the implementation of NVIRP (a number of those who have elected to stay have taken up the option of on-farm funding).

Without any further buy-back the Basin Plan will continue to impact on mixed farms because:

- Changed water market dynamics and water prices will affect mixed farmers;
- Mixed farms want a no-frills low-cost irrigation system, and have much more than this with NVIRP;
- NVIRP is obliging them to make decisions about their future and implement change which some are not ready for and therefore resist;

- It is likely that there are many mixed farms who have sold their water shares but still have delivery shares which will gradually erode their equity- so those who have not exited will be under considerable pressure. This will be a small but significant group mainly in the west, but also right across the GMID.

In other words, without any more buy-back the same trends apparent today will continue, and water charges (fixed delivery share charges) will be a significant impediment to mixed farming viability.

### 4.3.3 Maximum buy-back scenario

In the maximum buy-back scenario, for mixed farms:

- The pressure to exit will continue, leaving a much-reduced group;

- The large number of part time and/or lifestyle mixed farms is unlikely to be affected (unless the number grows because of increasing supply); and

- Reduced water in the GMID supply system may put pressure on water charges (which mixed farmers can ill afford).

However, strategic buy-back of those farms that are least viable could facilitate the restructuring of the mixed farm sector and provide an opportunity for those who wish to exit.

Regardless of buy-back the investment in the region from the on farm works and the stage 2 of NVIRP will be substantial for the next five or so years; the impact of reduced irrigation production will be most acutely felt once that stimulus ceases.

The CEWH’s water trading activity could also affect mixed farmers, although it is not yet clear what this effect might be. The CEWH may tend to sell allocation when it is dry and buy it when it is wet – the same pattern shown by mixed farmers – which would be a negative outcome for mixed farmers seeking benefit from allocation trading.