



## SOUTH AUSTRALIA - ADDITIONAL EFFICIENCY MEASURES CRITERIA ASSESSMENT OUTCOME

Project Reference No:	643974
Outcome:	Compliant with the Efficiency Measures assessment
Date recommended to proceed to public comment	12 April 2021
Date recommended to proceed to the Australian Government's detailed assessment stage	25 June 2021

### Overview

The project involves the redevelopment of a 3.1ha citrus and avocado patch on the 9.3ha property located at Renmark West in the Riverland SA. The redevelopment comprises of replanting old low yielding varieties to current commercial high demand varieties on rootstock, the irrigation system will also receive an upgrade replacing old worn out full cover under tree sprinklers with new partial cover micro sprinklers.

This redevelopment will also be installing new sections of mainline and additions to the automation system.

Loggable soil moisture probes will assist in the precise application and timing of irrigation and shifts. This will create a system where the irrigator can monitor plant water use in real time and apply irrigation to meet the specific crop demands.

A cooling sprinkler system will also be installed to help alleviate serious damage to the fruit and trees that can be caused by extremes in temperature.

A conservative water saving of 9.2ML, or ~1.2ML/ha will be generated through the project works.

### Part 1 - State Assessment - Efficiency Measures criteria

#### Assessment Approach

This State Assessment is reliant on the information provided by the applicant. The comments provide a summary of the information provided by the applicant which is deemed relevant by the assessor to demonstrate that the Efficiency Measures – Agreed Criteria have been met.

#### Water Savings Substantiation

The water savings expected to be achieved by the project have been verified by an Independent Approved Irrigation Professional.

The water savings substantiation is provided at Attachment A.

The project is expected to return a conservative 9.2 ML to the environment, with the applicant retaining 8.2 ML of water savings.

Water Saving Component	Area ha	Water Saving (ML/ha)	Estimated Water Saving (ML)	Total volume of Eligible Water Rights offered for transfer (ML)
Full Cover to Partial Cover Sprinkler	3.1	1.5	4.7	9.2
Cooling Sprinklers	3.1	2.1	6.4	
Automation (New)	3.1	0.5	1.6	
Soil Moisture Monitoring Probes (New)	9.3	0.5	4.7	
Total Water Saving			17.4	

Efficiency Measures Criteria	Project Responses to Efficiency Measures Criteria	Adequate Response Y/N	State Assessment
<b>Evidence of engagement with community, industry and government agencies during project design (Criteria 9, 6a, 6b)</b>	<p>6a. Please refer to Attachment B from the Renmark Irrigation Trust (RIT).</p> <p>6b. The Delivery Partner was engaged by the Australian Government in December 2018. Since this time the Delivery Partner has undertaken extensive consultation on the Water Efficiency Program with key stakeholders within the SA MDB region. Direct engagement with industry and commodity groups, irrigation infrastructure operators, Local Government, Regional Development organisations has occurred on the program. The works proposed through this project are consistent with regional plans and strategies on sustainable land and water management practices and building resilience and adaptability into the irrigated agriculture sector.</p> <p>9a. Please refer to response to 6b.</p> <p>9b. Please refer to response to 5b.</p>	Y	<p>The application has demonstrated that the delivery partner has consulted with relevant industry bodies, relevant Irrigation Infrastructure Operators, local governments and regional development organisations on a strategic regional approach to developing projects under the Water Efficiency Program.</p> <p>The application has also provided evidence that the relevant network operator, the Renmark Irrigation Trust, is involved in or aware of the project.</p>
<b>Potential Direct Water Market Impacts (Criteria 7a, 7b, 7c, 7d)</b>	<p>7a. Refer to Attachment B (Renmark Irrigation Trust Summary) confirming that the volume of water entitlement owned and the period of ownership. The project has been independently assessed which included the provision of formal quotations to establish</p>	Y	<p>The application has demonstrated that:</p> <ul style="list-style-type: none"> <li>• The water rights to be transferred as part of the project have been independently verified as a conservative estimate of the water savings that can be generated and that the project will not</li> </ul>

	<p>the budget for the project. This assessment confirms that a conservative volume of the total assessed potential water saving has been nominated for return and that additional savings will be retained by the proponent. The water savings are based on industry benchmarks (crop and irrigation system type specific) that have been collated over a long period of time from local and district on-farm water use studies and investigations.</p> <p>7b. Attachment B (Renmark Irrigation Trust Summary) verifies that the nominated water access entitlement meets the 3 year ownership requirement.</p> <p>7c. As the property involved in this proposal produces permanent tree crops water is committed to on-farm production on an annual basis. The project works will however reduce the annual irrigation demand through the improved efficiency of on-farm water use and as a result there will be no direct impact on the reliability of water as a result of this project. This outcome (reduction in irrigation demand) will be replicated through other projects so at a cumulative scale is expected to generate additional water for irrigated production.</p> <p>7d. As described above in 7c. this project will generate a net increase in water supply and together with the small volume will not directly increase the price of water. Analysis</p>		<p>transfer more water than the project will save.</p> <ul style="list-style-type: none"> <li>• The water entitlements to be transferred have been held for a minimum of 3 years at the time of application.</li> </ul> <p>The project will generate water savings above the volume returned to the environment and will effectively increase the water available for productive uses in the consumptive pool. The increase in available water will have no direct impact on reliability and may put downward pressure on water market prices.</p>
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	<p>conducted by the Delivery Partner also highlights that the period of most rapid increase in water market prices in the sMDB occurred when water recovery programs were not active further highlighting the indirect impact of programs on water prices.</p>		
<p><b>Contribution to Proponent Businesses and Irrigation District Viability (Criteria 4a, 4b, 4c)</b></p>	<p>4a. As was outlined in 2a. the property where works are proposed is located within the footprint of the Renmark Irrigation Trust (RIT). RIT has a strong commitment to the adoption of best practice irrigation both with respect to supply of water to customers and customers application of that water. The Renmark community and the broader Riverland region is heavily dependent on the irrigated agriculture sector to drive the economy and therefore projects that invest in the longer term sustainability of businesses are vitally important for ensuring the economic contribution is maintained and enhanced into the future.</p> <p>4b. The property where the project works are proposed is located within the Renmark Irrigation Trust which has been fully piped since 1975 and services over 600 irrigators. The works are focused on on-farm upgrades and will have no impact on existing supply infrastructure.</p> <p>4c. As has been outlined in both 4a. and 4b. the property is serviced by an irrigation infrastructure operator whose business plan</p>	Y	<p>The application has demonstrated that:</p> <ul style="list-style-type: none"> <li>• The project will contribute to the longer term sustainability of the business and the irrigation district more generally.</li> <li>• The project is focused on modernising existing inefficient irrigation systems, which will position the business to capitalise on returns for wine grape production in the SA Riverland.</li> <li>• The project will contribute to the longer term viability of the property, which will provide benefits across the trust and irrigation district more broadly, consistent with current business plans.</li> </ul>

	is reliant on its customers being viable and sustainable into the future. This project will significantly improve the productivity of on-farm water use and also increase annual turnover for the property which is consistent with longer plans for the irrigation infrastructure operator.		
<b>Support for Regional Economies (Criteria 5a, 5b, 5c, 5d, 6c)</b>	<p>5a. All irrigation components will be sourced from suppliers based in the local Renmark community which will ensure the program investment remains in the local community and provides economic stimulus. The works will also ensure the property continues to support seasonal employment engaged in fruit picking, packing, processing and distribution activities.</p> <p>5b. This proposal is well aligned with local and regional strategies with respect to sustainable water use and supporting viable and adaptive irrigation enterprises. Failure to upgrade the existing irrigation infrastructure would result in the property not maximising its potential productivity making it more exposed into the future.</p> <p>5c. As described in 4b. the properties are located within the Renmark Irrigation Trust (RIT) which has been fully piped since 1975. The proposed on-farm works will not reduce the productive capacity of the trust and no change to the proponent's delivery shares that are held within RIT will occur as a result</p>	Y	<p>The application has demonstrated that the project will:</p> <ul style="list-style-type: none"> <li>• Support the citrus industry, which is an important sector of the Riverland and SA economy.</li> <li>• Maintain and potentially increase seasonal employment along with engaging local contractors during the redevelopment and construction phase.</li> <li>• Generate benefits for the broader region and not just the applicant through the sourcing of local farm input supplies by the participating business and generating regional employment.</li> <li>• Increase regional and Basin wide productivity through increasing the volume of water available for consumptive uses on the water market.</li> </ul>

	<p>of the project.</p> <p>5d. It is expected that the works will generate additional seasonal employment due to the increased production that will occur at the property. The increased production will also ensure higher volumes of product are delivered to local packing sheds which will assist with securing employment in these sectors of the supply chain.</p> <p>6c. While the project will deliver significant positive socio-economic outcomes for the participant these benefits will extend beyond the farm gate as a result of direct program investment in the local community and increased productivity which will provide a broader regional and State level benefit. The proposal will also generate retained water savings for the applicant which will increase the volume of water available in the consumptive pool which will deliver benefits at the broader sMDB scale.</p>		
<b>Social and Environmental Benefits (Criteria 2a, 2b, 2c,)</b>	<p>2a. The property where the works are proposed is located near Renmark in the SA Riverland region. The property is serviced by the Renmark Irrigation Trust (RIT) who were the first agricultural site and first irrigation water provider in the world to be awarded gold level certification by the Alliance for Water Stewardship. A key component of achieving this unique honour is the demonstration of best practice irrigation</p>	Y	<p>The application has:</p> <ul style="list-style-type: none"> <li>• Described the expected socio-economic and environmental benefits of their proposed project, which include: <ul style="list-style-type: none"> <li>○ Increased productivity in terms of return per megalitre for the business and region.</li> <li>○ Improving the business' long term resilience and viability, which will have flow on benefits to the local, regional and</li> </ul> </li> </ul>

	<p>management in the context of delivering socio-economic and environmental outcomes. The works will deliver improvements in the productivity of on-farm water use and reduce the irrigation induced impacts on the local environment through more efficient practices. The goods and services will be sourced directly from local and regional based businesses which will mean the economic stimulus generated by the project will remain in, and benefit the local community. The works will also generate lifestyle benefits to the proponent through minimising travel between properties resulting in an improved work/life balance.</p> <p>2b. As this project only involved on-farm works it is not expected to add amenity to community assets such as weirs, storages and parks.</p> <p>2c. N/A – Total cost is under \$4 million.</p>		<p>State economies.</p> <ul style="list-style-type: none"> <li>○ Sourcing of goods and services for the project from local companies, which will add further economic stimulus to the Riverland community.</li> <li>○ Increased regional and Basin wide productivity through increasing the volume of water available for consumptive uses on the water market.</li> </ul> <ul style="list-style-type: none"> <li>● The proposed works are on-farm and will not affect the amenity value to local communities of weirs, storages and parks.</li> <li>● The project is below the \$4 million threshold for large projects and is not required to address criteria 2c.</li> </ul>
<b>Comply with all relevant laws including work health and safety laws. (Criteria 2d)</b>	<p>2d. The Delivery Partner has well established WHS management procedures in place which have been specifically tailored to the implementation of Australian Government irrigation efficiency programs. The proponent will be required to complete a Risk Assessment specific to the project activities and demonstrate that all required insurance is in place and current prior to the project works commencing and any funds being paid.</p>	Y	<p>The application has demonstrated that the applicant and delivery partner have an understanding of all relevant legislation and/or regulation that will require approval prior to works commencing and that they will comply with all relevant laws including work health and safety laws.</p>



<b>Business Resilience, including Drought and Climate Change Impacts (Criteria 10a, 13a, 12)</b>	<p>10a. Please refer to response to 5b.</p> <p>12a. As described in 7a. the project proposal has been independently assessed and this assessment confirms that a conservative volume of the total water saving is nominated for return. The project works budget has also been substantiated through formal quotations.</p> <p>13a. As has been described in the responses to previous criteria the project works will generate water savings in addition to the volume that is nominated for return to the Australian Government. These retained savings will assist the enterprise to be more resilient during periods of reduced water availability which are expected to be more common, or volatile into the future. The project works will also assist the business to increase its annual turnover which will also provide the applicant to better manage challenges induced by climate variability. The project works will deliver benefits beyond the farm gate as a result of reducing its annual irrigation demand and creating additional supply within the consumptive pool.</p>	<p>Y</p>	<p>The application has demonstrated that the project will:</p> <ul style="list-style-type: none"> <li>• Modernise existing inefficient irrigation systems, which will position the business to capitalise on returns for citrus and avocado production in the SA Riverland.</li> <li>• Generate additional water savings that will be retained by the applicant to improve their capacity to better manage periods of reduced water availability.</li> <li>• Provide the enterprise with an increased ability to endure and adapt to future climate variability and water availability by generating productivity improvements and improving profitability.</li> </ul>
<b>Cultural Benefits (Criteria 8a, 8b, 8c)</b>	<p>8a. As has been outlined in the responses to previous criteria the project is expected to generate positive outcomes at a local and regional community scale. The project works will ensure an existing irrigated business remains viable and sustainable into the future</p>	<p>Y</p>	<p>The application has described the expected cultural benefits of the proposed project, including the strategy for increasing the cultural benefit to participants and their communities through local sourcing of goods, services and labour.</p>

	<p>which is very important given the Riverland region of SA is heavily reliant on a prosperous and high performing irrigated agriculture sector. The transfer of a share of the water savings generated from the project to the Australian Government will also ensure that a portfolio of water is available to e-water managers to assist with the maintenance of priority ecological assets across the Murray-Darling Basin. With tourism and recreation also key drivers of the Riverland and State.</p> <p>8b. As has been outlined in other criteria the project represents a direct investment in an irrigated business to ensure its longer term sustainability and viability. This outcome contributes benefits at the community, region and State level by underpinning existing employment both on-farm and within the processing and distribution networks. All goods and services for the project will be sourced from local suppliers and contractors ensuring program investment remains in the local community and region. The project will also adopt innovative irrigation management technologies which can be showcased to encourage broader adoption and highlight the region's longer term commitment to sustainable land and water management practices.</p> <p>8c. N/A – project is not over \$3 million.</p>		<p>The total project value is below \$3 million and is not required to identify cultural heritage sites and manage any impacts in accordance with relevant Commonwealth and State laws.</p>
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**In-Principle Recommendation**

The application has adequately addressed the Efficiency Measures – Agreed Criteria and demonstrated that the project will have neutral or positive socio-economic impacts and not have negative third party impacts on irrigation systems, water markets or regional communities. Accordingly, the South Australian Government provides in-principle approval for the project and recommends that the application proceed to the **public comment stage**.

## Part 2 - State Response – Public Comments

Relevant Public Comments to be responded to	Response to Relevant Public Comments
It is clear this project will have negative socio-economic impacts at a broader regional level as there will simply be less water available for agriculture.	<p>The South Australian Government prefers efficiency measures to recover water for the environment, as they provide real and positive outcomes to irrigation businesses, while supporting communities that would otherwise be hard hit by the reduction in regional productivity or the closure of businesses through water leaving the consumptive pool through buybacks.</p> <p>Unlike water buybacks that remove water from the consumptive pool, efficiency measures increase the volume of water available. Properly constructed efficiency measures projects recover water that is effectively “lost” through evaporation, leaky infrastructure and inefficient irrigation systems or overwatering and is unavailable for use until projects are completed.</p> <p>The water savings for all South Australian on-farm projects have been independently verified as a conservative estimated of water savings. Those water savings were not previously available to the consumptive pool.</p> <p>Additionally, all proponents of on farm projects in South Australia under the efficiency measures program have retained a portion of the water savings generated from their projects. This is increasing supply and putting downward pressure on water market prices.</p> <p>Accordingly, South Australian projects are increasing the water available for consumptive uses across the southern connected Murray-Darling Basin and have not reduced the amount of water available for agricultural use.</p> <p>South Australia continues to encourage participation in on-farm efficiency measures projects to generate positive outcomes for irrigators and regional communities, and is assessing all applications in full accordance with the Murray-Darling Basin Ministerial Council agreed socio-economic criteria.</p>
Any project that decreases the total pool available to food production results in negative outcomes.	
On-farm projects reduce the total amount of water available to agriculture. While this proponent claims they will become more efficient with their water use, agriculture as a whole in the Basin will be worse off as there is simply less for agriculture to use.	
South Australia remains the only State not adhering to the agreed socio-economic criteria.	
Evidence suggests that those who participate in on-farm projects do require additional water and do enter the	Both the ABARE and Aither reports have acknowledged that it is difficult to separate the

<p>water market, thus driving up the price. There is no guarantee that this project will not enter the market.</p>	<p>impact of water recovery from other major trends such as climate change and the significant growth in industries and as such the findings should be treated with caution.</p> <p>The ABARE report draws heavily on a recent study undertaken by ABARES, available at <a href="https://onlinelibrary.wiley.com/doi/full/10.1111/1467-8462.12396?af=R">https://onlinelibrary.wiley.com/doi/full/10.1111/1467-8462.12396?af=R</a> This study found that some on-farm program participants subsequently purchased water to increase their irrigated production. The study did not however directly link this to participation in the program and noted that many other demographic and economic factors are likely to influence business decisions. In fact, it is specifically stated that the study did not attempt to define or separately quantify direct and indirect effects of on-farm efficiency measures projects on water prices.</p> <p>The ABARES study also evaluated many projects that would not meet the criteria agreed by the MDB Ministerial Council and as a result, no conclusions can be drawn between the findings of this study and on-farm efficiency measures projects that have been submitted since these criteria were agreed.</p> <p>The Aither report appears to treat water recovered through on-farm efficiency measures the same as buybacks. This fails to recognise that on-farm efficiency measures are reducing demand by the same amount and in most cases more than the corresponding reduction in supply.</p> <p>Accordingly, it would be incorrect to infer that South Australian on-farm projects are directly attributable to increased water use and higher water market prices when they are consistently reducing water demand and increasing supply.</p> <p>Any expansion of irrigated area and hence water use that occurs post on-farm project is an indirect effect of the program and is likely to be driven by many other complex and interrelated economic and social factors. These indirect impacts are not considered as part of the socio economic assessment.</p>
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**Final Recommendation**

The application has adequately addressed the Efficiency Measures – Agreed Criteria and demonstrated that the project will have neutral or positive socio-economic impacts and not have negative third party impacts on irrigation systems, water markets or regional communities. Accordingly, it is recommended that the application proceed to the Australian Government's detailed assessment stage.

## 1 PROJECT DETAILS:

CID Name:		Date:	23/02/2021
CID No:		Client Name:	
Project Name:		Project No:	
Submitted By:		Contractors:	

## 2 PREAMBLE AND PROJECT SCOPE:

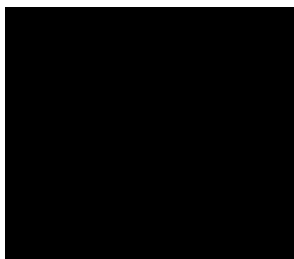
The above project was assessed on the below mentioned scope and is limited to project data supplied, including any documentation and designs as being true and correct in every respect.

I declare, as an Independent Approved Irrigation Professional agreed to under the Deed, that:

- I have carried out the technical and practical feasibility assessment for the Works; and
- I have had no previous involvement in preparing this Project Proposal.

I certify that the Project Works are technically and practically feasible, including that:

- the projected water savings they will generate are reasonable and realistic, including being appropriate to the crops, soils, climates, water delivery system and topography of the Eligible Irrigator's Property;
- the rationale for the water savings assessment is clearly explained;
- the projected water savings can be achieved while maintaining the agricultural production potential of the Property on which the Works would be completed as part of a Project;
- the engineering solutions they entail are achievable and appropriate to the needs of the Eligible Irrigator and the Property;
- the projected costs are reasonable and realistic, and within the expected range for that type of infrastructure and scale of installation; and
- the projected water savings they will generate represent the conservative or minimum feasible volume that could be derived from completing the Works.



Certified Irrigation Designer



# **Water Savings Substantiation – Water Efficiency Program (WEP)**

## **Technical Assessment**

**Project ID:** [REDACTED]

**Crop Type:** Citrus, Avocado

### **Project Summary:**

The project involves the redevelopment of a 3.1ha citrus and avocado patch on the 9.3ha property located at Renmark West in the Riverland SA. The redevelopment comprises of replanting old low yielding varieties to current commercial high demand varieties on rootstock, the irrigation system will also receive an upgrade replacing old worn out full cover under tree sprinklers with new partial cover micro sprinklers.

This redevelopment will also be installing new sections of mainline and additions to the automation system.

Loggable soil moisture probes will assist in the precise application and timing of irrigation and shifts. This will create a system where the irrigator can monitor plant water use in real time and apply irrigation to meet the specific crop demands.

A cooling sprinkler system will also be installed to help alleviate serious damage to the fruit and trees that can be caused by extremes in temperature.

A conservative water saving of 9.2ML, or ~1.2ML/ha will be generated through the project works.

### **Water Saving Methodology:**

Over time the existing full cover sprinkler system in an old 3.1ha area of the property has become worn and is now operating outside of the original design specifications. The installation of a new partial cover micro-sprinkler irrigation system is expected to generate water savings through improved distribution uniformity that will ensure water use is optimised. There will also be benefits to the crop through more targeted application of nutrients applied through the system matching the plants specific needs leading to an expected increase in production and profitability.

In addition to the upgrade of the main irrigation system a new cooling irrigation system will also be installed concurrently with the redevelopment of the 3.1ha area. This will assist with managing extreme heat in the orchard and also provide water savings through the ability to utilise a significantly lower application rate system e.g. 7.3mm/hr vs. 1.3mm/hr.

With an average of 12.4 days above 35°C per annum in Renmark ([www.bom.gov.au](http://www.bom.gov.au)) and based on applying 3-4 hours of irrigation on these days for the sole purposes of orchard cooling the purposely designed misting system will generate significant water savings compared to the operation of the main irrigation system for the same purpose. With the number of extreme heat days predicted to increase into the future the cooling system will ensure that the orchard is best placed to mitigate this while still optimising the productivity and efficiency of on-farm water use.

The installation of new soil moisture monitoring probes across the full property will provide information to optimise irrigation decision making, the probes are a web based continuous logging soil moisture monitoring system which will provide real-time information to optimise irrigation



decision making. With the property containing a mix of crop types and ages the data provided by the soil moisture probes will enable irrigation scheduling to best meet specific crop and age water requirements.

The automation system will be upgraded in the 3.1ha area which will ensure the benefits that are achieved through the cooling irrigation system are maximised while also ensuring standard irrigation scheduling is as efficient as possible.

Water Saving Activity	Area ha	Water Saving (ML/ha)	Total Water Saving (ML)	Conservative Saving (ML)	Conservative Saving (ML/ha)
Full Cover to Partial Cover Micro Sprinkler	3.1	1.5	4.7	9.2	1.23
Cooling Sprinklers	3.1	2.1^	6.4		
Automation (New)	3.1	0.5	1.6		
Soil Moisture Monitoring Probes (New)	9.3	0.5	4.7		
TOTAL			17.4		

^ Application Rate 7.3mm/hr vs. 1.3mm/hr @ 3 hours/day x 12 days >35C per year

#### Project Budget:

Project costs have been based quotes provided by [REDACTED]

#### Irrigation Design:

An Irrigation Design for both the main irrigation and the cooling system has been prepared by a certified designer and are included as attachments to the proposal.

#### Approvals/Environmental:

No approvals are required to conduct the works as the works are occurring on private property and the activities will not have an adverse environmental impact on the property or surrounds.

The specific irrigation efficiency improvements will contribute to reducing deep drainage beyond the crop root zone and hence improved salinity outcomes for the River Murray.

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