

SOUTH AUSTRALIA - ADDITIONAL EFFICIENCY MEASURES CRITERIA ASSESSMENT OUTCOME

Project Reference No:	617470
Outcome:	Compliant with the Efficiency Measures assessment
Date recommended to proceed to public comment	19 March 2021
Date recommended to proceed to the Australian Government's detailed assessment stage	31 May 2021

Overview

The project involves improving the irrigation system by removing restrictions and increasing flexibility on 14.7ha of wine grape property located at Loveday in the Riverland SA. The system improvements include the installation of new automatic primary filtration that is matched to the system output for irrigating in one shift and a variable frequency drive to run the pump motor.

Currently the property is irrigated in three shifts due to the limitations of the existing filtration system. This has caused issues with both over and under watering creating substantial vineyard management issues resulting in crop loss and poor vine performance.

The large fixed speed pump and motor were installed when the property had overhead sprinklers, after the conversion to drip irrigation the pump had to be choked restricting the flow to match the capabilities of the existing filtration system. This is causing the pump motor to run outside of its optimum range or curve creating significant inefficiencies in delivery and power.

A conservative water return of 3ML, or 0.21ML/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 3.0 ML to the environment, with the applicant retaining 8.0 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)
Automatic Primary Filtration & Variable Frequency Drive	14.7	0.75	11.0	3.0
Total Water Saving			11.0	

Efficiency Measures Criteria	Project Responses to Efficiency Measures Criteria	Adequate Response Y/N	State Assessment
<p>Evidence of engagement with community, industry and government agencies during project design (Criteria 9, 6a, 6b)</p>	<p>6a. Please refer to attachment B from the Central Irrigation Trust (CIT) (Water Entitlement Details from CIT).</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 6b (see above)</p> <p>9b. Please refer to response 5b (see below)</p>	<p>Y</p>	<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 Central Irrigation Trust, is involved in or aware of the project.</p>
<p>Potential Direct Water Market Impacts (Criteria 7a, 7b, 7c, 7d)</p>	<p>7a. Refer to Attachment B (Central 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</p>	<p>Y</p>	<p>The application has demonstrated that:</p> <ul style="list-style-type: none"> • 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

	<p>provision of formal quotations to establish 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 (Central Irrigation Trust Summary) verifies that the nominated water access entitlement meets the 3 year ownership requirement.</p> <p>7c. The project works result in a conservative reduction in annual irrigation demand (11ML) however the proponent is only seeking to return a conservative volume (3ML) of the assessed saving meaning the net impact is positive post project works from a water demand/supply context. The volume of water to be recovered through this project is also only small and based on best projections of future water recovery potential would represent less than 0.01% of the SDL in the southern connected MDB.</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"> • The water entitlements to be transferred have been held for a minimum of 3 years at the time of application. <p>The project will generate water savings above the volume returned to the environment and will effectively increase the water available for productive uses within 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 the price of water.</p>		
<p>Contribution to Proponent Businesses and Irrigation District Viability (Criteria 4a, 4b, 4c)</p>	<p>4a. The properties where works are proposed to occur through this project are all serviced by the Central Irrigation Trust (CIT). The CIT network is already a fully piped, pressurised supply and the on-farm works will ensure the properties are viable long into the future which provides benefits at both the irrigation district/trust and regional scale. The works do not involve any change to the volume of Water Delivery Rights held by the applicant within the irrigation trust network and as such the applicant will continue contributing both fixed and usage charges to the Irrigation Infrastructure Operator.</p> <p>4b. The property is located in the Cobdogla Irrigation Trust and is serviced by the water delivery systems provided by the trust. There is a high density of properties in the area that are all serviced by the Cobdogla Irrigation Trust and therefore the infrastructure will remain a critical component of the trust operations into the future. The works are focused on on-farm upgrades that will have no impact on existing supply infrastructure or any other customers within the network.</p>	<p>Y</p>	<p>The application has demonstrated that:</p> <ul style="list-style-type: none"> • The project will contribute to the longer term sustainability of the business and the irrigation district more generally. • 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. • 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.

	<p>4c. As has been outlined in both 4a. and 4b. the property is serviced by an irrigation infrastructure operator whose business plan 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.</p>		
<p>Support for Regional Economies (Criteria 5a, 5b, 5c, 5d, 6c)</p>	<p>5a. The wine grape industry is a critical sector of the Riverland region with the farm gate income for Riverland wine grape growers \$175M in the 2019 season (Source: Riverland Wine). Ensuring the on-going sustainability and profitability of the wine grape industry has major flow on benefits to local towns, the Riverland region, the State and the nation.</p> <p>5b. Currently on-farm water use is limited by the inefficient irrigation system which by extension impacts on the volume and quality of fruit that is produced. It is anticipated that these works will significantly increase the productivity (t/ML) and profitability (\$/ML) of on-farm water use. Projections suggest a significant increase in yield (t/ha) will be achieved and a higher percentage of fruit will reach premium quality brackets meaning profitability will significantly increase.</p> <p>5c. As has been mentioned in the responses</p>	<p>Y</p>	<p>The application has demonstrated that the project will:</p> <ul style="list-style-type: none"> • Support the wine grape and wine industry, which is an important sector of the Riverland and SA economy. • Maintain and potentially increase seasonal employment during the harvest period along with engaging local contractors during the redevelopment and construction phase. • Generate benefits for the broader region and not just the applicant through sourcing of local farm input supplies and generating regional employment. • Increase regional and Basin wide productivity through increasing the volume of water available for consumptive uses on the water market.

	<p>to previous criteria the property is located within the Cobdogla Irrigation Trust and the works are focused on investing in the property to ensure it is sustainable and viable in the longer term. The project does not involve any reduction in held delivery shares within the trust and therefore these fixed charges will continue to be met by the project proponent into the future and ensure the productive capacity of the irrigation district is maintained.</p> <p>5d. The proposal will under-pin existing direct employment and also ensure employment along the supply chain via harvesting, processing and distribution of wine grapes is maintained and potentially enhanced.</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>		
<p>Social and Environmental Benefits (Criteria 2a, 2b, 2c,)</p>	<p>2a. The works proposed through this project will assist the business to significantly improve the productivity of its on-farm water use. The works will directly facilitate an</p>	<p>Y</p>	<p>The application has:</p> <ul style="list-style-type: none"> • Described the expected socio-economic and environmental benefits of their proposed project,

	<p>increase in annual revenue that is derived from the existing irrigated crops which will assist with under-pinning the current levels of on-going and seasonal employment. The existing inefficiencies in the system is meaning that irrigation water is not being utilised as productively as it potentially could be which is impacting on fruit production and the overall performance of the vineyard. Irrigated agriculture is the primary driver of the Riverland economy and therefore the project will ensure that this important economic contribution continues well into the future.</p> <p>All works involved in the project will be undertaken by local contractors so investment will remain the local economy and benefit local service providers. The works will also set the vineyard up for the future and ensure it remains financially viable and continues to support both on-farm employment and other agriculture dependent businesses both locally and across the region. The project will deliver direct benefits at the farm scale through the improved productivity of water use which will then have flow on benefits to the region's broader wine industry sector and the State through economic contributions.</p> <p>2b. As this project is focused on on-farm works it is not expected to directly contribute to amenity values within the local</p>		<p>which include:</p> <ul style="list-style-type: none"> ○ Increased productivity in terms of return per megalitre for the business and region. ○ Improving the business' long term resilience and viability, which will have flow on benefits to the local, regional and State economies. ○ Sourcing of goods and services for the project from local companies, which will add further economic stimulus to the Riverland community. ○ Increased regional and Basin wide productivity through increasing the volume of water available for consumptive uses on the water market. <ul style="list-style-type: none"> ● The proposed works are on-farm and will not affect the amenity value to local communities of weirs, storages and parks. ● The project is below the \$4 million threshold for large projects and is not required to address criteria 2c.
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	community. 2c. N/A		
Comply with all relevant laws including work health and safety laws. (Criteria 2d)	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.	Y	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.
Business Resilience, including Drought and Climate Change Impacts (Criteria 10a, 13a, 12)	10a. Please refer to response 5b. 12. 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. 13a. Currently one of the key challenges for the proponent is the limited delivery capacity in the properties filtration system. This means that the system currently struggles to supply daily vine irrigation requirements and this situation is very likely to be exacerbated under a warming climate and increased incidence of heat waves. This project will directly address this issue through increasing capacity and providing some flexibility with	Y	The application has demonstrated that the project will: <ul style="list-style-type: none"> • Modernise existing inefficient irrigation systems, which will position the business to capitalise on returns for wine grape production in the SA Riverland. • Generate additional water savings that will be retained by the applicant to improve their capacity to better manage periods of reduced water availability. • 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.

	<p>water use and an improved ability to meet vine water demand. The works will also deliver water savings which will assist with managing water into the future through reducing on-farm demand and generating a net increase in water supply.</p>		
<p>Cultural Benefits (Criteria 8a, 8b, 8c)</p>	<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 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. The project will engage local contractors to deliver all works which will provide a direct economic stimulus within the local community. It is these same local agricultural service businesses that in turn support local community and sporting organisations via sponsorship. The Riverland region and the small towns within the region are very reliant on a sustainable irrigation industry to drive</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>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>

	<p>the local economy. Improvements in water management also help to assist to deliver flow-on benefits to local and regional environmental assets such as the River Murray and wetlands and floodplains.</p> <p>8c. N/A</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
<p>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>	<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>
<p>Any project that decreases the total pool available to food production results in negative outcomes.</p>	
<p>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.</p>	
<p>South Australia remains the only State not adhering to the agreed socio-economic criteria.</p>	

Evidence suggests that those who participate in on-farm projects do require additional water and do enter the water market, thus driving up the price. There is no guarantee that this project will not enter the market.

Both the ABARE and Aither reports have acknowledged that it is difficult to separate the 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.

The ABARE report draws heavily on a recent study undertaken by ABARES, available at <https://onlinelibrary.wiley.com/doi/full/10.1111/1467-8462.12396?af=R> 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.

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.

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.

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.

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.

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:	[REDACTED]	Date:	7/12/2020
CID No:	[REDACTED]	Client Name:	[REDACTED]
Project Name:	[REDACTED]	Project No:	[REDACTED]
Submitted By:	[REDACTED]	Contractors:	[REDACTED]

2 PREAMBLE AND PROJECT SCOPE:

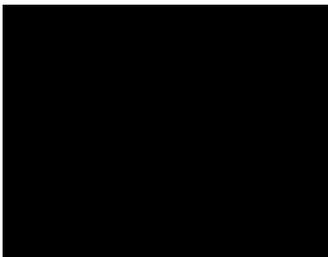
The above project was assessed on the below mentioned scope and is limited to project data supplied, including any documentation and designs as being true and correct in every respect.

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

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

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

- a) 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;
- b) the rationale for the water savings assessment is clearly explained;
- c) 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;
- d) the engineering solutions they entail are achievable and appropriate to the needs of the Eligible Irrigator and the Property;
- e) the projected costs are reasonable and realistic, and within the expected range for that type of infrastructure and scale of installation; and
- f) 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: Wine Grapes

Project Summary:

The project involves improving irrigation management by addressing existing limitations and increasing flexibility on a 14.7ha of wine grape property located at [REDACTED] in the Riverland region of SA. The system improvements include the installation of new automatic primary filtration that is matched to the system output for irrigating the property in a single shift and a variable frequency drive to run the pump motor.

Currently the property is irrigated in three shifts due to the limitations within the existing primary filtration system. This has caused substantial issues with the management of the vineyard resulting in the vines not producing to their maximum potential which impacts on enterprise viability.

The large fixed speed pump and motor were installed when the property was irrigated with overhead sprinklers which post the conversion to drip irrigation the pump has had to be choked to restrict the flow to match the capabilities of the existing filtration system. This is causing the pump motor to run outside of its optimum range leading to significant inefficiencies in delivery and power usage.

A conservative water saving of 3.0ML, or ~0.21ML/ha will be generated through the project works.

Water Saving Methodology:

The installation of a new automatic main filtration unit will remove a major system constraint allowing the property to be irrigated in a single shift and enabling irrigation of the full property to occur at night reducing evaporative losses and generating significant power savings.

It will also ensure system maintenance activities occur as efficiently as possible reducing the amount of water that is used to maintain the performance of the existing surface drip irrigation system. The filtration unit will also be capable of managing varying water quality and allowing back-flushing to occur in a more efficient manner through the use of a pressure differential device.

The primary water saving will be achieved by coupling a VFD to a much larger older pump which is choked with a gate valve to manipulate the flow rate to achieve the required valve unit and shift flows. There is a limit to which the flow rate can be reduced which creates irrigation management issues especially during vintage. The proposed works are expected to generate water savings through improvements to irrigation scheduling and the ability to target irrigation scheduling based on specific crop age and varietal irrigation requirements.

The combination of the primary filtration works and the installation of VFD is expected to generate up to a 10% efficiency in irrigation water use. The works will also achieve major efficiencies in power usage by effectively eliminating irrigation during peak tariff peaks due to the ability to irrigate the property in a single irrigation shift compared to the 3 that is currently required. The combination of water and power savings will result in a much improved return per ML of water applied.

Water Saving Activity	Area ha	Water Saving (ML/ha)	Total Water Saving (ML)	Conservative Saving (ML)	Conservative Saving (ML/ha)
Automatic Primary Filtration & Variable Frequency Drive	14.7	10%^	11.0		
TOTAL			11.0	3.0	0.2

^ $14.7ha \times 7.5ML/ha \times 10\% = 11.0ML$

Project Budget:

Project costs have been based quotes provided by 

Irrigation Design:

Irrigation designs have been completed by a certified designer for the irrigation system and has been 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.