Government of South Australia
Department for Environment and Water

SOUTH AUSTRALIA - ADDITIONAL EFFICIENCY MEASURES CRITERIA ASSESSMENT OUTCOME

Project Reference No:	314639
Outcome:	Compliant with the Efficiency Measures assessment
Date recommended to proceed to public comment	4 June 2021
Date recommended to proceed to the Australian Government's detailed assessment stage	25 June 2021

Overview

The project involves a major overhaul of the existing irrigation system on a 59.0ha mixed planting horticultural/viticultural property located at Loxton North in the Riverland SA, much of the system and plantings are at the end of their productive life and are in need of replacement or refurbishment.

The project plans to improve the delivery and distribution of water to the property by replacing old AC mainline with PVC in some areas and at the same time upgrade the primary filtration system removing constraints, leading to an overall increase in system capacity and delivery.

The conversion of old overhead and under vine sprinkler to drip irrigation and the replacement of failing drip tube will greatly increase water use efficiency and when coupled with a new remote access automation system and 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 and apply irrigation to meet the specific crop demands.

Sections of the property will be replanted at the same time that the new irrigation system is installed these plantings along with the new system will make the property more profitable and resilient to changes in climate and markets through efficiency and diversification.

A conservative water saving of 58.8ML, or 0.92ML/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 58.8 ML to the environment, with the applicant retaining 46.85 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)
Primary filtration upgrade	59.0	0.2	11.8	58.8
Mainline Upgrade	59.0	0.1	5.9	
Soil Moisture Monitoring	59.0	0.5	29.5	
Under vine sprinkler to surface drip	3.2	2.0	6.4	
Overhead sprinkler to surface drip	4.5	2.5	11.25	
Existing surface drip replacement	11.3	1.0	11.3	
Automation and control	59.0	0.5	29.5	
Total Water Saving			**105.65**	

Efficiency Measures Criteria	Project Responses to Efficiency Measures Criteria	Adequate Response Y/N	State Assessment
Evidence of engagement with community, industry and government agencies during project design (Criteria 9, 6a, 6b)	6a. N/A - Private Diverter. 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. 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. 9a. Please refer to response to 6b. 9b. Please refer to response to 5b.	Y	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. The proposed project is not located within an irrigation network or trust, so the application is not required to provide evidence that the relevant network operator or water corporation is involved in or aware of the project.
Potential Direct Water Market Impacts (Criteria 7a, 7b, 7c, 7d)	7a. Attachment B to the proposal confirms that the volume of water entitlement owned	Y	The application has demonstrated that:

	and the period of ownership. (Water Licence No 22351 refers). The project has been independently assessed which included the provision of formal quotations to establish the budget for the project. This assessment confirms that only a conservative volume of the assessed 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 on-farm water use studies and investigations. 7b. Attachment B to the proposal confirms the water nominated for transfer has been held by the applicant for 3 years. (Water Licence No 22351 refers). 7c. The project works result in a conservative reduction in annual irrigation demand (105.65ML) however the proponent is only seeking to return a conservative volume (58.8ML) 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 based on best projections of future water recovery potential would represent less than		• 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 transfer more water than the project will save. • The water entitlements to be transferred have been held for a minimum of 3 years at the time of application. 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.

	0.01% of the SDL in the southern connected MDB. 7d. As this project along with all others funded through the program will generate retained savings in addition to the volume nominated for transfer it will not directly increase the price of water. The cumulative implementation of projects is expected to generate additional supply noting that only the conservative volume of water savings are transferred.		
Contribution to Proponent Businesses and Irrigation District Viability (Criteria 4a, 4b, 4c)	4a. The proponent is a private diverter for the purposes of irrigation water delivery and the proposed works will contribute to the future viability and sustainability of the business by improving the productivity and efficiency of on-farm water use. 4b. As mentioned in the response to criterion 2 this project will deliver significantly increased productivity in terms of returns per ML to the participating enterprise which will in turn facilitate increased business profitability. The modernisation works will position the business to capitalise on improved returns for wine grape and nut production in the SA Riverland. 4c. While the property is not located within an irrigation network the works are consistent with the Loxton, Media, Rilli and	Y	The application has demonstrated that: • 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 irrigation district, consistent with current business plans.

	Sherwood Land and Water Management Plan. The works are also very well aligned with irrigation efficiency objectives of the River Murray Water Allocation Plan and the SA River Murray Salinity Management policies.		
Support for Regional Economies (Criteria 5a, 5b, 5c, 5d, 6c)	5a. All works will be carried out by contractors and service providers located in the region meaning the investment will provide direct regional stimulus. The upgrades are also expected to create additional seasonal employment requirements post project which will also provide direct and indirect benefits to the local community and region more generally. 5b. Currently the property is operating inefficiently both from a water use and production perspective and the proposed works will address the current limitations with the on-farm irrigation system and the overall productivity ($/ML) of water use. The on-farm irrigation efficiency works will also assist the proponent to be better adapted to reduced and/or more volatile water availability in the future which will provide benefits at a local, network and regional scale. 5c. This project represents a long term investment in the local irrigation district. The works will increase the productive capacity of	Y	The application has demonstrated that the project will: • Support the wine grape and almond industries, which are important sectors of the Riverland and SA economy. • Maintain and potentially increase seasonal employment along with engaging local contractors during the redevelopment and construction phase. • 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. • Increase regional and Basin wide productivity through increasing the volume of water available for consumptive uses on the water market.

	the property and hence region through increased fruit and nut yields and quality all while achieving significant water savings. 5d. As outlined in 5a. due to the reconfiguration of the property the works are expected to generate additional seasonal employment while maintaining the existing level of on-going employment. The works will provide a direct injection of investment during the implementation phase and post project will support employment along the picking, packing and distribution chains. 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.		
Social and Environmental Benefits (Criteria 2a, 2b, 2c,)	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 increase in annual revenue that is derived	Y	The application has: • Described the expected socio-economic and environmental benefits of their proposed project, which include:

	from the existing irrigated crops which will assist with under-pinning the current levels of on-going and seasonal employment. All goods and services will be sourced from within the local region meaning the program investment will deliver a direct economic stimulus. 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. The project will also see the adoption of precision agriculture tools and platforms and therefore will showcase the latest innovation in irrigation management. The Riverland region is also very reliant on tourism and the associated recreation activities that the River Murray provides. This project will ensure that irrigation induced impacts on the River Murray and surrounding floodplains and wetlands are minimised and that the ecological and recreational values are maintained and enhanced. 2b. As this project is focused on on-farm works it is not expected to directly contribute to amenity values within the local community. 2c. N/A $		○ 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. • 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.
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	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

	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.		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 to 5b. 12a. As was outlined in the response to criterion 7a. the project will generate water savings in addition to the volume that is nominated for transfer. The water savings have been based on accepted industry benchmarks and published irrigation requirements and verified as part of the independent technical assessment of the proposal. The project budget has been prepared using quotations provided by reputable service providers. Project costs have been reviewed as part of the independent technical assessment. 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	Y	The application has demonstrated that the project will: • Modernise existing inefficient irrigation systems, which will position the business to capitalise on returns for wine grape and almond 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.

	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.		
Cultural Benefits **(Criteria 8a, 8b, 8c)**	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. 8b. The project will engage local contractors to deliver all works which will provide a direct economic stimulus within the local community. As the wine and nut industries are critical drivers of the regional and State economy the proposed works will ensure that	Y	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. 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.

	the economic contribution of the industry continues. This will assist with securing local and regional employment and ensure local community based sporting clubs and groups can continue to prosper into the future. 8c. N/A		

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

Through the public comment process run by the Department and published on the Have your say website, there were no comments lodged.

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.

Water Savings Substantiation – Water Efficiency Program (WEP) Technical Assessment

Project ID: [redacted]

Crop Type: Wine Grapes & Almonds

Project Summary:

The project involves a major overhaul of an existing irrigation system on a 59.0ha mixed planting horticultural/viticultural property located at [redacted] in the Riverland SA. Much of the system and plantings are at the end of their productive life and are in need of replacement, or refurbishment.

The project plans to improve the delivery and distribution of water to the property by replacing old AC mainline with PVC in some areas and at the same time upgrade the primary filtration system removing constraints, leading to an overall increase in system capacity and delivery.

The replacement of failing surface drip tube will greatly increase water use efficiency and when coupled with a new remote access automation system and 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 and apply irrigation to meet the specific crop demands.

Sections of the property will be replanted at the same time that the new irrigation system is installed these plantings along with the new system will make the property more profitable and resilient to changes in climate and markets through diversification.

A conservative water saving of 58.8ML, or ~1.0ML/ha will be generated through the project works.

Water Saving Methodology:

The system is currently operating outside of the original design specification due to tube that has deteriorated significantly over time resulting in a large number of squirting emitters. The project will install new pressure compensated surface drip irrigation to return the system back to the original design specification. Two additional patches of under vine and overhead sprinklers will be converted to surface drip irrigation however this is discussed in more detail later in the methodology.

A section of the original AC mainline is currently leaking and will only continue to deteriorate further if not replaced. The section of the mainline is also acting as a delivery constraint as it is prone to blow-outs meaning the system is operated conservatively and therefore lacks the capacity to meet peak crop water requirements. The new mainline will generate water savings by eliminating water losses via blow-outs and through increasing delivery capacity which will assist with irrigation scheduling.

The primary filtration system will also be upgraded at the property with the new automatic system expected to deliver a water saving as a result of more efficient back flushing operations as well as enabling an increase in the water delivery capacity through the filtration system which will in turn provide efficiencies with scheduling irrigations. Automatic back-up field filters will also be installed as part of the project which will provide additional system management and maintenance benefits.

[redacted]

A remote access control and automation system that will send alerts will allow the applicant to manage the system more efficiently and accurately monitor water use preventing over-irrigation, while protecting the plantings during extreme weather events. The automation and control will be an important management tool given the diversity in crop types and variations in the age and variety within crops.

The installation of continuous logging, web based soil moisture monitoring system will provide real time information to optimise irrigation decision making and will be an important validation tool to ensure irrigation scheduling maximises the productivity and efficiency of on-fam water use.

The automation, control and monitoring components of the project will be particularly beneficial as the site will be managed as part of a portfolio of properties within the Riverland irrigation region and therefore having the ability to access data remotely will ensure on-farm water management is as efficient as possible.

Sections of the property will be redeveloped^ at the same time as the irrigation upgrades and new vines will be planted on drought and salt tolerant Paulsen rootstocks. While no allowance has been made for the potential to generate water savings through the adoption of drought and salt tolerant rootstocks, irrigation and production data sourced from the Riverland wine grape growing region indicate savings of up to 1.0ML/ha are achievable without suffering any yield penalty. Two patches of redeveloped vines will involve concurrently converting the irrigation system from under vine and overhead sprinklers to surface drip and this has been captured in the water savings summary table below. Water savings ranging from 2.0-2.5ML/ha are expected to be achieved through these conversions consistent with crop and system type benchmarking data.

^ *While significant areas of the property will be redeveloped concurrently with the project only the components associated with existing and retained plantings have been included in the water savings calculation.*

Water Saving Activity	**Area (ha)**	**Water Saving (ML/ha)**	**Total Water Saving (ML)**	**Conservative Saving (ML)**	**Conservative Saving (ML/ha)**
Primary Filtration Upgrade	59.0	0.2	11.8		
Mainline Upgrade	59.0	0.1	5.9		
Soil Moisture Monitoring (New)	59.0	0.5	29.5		
Under Vine Sprinkler to Surface Drip	3.2	2.0	6.4		
Overhead Sprinkler to Surface Drip	4.5	2.5	11.25		
Existing Surface Drip Replacement	11.3	1.0	11.3		
Automation and Control	59.0	0.5	29.5		
		TOTAL	**105.65**	**58.8**	**1.0**

Project Budget:

Project costs have been based quotes provided [redacted]

[redacted]

Irrigation Design:

An Irrigation Design has been completed by a certified designer for the irrigation system and has been included as an attachment 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.

[redacted]

[redacted]

1 PROJECT DETAILS:

CID Name:	[redacted]	**Date:**	2/02/2021
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.

[redacted]

Certified Irrigation Designer

[redacted]