



SOUTH AUSTRALIA - ADDITIONAL EFFICIENCY MEASURES CRITERIA ASSESSMENT OUTCOME

Project Reference No:	793278
Outcome:	Compliant with the Efficiency Measures assessment
Date recommended to proceed to public comment	15 September 2020
Date recommended to proceed to the Australian Government's detailed assessment stage	19 March 2021

Overview

The applicant is seeking to undertake irrigation modernisation works across two citrus properties totalling 15.3ha located near Loxton in the SA Riverland region.

The primary water savings for the project will be generated through the conversion of old and inefficient under-tree sprinkler irrigation to surface drip irrigation and replacing existing old and under-performing surface drip irrigation. Other upgrades to be undertaken as part of the project will include the upgrade of primary and secondary filtration which will support the optimised operation of the new surface drip irrigation. A replacement pump and filtration shed will be installed on a third 7.5ha citrus property.

The upgrades will reduce the volumes (ML/ha) of water being applied to the crops without any yield or quality penalties meaning the profitability per ML applied will increase. The property currently supports seasonal employment via on-farm fruit picking which in turn generates further employment along the fruit packing and distribution networks and as such is an important contributor to the local, regional and State economies.

Water savings in addition to the volume nominated for transfer will be generated through the project works which will assist the family owned and operated business to better adapt to periods of reduced water availability in the future. The works will also reduce the properties on-going annual water requirement through the efficiencies that are achieved meaning there will be a net positive impact on the consumptive pool of water available for irrigated agriculture.

The works will also ensure irrigation applications best meet crop water requirements meaning there is less water draining below the crop rootzone and needing to be disposed of through regional drainage networks. This will have a positive impact on the health and ecological values of local floodplains and wetlands and the River Murray more generally which will assist local eco-tourism and recreational pursuits.

A conservative water saving of 8.4ML, or 0.53ML/ha is nominated for the proposal.

Part 1 - State Assessment - Efficiency Measures criteria

Assessment Approach

This 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 primary water saving activity included in the project is the conversion of a total of 4.6ha of existing old and inefficient under-tree sprinklers to surface drip irrigation. Consistent with water savings benchmarks for these types of activities and crop type a water saving of up to 2.0ML is expected to be achieved from the conversion to surface drip irrigation from under-tree sprinkler irrigation. Both areas that are to be converted to surface drip irrigation will also have automatic field filters installed to suit the new drip irrigation which is expected to deliver additional system operating efficiencies.

A small area of existing but under-performing surface drip irrigation will also be replaced as part of the project which is expected to deliver a water saving of 1.0ML/ha consistent with the documents referenced above.

An upgrade of the primary filtration across 8.9ha of citrus will also be completed as part of the project. The upgrade will involve the installation of an automatic flushing filter which is expected to generate a small water saving compared to the existing manually operated filtration system. Currently the filtration unit is flushed regularly as a precaution however the new system will be operated by differential pressure meaning flushing will only occur as required. A small water saving of up to 0.2ML/ha is expected to be generated through the installation of the automatic primary filtration unit.

The project is expected to return a conservative 8.4 ML to the environment, with the applicant retaining 5.1 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)
Under-Tree Sprinkler – Surface Drip Conversion (Home 3.4ha & Fogden 1.23ha)	4.6	2.0	9.2	8.4
Surface Drip Replacement (Fogden)	2.5	1.0	2.5	
Primary Filtration Upgrade (Fogden)	8.9	0.2	1.8	
Total Water Saving			13.5	

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)	<p>9. Please refer to responses 5b and 6b.</p> <p>6a. Please refer to Attached – attached Central Irrigation Trust – Information Statement.</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.</p> <p>Direct engagement with industry and commodity groups, irrigation infrastructure operators, Local Government, Regional Development organisations has occurred on the program.</p> <p>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>	Y	<p>The application has demonstrated that the delivery partner has consulted with relevant industry bodies, 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 - Central Irrigation Trust, is involved in or aware of the project.</p>
Potential Direct Water Market Impacts (Criteria 7a, 7b, 7c, 7d)	<p>7a. Please refer to Attached - Water Access Entitlement confirming that the volume of water entitlement owned and the period of ownership.</p> <p>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</p>	Y	<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 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.

	<p>that additional savings will be retained by the proponent.</p> <p>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.</p> <p>7b. The attached - Water Access Entitlement verifies that the nominated water entitlements meet the 3 year ownership requirement.</p> <p>7c. The project works result in a reduction in annual irrigation demand (13.5ML) however the proponent is only seeking to return a conservative volume (8.4ML) of the assessed saving 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 very 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 returned will not directly increase the price of water.</p>		<ul style="list-style-type: none"> 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 will put downward pressure on water market prices.
Contribution to Proponent Businesses and Irrigation District Viability (Criteria 4a, 4b, 4c)	<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</p>	Y	<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 citrus production in the SA Riverland.

	<p>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 IIO.</p> <p>4b. As mentioned above all properties where works are proposed are located within the Central Irrigation Trust (Loxton). The Loxton Irrigation District is one the larger irrigation supply districts within the CIT footprint and as such the network will continue to be used well into the future.</p> <p>4c. As has been discussed in both 4a. and 4b. the works are proposed to occur on properties located in the Loxton Irrigation Trust which is operated by the Central Irrigation Trust (CIT). CIT has invested significantly in the Loxton Irrigation Trust in recent years confirming their commitment to the trust into the future which will be underpinned by viable and adaptable irrigation properties which the proposed works will enable.</p>		<ul style="list-style-type: none"> The project will contribute to the longer term viability of the properties which will provide benefits across the irrigation district and the trust more broadly which is consistent with current business plans.
Support for Regional Economies (Criteria 5a, 5b, 5c, 5d, 6c)	<p>5a. As was referred to in the response to 2a. all goods and services for this project will be sourced from local contractors and suppliers. As the property is predominantly citrus it supports significant seasonal employment during picking season which also contributes to indirect employment along the packing and fruit distribution networks.</p> <p>5b. This proposal is very well aligned to industry, network/system and local/regional priorities given it enables best practice irrigation management to be adopted while maintaining and enhancing productivity.</p>	Y	<p>The application has demonstrated that the project will:</p> <ul style="list-style-type: none"> Support the citrus industry which is an important sector of the Riverland and SA State economy. Increase water use efficiency in ways that align with current strategic plans developed by Citrus Australia for the ongoing prosperity of growers maximising returns, developing markets, protection of production through biosecurity, using resources responsibility and respecting the environment. Increase the overall productive capacity of the

	<p>5c. As was described in criteria 4 the properties where works are proposed are all serviced by the Central Irrigation Trust. The trust districts are all fully piped and no reduction in water delivery rights will occur as a result of the project. The works will ensure the properties are viable into the future which is a positive outcome for the trust and its members.</p> <p>5d. As addressed in 5a. the expectation is that additional regional jobs will be created as a result of this project as the productivity of the orchard will improve which will require additional seasonal employment. The works will not result in any reduction to existing on-going employment on the farms themselves.</p> <p>6c. While this project will deliver significant positive benefits to the proponent these benefits will extend beyond the farm gate through investment in the local community both for the project works and in the longer term.</p> <p>The project will also deliver a volume of retained savings for the proponent which will assist to increase water supply at a local, regional and Basin scale.</p>		<p>Riverland region and Riverland citrus industry by contributing to industry support programs such as local research, development, extension and adoption activities.</p> <ul style="list-style-type: none"> • Lead to an increase in 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 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.
Social and Environmental Benefits (Criteria 2a, 2b, 2c)	<p>2a. This proposal is seeking to undertake integrated irrigation upgrades on a family owned and operated citrus business located in the SA Riverland region. The project works will deliver real water savings and secure the existing levels of both full time and seasonal employment that the business supports.</p> <p>All works will be undertaken by contractors</p>	Y	<p>The application has:</p> <ul style="list-style-type: none"> • Described the expected socio-economic and environmental benefits of their proposed project which include: <ul style="list-style-type: none"> ○ Increased productivity in terms of return per ML for the business and region. ○ Improving the business's long term

	<p>based in the local community and region meaning the program investment will provide direct economic stimulus to the community and region.</p> <p>The works will improve the productivity of on-farm water use and will ensure the environmental impacts of irrigation practices are minimised.</p> <p>The works will also generate water savings in addition to the volume nominated for transfer and therefore will increase seasonal water supply into the consumptive pool.</p> <p>2b. As this project is small scale and focused on on-farm upgrades only there will not be direct impacts on social values such those community assets described in this criterion.</p> <p>2c. N/A</p>		<p>resilience and viability which will have flow on benefits to the local, regional and State economies.</p> <ul style="list-style-type: none"> ○ 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 to local communities of weirs, storages and parks. Accordingly, 2b is not applicable. <p>The project is below the \$4 million threshold for large projects and is not required to address criteria 2c.</p>
Work health and safety laws (Criteria 2d)	<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.</p> <p>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 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>
Business Resilience, including Drought and Climate Change Impacts (Criteria 10a, 13a, 12a)	<p>10a. Please refer to response to 5b.</p> <p>13a. As has been described in previous</p>	Y	<p>The application has demonstrated that the project will:</p>

	<p>criteria the project is projected to generate real and lasting water savings of which only approximately 62% is nominated for return. This will leave the balance of the savings to be retained and this will assist the proponent to better manage climate variability especially where this results in reductions in water availability in dry seasons.</p> <p>Additionally when seasonal irrigation allocations are high or maximised the proponent will have surplus water that can be made available into allocation markets which will provide an additional revenue stream and broader flow-on benefits with respect to water supply in the SMDB.</p> <p>12a. As described in 7a. the project will deliver more water savings than the volume that is nominated for transfer.</p> <p>The project works budget has been based on formal quotations from service providers and these costs have been reviewed as part of the independent assessment process.</p>		<ul style="list-style-type: none"> • Increase water use efficiency in ways that address strategic plans developed by Citrus Australia for the ongoing prosperity of growers maximising returns, developing markets, protection of production through biosecurity, using resources responsibility and respecting the environment. • Address under-performing irrigation areas which will allow water to be used as efficiently as possible while maximising output (yield). • Generate additional water savings that will be retained by the applicant to improve the capacity of the proponent 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.
Cultural Benefits (Criteria 8a, 8b, 8c)	<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.</p> <p>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 irrigated agriculture sector.</p> <p>8b. As described in Criteria 2a. all works associated with the project will be</p>	Y	<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>undertaken by local contractors meaning the investment will remain in the local community and region.</p> <p>The works will increase productivity of the orchard which will have positive outcomes on seasonal employment and also extend along the supply chain e.g. packing sheds and distribution.</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>Any project that decreases the total pool available to food production results in negative outcomes as there will simply be less water available for agriculture.</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>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, proponents of all on farm projects in South Australia under the efficiency measures program have retained a portion (ranging from 12 percent to 89 percent) of the water savings with this 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>On-farm efficiency measures are creating upward pressure on water prices as reported in independent research completed by ABARES and Aither and do not meet principle 7d – Projects must not directly increase the price of water.</p>	<p>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.</p> <p>The ABARE report draws heavily on a recent study undertaken by ABARES, available at</p>

<p>Independent research over a number of years, most recently from the University of Adelaide, has demonstrated that irrigators who participate in on-farm projects are highly likely to purchase additional water following the implementation of the project and the resulting increase in enterprise profitability.</p>	<p>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.</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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<p>The application does not provide details of how it will impact the irrigation network, nor does it provide details of the local and regional plans for the area and how the project aligns with relevant objectives.</p>	<p>These criteria have been addressed in various places in the application and the proponent has demonstrated that their proposed project will:</p> <ul style="list-style-type: none"> • Increase productivity in terms of return per ML for the business and region. • Improve the business's long term resilience and viability which will have flow on benefits to the local, regional and State economies. • Source 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. <p>The application has also provided evidence that the relevant network operator is involved in or aware of the project.</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:	15/07/2020
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:

- 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.



Water Savings Substantiation – Water Efficiency Program (WEP)

Technical Assessment

██████████

Crop Type: Citrus

Project Summary:

The applicant is seeking to undertake irrigation modernisation works on two citrus properties located near ████████ in the SA Riverland region. The upgrades will include works to primary and secondary filtration, the conversion of existing under-tree sprinklers to surface drip irrigation and the replacement of existing surface drip irrigation. A replacement pump and filter shed will be installed on a third property.

A conservative water saving of 8.4ML, or 0.53ML/ha is nominated for the proposal.

Water Saving Methodology:

The primary water saving activity included in the project is the conversion of a total of 4.6ha of existing old and inefficient under-tree sprinklers to surface drip irrigation. Consistent with water savings benchmarks for these types of activities and crop type (Refer: *Crop Water Use by System Type-Riverland SA and OFIEP Round Four Fact Sheet*) a water saving of up to 2.0ML is expected to be achieved from the conversion to surface drip irrigation from under-tree sprinkler irrigation. Both areas that are to be converted to surface drip irrigation will also have automatic field filters installed to suit the new drip irrigation which is expected to deliver additional system operating efficiencies.

A small area of existing but under-performing surface drip irrigation will also be replaced as part of the project which is expected to deliver a water saving of 1.0ML/ha consistent with the documents referenced above.

An upgrade of the primary filtration across 8.9ha of citrus will also be completed as part of the project. The upgrade will involve the installation of an automatic flushing filter which is expected to generate a small water saving compared to the existing manually operated filtration system. Currently the filtration unit is flushed regularly as a precaution however the new system will be operated by differential pressure meaning flushing will only occur as required. A small water saving of up to 0.2ML/ha is expected to be generated through the installation of the automatic primary filtration unit.

Drainage works will also be undertaken on one property however as it will be connected into the irrigation trust drainage network no water saving has been assigned to these works but improvements in productivity will be achieved.

A summary of the water savings is included in the following table.

Water Saving Activity	Area (ha)	Water Saving (ML/ha)	Total Water Saving (ML)	Conservative Water Saving (ML)	Conservative Water Saving (ML/ha)
Under-Tree Sprinkler – Surface Drip Conversion [REDACTED]	4.6	2.0	9.2	8.4	0.53
Surface Drip Replacement [REDACTED]	2.5	1.0	2.5		
Primary Filtration Upgrade [REDACTED]	8.9	0.2	1.8		
TOTAL			13.5		

Project Budget:

Project costs have been based quotes provided by [REDACTED]
[REDACTED]

Irrigation Design:

Irrigation designs have been completed by a certified designer and copies have been included as an attachment to the application.

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.
