

The Achievements of Murrumbidgee Irrigation Under Round 2 of the Private Irrigation Infrastructure Operators Program in NSW



Final Project Report March 2020

MURRUMBIDGEE IRRIGATION LIMITED

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Document Authorisation

Name	Signature	Date
Approved by:		2 April 2020
Jody Rudd		
GM ASSET DELIVERY		

Abbreviations and Acronyms

AMS	Activity Method Statement	MIA	Murrumbidgee Irrigation Area
СЕМР	Construction Environment Management	MIARA	MIA Renewal Alliance
	Plan	NBC	Northern Branch Canal
DAWR	Department of Agriculture and Water	PIIOP	Private Irrigation Infrastructure
	Resources		Operators' Program
DoV	Deed of Variation		
EOI	Expression of Interest	PVC	Polymerizing vinyl chloride
EP&A	Environmental Planning and Assessment	PPE	Personal Protective Equipment
EPBCA	Environment Protection and Biodiversity	RCP	Reinforced concrete pipe
	Conservation Act	REF	Review of Environmental Factors
GHD	Gutteridge Haskins and Davey	RFT	Request for Tender
GRP	Glass fibre Reinforced Plastic	SWMS	Safe Work Method Statement
HDPE	High Density Poly Ethelene	тос	Total Outturn Cost
HSEQ	Health Safety Environment Quality		
IMS	Integrated Management System	TRA	Task Risk Assessment
IP	Injured Person	TSCA	Threatened Species Conservation Act
КРІ	Key Performance Indicator	WHS	Work Health & Safety
ІТТ	Invitation to Tender	WHSMS	Work Health Safety Management
LTI	Lost Time Injury		System
LTAAY	Long Term Average Annual Yield		
LVBC	Lake View Branch Canal	WRA	Work Risk Assessment
мі	Murrumbidgee Irrigation Ltd		

1. Introduction

Murrumbidgee Irrigation (MI) is pleased to submit this final report in accordance with Milestone 14 of the Funding Agreement with the Department of Agriculture and Water Resources (DAWR). The report summarises project activities since funding approval was granted in 2013 through to project completion including:

- funding agreement and relevant variations;
- preparatory planning;
- challenges encountered during project delivery;
- new assets delivered;
- systemic changes arising from the investment;
- overall benefits to MI, customers and the local community; and
- project expenditure.

Funding in the amount of \$172,971,708 enabled MI to ensure the future sustainability of the Wah Wah Stock and Domestic area, fast-track automation of the water delivery system along with asset refurbishment works that have delivered major operational efficiencies within the business and productivity gains for our customers. Such investment led to the most extensive works program within the Murrumbidgee Irrigation Area (MIA) since the area was constructed in the early 1900's. The investment has therefore reinforced the position of the MIA as one of the premier irrigation areas within Australia.



Wah Wah Stock and Domestic Pipeline Project

2. The Funding Agreement

2.1 Initial Funding

Executed May 2013 \$149,622,911 32,996ML to be transferred Initial projects:

- Wah Wah Stock and domestic scheme
- Bilbul Mixed Use Area System Automation
- Northern Branch Canal and Yenda 4 Horticultural Modernisation
- Hanwood Horticultural Modernisation
- Yenda 1 Horticultural Modernisation
- Yenda 5 & 6 Horticultural Modernisation
- Leeton Zones Horticultural Modernisation

2.2 Deed of Variation #1

The first variation was executed in May 2014. The key changes apart from general administrative and legislative updates included:

- Renaming and grouping of like projects
 - \circ Wah Wah Stock and domestic scheme to Wah Wah Stock and Domestic Pipeline
 - o Bilbul Mixed Use Area System Automation to Bilbul Modernisation Project
 - Northern Branch Canal and Yenda 4 Horticultural Modernisation to Northern Branch Canal Modernisation Project
 - Yenda 1 and Yenda 5 & 6 Horticultural Modernisation combined as Yenda Modernisation Project
 - Leeton Zones Horticultural Modernisation to Leeton Modernisation Project.
- Amendments to milestone dates and corresponding payments.
- Amendments to "On-Farm Works Eligible Activities" to include 'Earthworks to fill decommissioned channels' and 'Removal of structures related to decommissioned channels.

2.3 Deed of Variation #2

The second variation was executed in April 2015. The key changes apart from general administrative and legislative updates included:

- Further grouping of projects namely combining Northern Brach Canal Modernisation project and Yenda Modernisation Project and renaming Northern Branch Canal/Yenda Modernisation Project.
- Activity period being extended from February 2018 to December 2018
- Water to be transferred increased from 32,996 ML to 33,611 ML comprised of 3,418 ML GS, 23,100ML Conveyance and 7,083ML HS

2.4 Deed of Variation #3

The third variation was executed in October 2015. The key changes apart from general administrative and legislative updates included:

- Further grouping of projects. Now Wah Wah Stock and Domestic Pipeline, Murrumbidgee Irrigation Area Modernisation Works and Hanwood Modernisation Project.

2.5 Deed of Variation #4

The fourth variation was executed in November 2016. The key changes apart from general administrative and legislative updates included;

- Activity period extended to June 2019
- Water to be transferred now 38,140 ML (comprising of 16,935 ML GS, 18,748 ML Conveyance, 1,654 HS, 803 ML Murray GS) and 6,650 LTAAY of gap-bridging Murrumbidgee High security and General Security Water Access Entitlements only, from eligible proponents receiving funding for tranche 2 of the on-farm works.
- Funding granted to include \$25.5M for on-farm works. Total finding for activity now \$175,122,911.

2.6 Deed of Variation #5

The fifth variation was executed in November 2019. The key changes apart from general administrative and legislative updates included;

- Activity period extended to February 2020
- Water to be transferred 38,140 ML (comprising of 16,935 GS, 18,748 Conveyance, 1,654 HS, 803 Murray GS) and 6,089 LTAAY of gap-bridging Murrumbidgee High security and General Security Water Access Entitlements only, from eligible proponents receiving funding for tranche 2 of the on-farm works.
- Funding for activity now \$172,971,708

3. Planning

The PIIOP2 funding application followed the success of the earlier application under PIIOP1. It was submitted in July 2011 at a time when PIIOP1 works were starting delivery. MI therefore had the advantage of the experience gained from the planning of the earlier funding round including:

- similar scope in terms of channel automation, channel lining and pipeline projects;
- experience scoping and costing large-scale work programs;
- pre-existing concept designs and standard drawings;
- lessons learnt to improve project outcomes; and
- access to expertise within the Murrumbidgee Irrigation Area Renewal Alliance (MIARA) which was specifically established to deliver the PIIOP works.

The scope for PIIOP2 included projects that addressed the efficient delivery of stock and domestic water supply to remote areas, site-specific refurbishment needs as well as large scale works that systematically modernised entire irrigation districts. The large scale of works meant that initial scoping for the purposes of the funding application included assumptions that required later validation and refinement.

The program of works commenced in 2013 under the management of MIARA, the established contract alliance between MI, John Holland, GHD and UGL, except for the Wah Wah Stock and Domestic Pipeline project and the On-farm project which were managed by MI directly.



New automated regulators (RC-2-775) on the Northern Branch Canal

MIARA's initial focus was on the delivery of the Hanwood Modernisation Project which began in April 2014 and was followed by the Murrumbidgee Irrigation Area Modernisation project. All projects required MIARA to provide a business case review as part of the planning process for all projects. The reviews resulted in further clarification of project scope and in some cases large scale scope changes whereby alternatives demonstrated greater value for money in terms of operational efficiencies and service levels for customers. Scope changes included the introduction of channel lining products, remote monitoring of meters in remote areas and an increase in structures to be automated.



Newly installed EPDM lining and automated offtake in Lateral 85 Yenda

The inclusion of remote monitoring of meters across the MI network allowed the scope for the Onfarm project to be broadened to include areas outside of the original modernisation zones as per the original agreement. This change created the opportunity for all customers across the network to participate in the On-farm project that was designed to integrate with off-farm modernisation works.



On-farm drip irrigation that replaced flood irrigation on mature grape vines.

Project delivery continued under MIARA alliance until mid-2019 except for the Yanco Stock and Domestic water supply project which was self-managed by MI from 2018. MIARA delivered several automation projects, channel rehabilitation, automation of escapes, initial work on the outlets project and part of the Yanco Stock and Domestic water supply project.

4. Project Overview

The following table provides a concise description of each sub-project as listed in the amended Funding Deed.

Table 1: Summary	ble 1: Summary of Projects Delivered by PIIOP 2				
Project	Description of Works	# Assets Delivered / Refurbished	Works Program	Innovations	Specific Challenges
Wah Wah Stock and Domestic Pipeline	 Replacing an open channel system and inground dams with pressurised pipelines 	 Gunbar Water Pipeline: 273.7 km pipelines from DN300 to DN50 a pumping station on the Murrumbidg ee River a booster pumping station 42 metered farm outlets 13 stock watering points along Riverina Local Land Services stock routes 6 Private Bores & Pipelines 5 Private Pump & Pipelines 	 Initiated in May 2013 Completion 21 December 2019 	 The Aboriginal Heritage Impact Permit required an archaeological study be undertaken. An extensive subsurface testing excavation program was undertaken within the approved development corridor to establish the true nature and extent of archaeological deposits in the study area and provide an opportunity to not only salvage and relocate artefacts but also to increase our understanding of the ways in which Aboriginal people were using this landscape in the past 	 Pipeline designed outside the approved AHIP corridor resulting in delays in additional approvals. Delays during early planning due to staffing changes, inconsistent messaging to proponents, unclear procedures and agreements with some proponents not being documented The contractor's scope of works should have included a boundary survey

Table 1: Summary of Projects Delivered by PIIOP3 (continued)					
Project	Description of Works	# Assets Delivered /	Works Program	Innovations	Specific Challenges
		Refurbished			
Murrumbidgee Irrigation Area Modernisation Works	 Conversion of the Northern Branch Canal to an automated channel control system Automation Mirrool Creek Branch Canal regulators Automation of escapes, regulators and offtakes Replacement of regulators and offtake with manually operated gates Replacement of concrete channels with gravity pipelines Replacement of access bridges across the Northern Branch Canal 	 The automation of 154 regulating structures Replacement of 121 Dethridge Outlets with Electromagnetic Meters Upgrade of 156 Doppler Meters to Electromagnetic Meters and Real Time Monitoring 4km of concrete channels relined with EPDM lining 6km of pipelines to replace open channels Upgrade and automation of 71 Escapes Upgrade and automation of 33 Offtakes Rationalisation of 208 water regulating structures and outlets 	 Initiated 7 April 2016 Completion 6 October 2017 	 Change in structural design requirements to match current operations- precast automation structures over cast in-situ Reviewing the pedestal bases to a push in style over in-situ Use of EPDM Lining in damaged concrete lined channels reducing demolition and earthworks costs and limiting supply interruption 	 Isolation points not enough and could have been combined with temporary transition structures Document control Late procurement meant rushed changes to design.

Table 1: Summary of Projects Delivered by PIIOP3 (continued)					
Project	Description of Works	# Assets Delivered / Refurbished	Works Program	Innovations	Specific Challenges
Murrumbidgee Irrigation Area Modernisation Works <i>(Continued)</i>	 Replacement of Dethridge wheels with electromagnetic flow meters Installation of real time telemetry units and slow time telemetry units on metered outlets Installation of radio telemetry units on escapes and regulators On-farm works to complement delivery system improvements, including tranche 2 of the on-farm works Sufficient number of proponents to 				

Table 1: Summary of	Table 1: Summary of Projects Delivered by PIIOP3 (continued)					
Project	Description of Works	# Assets Delivered / Refurbished	Works Program	Innovations	Specific Challenges	
Murrumbidgee Irrigation Area Modernisation Works (Continued) Hanwood Modernisation Project	 deliver the water entitlements to the Commonwealth as set out in the Milestone Schedule. Replacement of earth and concrete lined channels, with gravity pipelines Replacement of regulating structures Upgrade of manually operated gravity channel to an automated channel control system Installation of new electromagnetic 	 Replacement of 13.5km Concrete lined channels with gravity pipelines Rehabilitation of 1.1km deteriorated concrete lined channels Replacement of approx. 67 dethridge wheels and doppler meters with flow meters 	 Initiated 4 April 2014 Completed 19 September 2015 	 Change Lateral 1,5,14 from shotcrete channel to pipelines saving on maintenance costs Increase Lateral 6 by 243m to decrease approximately 3km of pipeline size saving on cost Mirrool Creek hardware trial to ascertain the level of performance from the existing type of gates Reviewing the pedestal bases to a push in style over in-situ 	 MI & Alliance Management changes Delays due to inaccurate data relating to size, location and type of outlets 	
	electromagnetic flow meters	 Installation of approx. 10 unmetered pipe outlets Modification of 4 doppler meter outlets in existing 				

pipelines with
remote
monitoring
capability
Fitting of approx.
188 metered
outlets with
remote
monitoring
capability
Replacement of 9
regulators and
minor repairs to
23 regulator
structures
Removal of
approx. 14.6km
decommissioned
concrete lines
channels and
back fill to restore
the ground
profile
Removal of 14
access bridges
and 6 pedestrian
walkways.

Project	Description of Works	# Assets Delivered /	Works Program	Innovations	Specific Challenges
		Refurbished			
Hanwood Modernisation Project <i>(Continued)</i>	 On-farm works to complement delivery system improvements Sufficient number of proponents to deliver the water entitlements to the Commonwealth as set out in the Milestone Schedule 				

5. Planning and delivery Challenges that were overcome

The PIIOP2 work program was an ambitious program with a large scale of works to be delivered in a short timeframe. The following section outlines the higher-level challenges that were overcome to deliver the works.

5.1 General

5.1.1 Accurately Scoping Projects

Asset data base

MI has a large number of water regulating assets that have been designed, constructed, modified and removed over the past 100 years. Due to several changes to records systems over that time, the MI asset data base was found to be unreliable in that not all assets were listed consistently, or dimensions accurately recorded. In addition, asset condition had declined over time and some of these defects were not identified until channels were drained and works commenced.

Because of the inconsistencies in the asset data there was an emphasis on field reconnaissance and survey during the planning stages where possible. Despite these efforts, assumptions and estimates were used when initially scoping some projects. Any remaining uncertainty at the time of tender was reflected in tender documents. This increased the perceived risk to contractors resulting in a reduced number of tenders and higher than expected tender prices.

As a result of this learning, a high priority has been placed on ensuring all new assets are accurately documented and captured in the MI asset management system at the completion of each project. Additionally, project programs need to include thorough investigation of all infrastructure that can only be achieved through the draining of channels for inspection of all associated assets. This can only be achieved in the winter period when demand for water is at its lowest and an allowance for more time to the planning process needs to be considered.

Water savings estimation

A conservative approach has been adopted for estimating the water savings generated by the program of works. This approach was necessary because not all project sites had accurate monitoring capabilities. Where sites historically relied on visual flow estimation or hydrometric data that was taken at a certain point in time (and therefore subject to variability due to channel degradation, sedimentation or weed growth), savings estimates were based on similar sites with accurate monitoring capabilities.

Post program implementation, accurate flow measurement is now available at hundreds of new sites. With the completion of channel tuning in December 2019, initial data is available and supports the magnitude of water savings estimates. Further confirmation will follow as more of data is collected.

5.1.2 Access to Skilled Staff and Contractors to Manage and Deliver the Works

Delivering such a large program of works in short timeframes was identified very early in the PIIOP era as a risk to successful delivery. An Alliance contract model was adopted for the delivery of the majority of the works in part due to the selected partners capability to provide resources with the appropriate skills required to successfully deliver the projects.

Whilst mostly successful, attracting the appropriate workforce was challenging. Challenges included the release of substantial funding by the Commonwealth and the State governments for major civil works programs under way in capital cities, water efficiency works programs in other irrigation areas and one-off projects such as the Wentworth to Broken Hill pipeline project competing for the same resource base.

Tier one contractors such as John Holland can readily source skilled staff due to the ongoing work opportunity they can provide. They also have an extensive experience pool across Australia. Alliance partners were successful in bids for other works outside MI's Program and whilst resources were provided, these were predominately staff that were new to the respective businesses and therefore took time to transition over to working under John Holland systems.

5.1.3 Works Scheduled During a Very Short Winter Shut-Down Period

MI historically suspends the supply of water over winter to permit maintenance and minor construction activity. The winter shut-down coincides with a low water use period and generally applies from the last week of May through to the first week of August. This is a very short window of only 9-10 weeks to undertake the PIIOP2 works, much of which could only be achieved with a full shut-down of multiple laterals.

Contractors had to be secured, inducted and then mobilised in advance of the planned shut-down. The nominated channels had to be drained to permit works to be undertaken at the scheduled time and then refilled at the end of the shut-down period to allow customers to recommence irrigation. This substantially increased the workload on MI field staff.

Management of a channel shut-down is further complicated if customers such as citrus growers request a winter watering to manage frost risk. Such a request will arise if several days of less than 0°C are anticipated, particularly if temperatures drop below -2°C. Such occurrences can only be predicted a few days in advance which increases the tension for customers, MI customer engagement staff, MI water delivery staff and MIARA. In some cases, MI intentionally retained water in specified channels to help manage this risk.

The challenge was overcome through detailed planning, effective resourcing, good coordination, and the extensive use of engagement teams for communication. Construction teams also took the opportunity to develop techniques enabling them to carry out in-season works for smaller projects.

5.1.4 Adherence to WHS Requirements and Expectations

Our high priority on safety is reflected in policy, project planning documentation and construction delivery. The scale of PIIOP2 works presented challenges in maintaining adherence to WHS requirements due to a very large works footprint, remote locations and the need to induct large numbers of new employees and contractors.

Pleasingly there were no lost time injuries experienced during the delivery of PIIOP2 works. The safety data for MIARA PIIOP works is presented below in Table 2.

Table 2: PIIOP Safety Data

Classification	Number of Events
Lost Time Injury	0
Medical Treatment Injury	3
Alternate Work Injury	0

First Aid Injury	19
Near Miss Events	14

5.1.5 Change Management

5.1.5.1 Staff

The works program impacted staff from three perspectives:

- Additional staff were employed by MI and MIARA to manage the additional workload during construction. The new staff had to be inducted and familiarise themselves with MI operations, standard designs and project requirements.
- Despite the employment of additional MIARA staff, MI staff workload increased to accommodate general day-to-day operations as well as assisting with the delivery of the PIIOP capital works program. For example: the MI engineering team were required to communicate design expectations, review designs and monitor works; MI operations staff workload temporarily increased to schedule temporary shutdown of water delivery and familiarise themselves with new flow dynamics; and customer engagement staff had to manage the scheduling of works, enquiries to resize farm outlets and general customer concerns.
- Modernisation and automation delivers operational efficiencies thus reducing labour force requirements. Such works also change the required long-term skillset to operate and maintain the new assets into the future. These requirements have been discussed openly within MI for some time and staff have been engaged extensively in regard to transition strategies that are currently being implemented including retaining and retraining willing staff.

5.1.5.2 MI Customers

MI customers overwhelmingly responded to the project in a positive manner despite some short-term inconvenience for their on-farm operations from construction including:

- temporary shut-down of water supply to permit the installation of new works. Shutdowns were scheduled in consultation with customers to minimise the inconvenience and impact on crops.
- traffic management activities disrupted traffic flow on public roads or on-farm, including a small number of temporary road closures.
- fences were required to be removed and replaced in a small number of cases to permit access.
- MI also took the opportunity in several cases to permanently remove trees (sometimes intentionally planted) or other items owned by customers that were too close to MI works and in contravention of MI Development Rules.

Telemetry also provides real-time visibility of flow therefore MI operations staff can readily identify system anomalies and identify where customers are taking flow contrary to a valid water order.

A positive change-management outcome was a strong interest from customers to increase the capacity of their farm outlets thereby increasing flow rate on-farm. This outcome is a response to the increasing value of water and the need to irrigate broad acre crops more efficiently. The change was also supported by a revised MI pricing schedule that reflected the real cost of maintaining each asset, thus encouraging landholders to consolidate the number of current outlets if they were used infrequently.

5.2 Wah Wah

5.2.1 Scope Management

The scope for the Wah Wah Stock and Domestic Pipeline project had changed constantly during the planning and construction phase of the project. The impact to the project included delays that required time extensions and budget impacts due to redesign and procurement during construction. Key issues affecting scope included:

- Customer work plans changing, affecting supply point locations and supply requirements in general;
- Customers inability to make decisions on individual work plans within the timeframe of the project;
- Customers desire to stay with the gravity system and resisting the change to the new modernised network; and
- Planning requirements following detailed cultural heritage surveys.

5.2.2 Geotechnical Investigation

No detailed geotechnical investigation was undertaken prior to inviting tenders for a design and construct contract. As a result, the preferred tenderer qualified their tender by saying that imported bedding was not required but offered a rate per metre for this in their submission should it be required. An allowance in the budget was made for imported bedding if required and the contract was awarded by accepting this qualification.

Significant time delay and effort was expended as the contractor was required to demonstrate the need or otherwise for pipe bedding material to comply with the relevant Australian Standard. Ultimately imported pipe bedding was directed as a variation.

6. Broader Project Outcomes

Previous sections in this report outline the physical outcomes for each sub-project. The following section focusses on the broader outcomes for each of the key stakeholder groups.

6.1 Impacts on Murrumbidgee Irrigation Ltd

Murrumbidgee Irrigation is an unlisted public company owned by the customers it services. The company operates on a cost-recovery basis. The core business of MI is to provide water supply and drainage services to around 3,200 landholdings through the irrigation infrastructure assets that it owns and operates.

A key focus of modernisation has been to increase water delivery efficiency via the progressive adoption of automated channels and farm outlets. This reflects the need to measure flow more accurately, understand real-time flow and deliver the higher flow rates that are increasingly being requested by customers. It avoids the historic practice of running channels slightly in excess of predicted demand to avoid dissatisfied customers but generating water losses via escape flows.

Likewise, the refurbishment of degraded channels and replacement of open channels with a pipeline water delivery system increases operational efficiency and improves the level of customer service.

The key benefits to MI arising from the delivery of the PIIOP2 projects are:

- An automated water delivery network that provides reliable and efficient delivery of customer orders with real time visibility thereby reducing water losses and providing greater customer confidence and flexibility.
- Hundreds of aging structures that were degraded or past their asset life have been either fully replaced or refurbished, thereby reducing operational risk arising from failures and reducing asset maintenance costs in the short term.
- Higher levels of customer satisfaction due to improved system performance and reduced operating costs.
- A safer working environment for staff through removing the manual operation of structures in remote locations and variable weather conditions.
- A modern, automated delivery network that enhances existing customer confidence, serves to attract new customers and crops and maintains the value of the historic investment in irrigation both on-farm and off-farm.

The main issues or challenges for MI going forward include:

- Maintaining the future cost pathway by realising savings in operations and maintenance to offset the higher costs associated with maintaining/upgrading automation and technology solutions. For the past 2 years annual increments in customer revenue (to cover operating costs) have been held to CPI or less.
- Operating the delivery network with a reduced conveyance allocation. The water savings calculations were intentionally conservative to counteract this impact thus leaving MI in a net better position.
- Developing and retaining a new skill-mix to operate and maintain the new technology that replaced the manually operated system.
- Ensuring systems are in place to avoid a major system failure that previously would have been identified via observation in the field. Mechanisms include system monitoring, system alarming, fail-safe modes and disaster recovery mechanisms.
- Responding to general change management issues for staff and customers.

6.2 Impact on Customers

Direct benefits to customers include:

- Access to capital through the On-farm project allows on-farm water efficiency plans to be brought forward, allowing customers to benefit from efficiency savings and assisting them to develop their businesses. By ensuring that water savings through on-farm efficiencies exceed the volume of water handed back ensures that the customer can benefit from a fully integrated modernised network and is in a net better position post project.
- The opportunity for farm reconfiguration and reduced fixed costs prompted by MI initiating discussion on options to reduce farm outlet numbers and increase outlet size at the discretion of the customer.

- Customers can now order water with a higher level of confidence that the requested flow of
 water will be available at the agreed time and for the duration of the water order. Total Channel
 Control will ensure that the water is provided at the nominated outlet and the automated outlets
 will then adjust the outlet gate settings, based on the metered flow, to maintain the desired flow
 rate despite variation in channel operating levels.
- Higher flow rates on-farm, thereby improving irrigation efficiency and generating more income per ML.
- Improved flexibility in water ordering. Customers with automated outlets can now request a water order commence or cease 24/7 rather than relying on a field operator to adjust their outlet during daylight hours.
- Reduced seepage from piped supply and lined channels. This reduces the incidence of waterlogging and the associate decline in crop yield and trafficability.
- Secure, on demand access to Stock and Domestic water needs directly from the river and bores.

Challenges for customers are largely around change management and relate specifically to building confidence in automation and the piped domestic supply system.

6.3 Regional Benefits

The regional benefits of PIIOP2 investment include:

- The works support changes to on farm practices that enable more crop/ML for the regional economy by providing higher flow rates and more responsive water delivery.
- A positive outlook for irrigation in the MIA through attracting new development such as cotton and tree crops. The diversified income base of the region provides greater economic resilience to a downturn in any particular commodity group.
- Direct expenditure in the local area. Around \$35M of project funds was paid to contractors and suppliers in the region. The most significant local expenditure items were the supply of equipment and labour hire, engineering services, sourcing clean fill material, supply of concrete and quarry materials and traffic management.
- There was also indirect expenditure in the region from the PIIOP programs (estimated to be in excess of \$20M) from staff and contractor spending on food, accommodation and leisure activities. MIARA staff and contractor numbers peaked at approximated 200 in mid-2018 and all staff resided in the local area on a temporary basis for varying durations.



Increased flowrates through larger automated outlets and remote access throughout the network

7. Review of Water Savings

A review of the water savings considers both:

- the original assessment of the projected water savings prior to project commencement; and
- a current assessment of the likely or known savings following implementation of the project.

The water savings in the 2011 funding application were conservatively estimated due to limited input data. The original assumptions have been reviewed and validated for all the listed sub-projects.

Water savings estimate validation was conducted by incorporating specific gateways into the planning process for MIARA. For example, in the MIA Modernisation project, the first gateway required MIARA to undertake a detailed review of the Yenda/NBC, Bilbul and Leeton Business Cases including the individual NPV's and stated water savings. During this review it was identified that the there was a significant risk that water savings targets were not achievable for all proposed project areas.

MIARA undertook a detailed review of the Business Cases to understand the capital cost per mega litre saved (\$/ ML). This process sought to break down the Cost Plan into channel laterals that could be directly related back to water saved on that particular channel. The direct and indirect capital cost was then allocated to each of these laterals.

The review of the \$/ML/Lateral identified that the gravity piping solutions were significantly higher cost/ML saved compared to the semi-automation solution used in the Bilbul area. The approach was subsequently revised to apply the semi-automation strategy to the other project areas with automated offtakes and escapes and to include slow time telemetry on all outlets on the Lateral. An assessment was also made of the infrastructure condition. Where the infrastructure was close to failure an allowance was made for rectification.

MI and MIARA conducted a review of water losses across the entire area of operations. The review identified systems with high escape losses that would provide value based on dollars invested per megalitre saved, operational benefits and levels of service improvements as well as potential projects that aligned with the MI Automation Strategy. These reviews resulted in a revised project

area that would achieve the targeted water savings and meet the additional weighted criteria of a positive Net Present Value, increased levels of service and improvements in safety.

The assessment of water savings following implementation is contained in the table below. It remains indicative due to the limited availability (six months) of flow data since the completion of channel tuning and the requirement for verification of flow measurement accuracy of the newly installed control structures which is ongoing. The water savings expressed in the table below refers to Conveyance Water Entitlement (in ML) for all projects except for On-farm which is recorded as LTAAY due to the different types of water entitlement that was returned.

Table 3: Projected Water Savings

Sub Project	Projected Water Savings (ML)
WAH WAH STOCK AND DOMESTIC PIPELINE	9,000
 Replacing an open channel system and in-ground dams with pressurised pipelines to supply stock and domestic water in the Wah Wah area; On-farm works to enable landholders to provide the most appropriate watering method for stock on their property including telemetry monitoring of the pipeline and on-farm watering points; and Establishment of the Gunbar Water Private Irrigation District and other pipeline systems as separate entities and refinement of the Organisation's area of operations. 	
MURRUMBIDGEE IRRIGATION AREA MODERNISATION WORKS	9,030
 Conversion of the Northern Branch Canal to an automated channel control system; 	
 Automation of escapes, regulators and offtakes; 	
 Replacement of regulators and offtakes with manually operated gates: 	
 Replacement of concrete channels with gravity pipelines; 	
 Replacement of Dethridge wheels with electromagnetic flow meters: 	
 Installation of real time telemetry units and slow time telemetry units on metered outlets; 	
 Installation of radio telemetry units on escapes and regulators; and 	
• On-farm works to complement delivery system improvements,	
including tranche 2 of the on-farm works.	
HANWOOD MODERNISATION PROJECT	5,080
 Replacement of earth and concrete lined channels, with gravity pipelines; 	
Replacement of regulating structures;	
 Upgrade of gravity channel to an automated channel control system; 	
 Installation of new electromagnetic flow meters; and 	
• On-farm works to complement delivery system improvements.	
ON-FARM PROJECT	15.005
TOTAL	38,115

8. Statement of Expenditure

	PIIOP Round 2 As per Budget (Item 4.1 in the Funding Agreement)	Organisation Contribution/Commonwealth Funds - Total project budget	Organisation Contribution/Commonwealth Funds - Total Spend for all Milestones	Organisation Contribution - Total project budget	Organisation Contribution - Total Spend for all Milestones	Commonwealth Funds - Total project budget	Commonwealth Funds - Total spend for all Milestones
1	WAH WAH STOCK AND DOMESTIC						
	Project Planning						
1.1	Project planning and development by MI	\$1,545,419.00	\$2,214,195.81	\$500,000.00	\$500,000.00	\$1,045,419.00	\$1,714,195.81
1.2	Sub-total Project Planning	\$1,771,951.00	\$2,654,424.64	\$500,000.00	\$500,000.00	\$1,271,951.00	\$2,154,424.64
	Off-farm pipeline works						
1.3	Supply, install and deliver off-farm pipes	\$11,528,521.00 \$1,315,247.00	\$19,931,317.29 \$2,351,239,89	\$0.00	\$0.00	\$11,528,521.00 \$1,315,247.00	\$19,931,317.29 \$2,351,239,89
1.4	Supply, install and deliver main pump station	\$1,313,247.00	\$6,653.00	\$0.00	\$0.00	\$1,313,247.00	\$6,653.00
1.5	Supply, install and deliver booster pump station Supply, install and deliver private pipelines	\$3,640,466.00	\$2,942,995.19	\$0.00	\$0.00	\$3,640,466.00	\$2,942,995.19
	Sub-total Off-farm pipeline works	\$17,083,488.00	\$25,232,205.37	\$0.00	\$0.00	\$17,083,488.00	\$25,232,205.37
17	On-farm works	\$322.400.00	\$268,549.99	\$0.00	\$0.00	\$322,400.00	\$268.549.99
1.7	Supply and deliver on-larm design	\$5,789,874.00	\$6,109,856.76	\$0.00	\$0.00	\$5,789,874.00	\$6,109,856.76
1.8	Supply and delivery costs of pipes and valves Supply stock watering points (tanks, troughs	\$4,293,988.00	\$5.047.155.60	\$0.00	\$0.00	\$4.293.988.00	\$5.047.155.60
1.9	and associated fittings) Sub-total On-farm works	\$10,406,262.00	\$11,425,562.35	\$0.00	\$0.00	\$10,406,262.00	\$11,425,562.35
	RLLS Works						
1.10	RLLS stock route works (supply and install)	\$628,584.00 \$628,584.00	\$829,587.71 \$829,587.71	\$0.00	\$0.00	\$628,584.00 \$628,584.00	\$829,587.71
	Telemetry works		•••••				
1.11	Supply and install telemetry for on-farm works	\$1,566,950.00	\$442,311.20	\$0.00	\$0.00	\$1,566,950.00	\$442,311.20
1.12	Supply and install telemetry for off-farm works	\$165,600.00	\$87,064.19	\$0.00	\$0.00	\$165,600.00	\$87,064.19
	Sub-total Telemetry	\$1,732,550.00	\$529,375.39	\$0.00	\$0.00	\$1,732,550.00	\$529,375.39
1.13	Project Design	\$227,721.00	\$13,668.00	\$0.00	\$0.00	\$227,721.00	\$13,668.00
1.14	Project Management	\$1,620,469.00	\$4,463,817.54	\$0.00	\$0.00	\$1,620,469.00	\$4,463,817.54
1.15	crossings	\$138,400.00	\$0.00	\$0.00	\$0.00	\$138,400.00	\$0.00
1.16	MI Construction Contingency Sub-total Other Works	\$9,387,820.00	\$4,477,485.54	\$0.00	\$0.00	\$9,387,820.00	\$4,477,485.54
	TOTAL SUB-PROJECT 1	\$42,997,245.00	\$45,148,641.00	\$500,000.00	\$500,000.00	\$42,497,245.00	\$44,648,641.00
2	MIA MODERNISATION WORKS						
2.1	MI Preliminary Project and Design	\$858,826.00	\$858,826.00	\$0.00	\$0.00	\$858,826.00	\$858,826.00
2.2	TOC Development	\$800,000.00	\$1,596,929.01	\$0.00	\$0.00	\$800,000.00	\$1,596,929.01
2.3	Planning and Development Pipelines	\$6,123,630.60	\$5,890,896.58	\$207,500.00	\$0.00	\$5,916,130.60	\$5,890,896.58
2.5	New/Remodelled Structures	\$3,113,294.47	\$2,956,986.58	\$0.00	\$0.00	\$3,113,294.47	\$2,956,986.58
2.6	Customer Outlets	\$1,706,387.93	\$2,362,952.89 \$25,606,620.34	\$0.00	\$0.00	\$1,706,387.93 \$12,456,075,00	\$2,362,952.89 \$25,220,988,10
2.7	Mobilisation	\$676,914.00	\$626,785.10	\$0.00	\$0.00	\$676,914.00	\$626,785.10
2.9	Construction Overheads	\$10,044,357.00	\$9,624,822.68	\$0.00	\$0.00	\$10,044,357.00	\$9,624,822.68
2.10	Contractor Fees	\$3,021,519.00 \$375,000.00	\$2,536,567.33 \$773,913.00	\$0.00	\$0.00	\$3,021,519.00 \$375,000.00	\$2,536,567.33 \$773,913.00
2.11	MI Project Management and Stakeholder	\$2,838,705.00	\$54,381.07	\$0.00	\$0.00	\$2,838,705.00	\$54,381.07
2.13	MI Minor Capital Works - Part 1	\$2,625,000.00	\$2,625,000.00	\$0.00	\$0.00	\$2,625,000.00	\$2,625,000.00
2.14	MI Minor Capital Works - Part 2 IRMMS	\$1,500,000.00	\$1,375,000.05	\$0.00	\$0.00	\$1,375,000.00	\$1,375,000.05
2.16	MI Construction Contingency	\$3,196,251.00	\$0.00	\$0.00	\$0.00	\$3,196,251.00	\$0.00
	Sub-total Off-farm works	\$50,930,860.00	\$57,099,748.64	\$207,500.00	\$385,632.24	\$50,723,360.00	\$56,714,116.40
2.17	Bilbul On-farm Works	\$2,231,422.00	\$646,880.73	\$0.00	\$0.00	\$2,231,422.00	\$646,880.73
2.18	NBC Yenda On-farm Works	\$2,498,222.00	\$1,396,874.76	\$0.00	\$0.00	\$2,498,222.00	\$1,396,874.76
2.19	Additional MIA On-farm Works	\$32,567,473.00	\$32,496,194.71	\$0.00	\$0.00	\$32,567,473.00	\$22,406,104,71
	Sub-total On-farm works	\$39,391,096.00	\$36,122,422.68	\$227,500.00			\$32,490,194.71
3	HANWOOD MODERNISATION	\$90,321,956.00	Ban non 181		\$227,500.00	\$39,163,596.00	\$35,894,922.68
	Off-farm works		\$93,222,171.32	\$435,000.00	\$227,500.00 \$613,132.24	\$39,163,596.00 \$89,886,956.00	\$35,894,922.68 \$92,609,039.08
3.1			\$93,222,171.32	\$435,000.00	\$227,500.00 \$613,132.24	\$39,163,596.00 \$89,886,956.00	\$32,495,194,11 \$35,894,922.68 \$92,609,039.08
2.5	Planning and Development MI Preliminary Project and Device	\$934,335.00	\$93,222,171.32 -\$10,368.17 \$1.996.672.00	\$435,000.00 \$0.00	\$227,500.00 \$613,132.24 \$0.00	\$39,163,596.00 \$89,886,956.00 \$934,335.00 \$1,207.000.00	\$35,894,922.68 \$92,609,039.08 -\$10,368.17 \$1.266.872.00
3.2 3.3	Planning and Development MI Preliminary Project and Design Earthworks	\$934,335.00 \$1,297,000.00 \$1,209,193.00	\$93,222,171.32 -\$10,368.17 \$1,296,672.00 \$391,070.15	\$435,000.00 \$0.00 \$0.00 \$0.00 \$0.00	\$227,500.00 \$613,132.24 \$0.00 \$0.00 \$0.00	\$33,163,598.00 \$89,886,956.00 \$934,335.00 \$1,297,000.00 \$1,297,000.00	\$1,296,672.00 \$92,609,039.08 \$92,609,039.08 \$1,296,672.00 \$31,296,672.00 \$391,070.15
3.2 3.3 3.4	Planning and Development MI Preliminary Project and Design Earthworks Pipelines	\$934,335.00 \$1,297,000.00 \$1,209,193.00 \$8,691,536.00	\$93,222,171.32 -\$10.368.17 \$1.296,672.00 \$391,070.15 \$10,364,269.53	\$435,000.00 \$0.00 \$0.00 \$0.00 \$5,184,000.00	\$227,500.00 \$613,132.24 \$0.00 \$0.00 \$0.00 \$0.00 \$6,749,721.24	\$39,163,596.00 \$89,886,956.00 \$934,335.00 \$1,297,000.00 \$1,299,193.00 \$3,507,538.00	\$1,256,492,268 \$22,609,039,06 \$1,256,672,00 \$3,216,266,772,00 \$3,216,454,29
3.2 3.3 3.4 3.5 3.6	Planning and Development MI Preliminary Project and Design Earthworks Pipelines New/Remodelled Structures Customer Outlets	\$834,335.00 \$1,297.000.00 \$1,208,193.00 \$8,691,556.00 \$844,548.00 \$1,525,967.00	\$83,222,171.32 -\$10,368.17 \$1,296,672.00 \$3910,070.15 \$10,364,269.53 \$1,049.63 \$1,778,227.6	\$435,000.00 \$0.00 \$5.184,000.00 \$5.184,000.00 \$5.0.00 \$0.00	\$227,500.00 \$613,132.24 \$0.00 \$0.00 \$6,749,721.24 \$0.00 \$0.00 \$0.00	\$39,163,596,00 \$89,886,956,00 \$1393,335,00 \$1,297,000,00 \$1,209,130,00 \$3,607,536,00 \$844,548,00 \$1,525,957,00	\$2,518,41,226 \$52,609,039.08 \$52,609,039.08 \$1,206,672.00 \$391,070.15 \$3,614,548.29 \$1,049,6049.33 \$1,778,227.06
3.2 3.3 3.4 3.5 3.6 3.7	Planning and Development MI Preliminary Project and Design Earthworks Pipelines New/Remodeled Structures Customer Outlets Automation	\$894,335.00 \$1,207,000.00 \$1,209,193.00 \$8,661,556.00 \$844,548.00 \$1,525,677.00 \$8,794,882.00	\$83,222,171,32 - \$10,388,17 \$1,296,672,00 \$10,364,269,53 \$1,096,049,53 \$1,096,049,53 \$1,778,227,98 \$5,192,391,99	\$435,000.00 \$0.00 \$5.00 \$5.184,000.00 \$5.30.00 \$0.00 \$0.00 \$0.00 \$0.00	\$227,500.00 \$613,132,24 \$0.00 \$0.00 \$0.749,721,24 \$0.00 \$8,749,721,24 \$0.00 \$0.00 \$0.00 \$0.00	\$38,163,566.00 \$89,686,956.00 \$1,297,000.00 \$1,297,000.00 \$1,209,133.00 \$3,507,556.00 \$844,548.00 \$1,567,556.00 \$44,548.00	\$1,21,51,151,1 \$55,84,922 & 6 \$92,609,039.08 \$92,609,039.08 \$1,206,672.00 \$391,070.15 \$3,614,548.29 \$1,049,049.33 \$1,778,227.85 \$3,51,92,391.99
3.2 3.3 3.4 3.5 3.6 3.7 3.8	Planning and Development MI Preliminary Project and Design Earthworks Pipelines New/Remodeled Structures Castomer Outlets Automation Mobilisation	\$834,335,00 \$1,207,000,00 \$3,601,536,00 \$8,661,536,00 \$8,445,440,00 \$1,525,667,00 \$5,794,882,00 \$57,794,882,00	\$83,222,171.32 - \$10.388.47 \$1.296,672.00 \$301.070.15 \$10.364,269.53 \$1.096.049.53 \$1.096.049.53 \$1.0778,227.96 \$5.102.391.05 \$5.102.391.05 \$372.064.00 \$5.700.050.05 \$5.700.050.05 \$5.700.050.05 \$5.700.050.05 \$5.700.050.05 \$5.700.050.05 \$5.700.050.05 \$5.700.050.05 \$5.700.050.05 \$5.700.050.05 \$5.700.050.050.050 \$5.700.050.050.050 \$5.700.050.050.050 \$5.700.050.050.050.0500 \$5.700.050.050.050.050000000000000000000	\$435,000.00 \$0.00 \$5.184,000.00 \$5.184,000.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	\$227,500.00 \$613,132,24 \$0.00 \$8,749,721,24 \$0.00 \$8,749,721,24 \$0.00 \$8,000 \$0.00 \$0.00 \$0.00 \$0.00	\$38,163,586,60 \$89,686,966,00 \$1,297,000,00 \$1,297,000,00 \$1,209,133,00 \$3,507,536,00 \$44,548,00 \$1,525,567,00 \$5,794,882,00 \$517,291,00 \$517,200,00 \$517,200,000\$\$507,000\$\$50	\$2,518,41,226 \$52,609,039.08 \$52,609,039.08 \$52,609,039.08 \$51,296,672.00 \$391,070.15 \$3,614,548.29 \$1,049,049.33 \$1,778,227,8 \$5,192,391.99 \$372,064.00
3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 3.10	Planning and Development MI Preliminary Project and Design Earthworks Pipelines NewRemodeled Structures Customer Outlets Automation Mobilisation Construction Overheads Contractor Fees	\$934,335.00 \$1,227,000.00 \$3,009,193.00 \$8,001,536.00 \$8,454.460 \$1,555,667 \$5,794,882.00 \$55,794,882.00 \$55,008,687.00 \$2,315,577.00	\$83,222,171,32 - \$10,388,47 \$1,296,672,00 \$10,364,269,53 \$1,096,049,53 \$1,096,049,53 \$1,076,227,96 \$5,162,391,99 \$372,064,00 \$5,220,205,69 \$2,568,220,41	\$435,000.00 \$0.00 \$5.184,000.00 \$5.184,000.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	\$27,500.00 \$613,132.24 \$0.00 \$0.00 \$0.00 \$0.749,721.24 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	\$38,163,586,60 \$89,686,956,60 \$1,297,000,00 \$1,297,000,00 \$1,209,133,00 \$3,507,536,00 \$1,255,587,00 \$1,255,587,00 \$5,796,882,00 \$517,291,00 \$6,068,687,00 \$2,315,578,00	32.5.187.197.1 555.884,222.68 \$92,609,039.08 510,268.17 \$1,296,672.00 \$3,614,548.29 \$1,066,044 33 \$1,778,227.96 \$5,192,391.99 \$372,064.00 \$5,879,972.34 \$2,589.29.041
3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 3.10 3.11	Planning and Development MI Preliminary Project and Design Earthworks Pipelines NewWermodelied Structures Customer Outlets Automation Mobilisation Construction Overheads Construction Overheads Contractor Fees Asbestos Removal	\$894,335.00 \$1,207,000.00 \$3,009,193.00 \$8,061,536.00 \$8,454,440 \$84,44,440 \$84,44,440 \$84,44,440 \$84,44,440 \$84,44,440 \$84,44,440 \$84,44,440 \$84,44,440 \$84,44,440 \$84,44,440 \$84,44,440 \$84,44,440 \$84,44,440 \$84,400 \$84,440 \$84,440 \$84,400 \$84,440 \$84,400 \$84,440 \$84,400 \$84,440\$ \$84,440\$ \$84,440\$ \$84,440\$ \$84,440\$ \$84,440\$84,440\$ \$	\$83,222,171.32 - \$10.388.47 \$1.296,672.00 \$301.070.15 \$10.364.269.53 \$1.096.049.53 \$1.096.049.53 \$1.096.049.53 \$1.0778,227.96 \$5.109.39119 \$5.109.301.05.69 \$372.064.00 \$5.592.005.69 \$2.568.200.41 \$156.128.77	\$435,000.00 \$0.00 \$5.184,000.00 \$5.184,000.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	\$27,500.00 \$613,132,24 \$0.00 \$0.00 \$0.00 \$0.749,721,24 \$0.000\$00 \$0.000\$00 \$0.000\$00\$00\$00\$00\$00\$00\$00\$00\$00\$00\$00\$	\$38,163,586,60 \$89,686,966,00 \$1,297,000,00 \$1,297,000,00 \$1,209,133,00 \$3,507,536,00 \$4,4558,687,00 \$5,794,882,00 \$5,794,882,00 \$5,794,882,00 \$5,734,00 \$2,2315,578,00 \$2,2315,578,00	32.5.84,92.26 \$92,609,039.08 \$92,609,039.08 \$92,609,039.08 \$92,609,039.08 \$1,296,672.00 \$3.614,548.29 \$1,066,040 \$3.614,548.29 \$1,778,227.66 \$5,192,391.99 \$372,064.00 \$5,879,972.34 \$2,589,2304.12 \$156,128.77
3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 3.10 3.11 3.12	Planning and Development MI Preliminary Project and Design Earthworks Pipelines NewWRemodelled Structures Customer Outlets Automation Mobilisation Construction Geeheads Construction Geeheads Asbestos Removal Asbestos Removal Non Cost Gairnhare MI Project Management and Stakeholder	\$934,335.00 \$1,207,000.00 \$3,009,193.00 \$8,001,536.00 \$8,454,446.00 \$8,454,460 \$8,746,482.00 \$5,746,482.00 \$5,746,482.00 \$5,806,867.00 \$2,315,578.00 \$2,305,078.00 \$2,300,000.00 \$300,000.00	\$93,222,171.32 - \$10.388.47 \$1.296,672.00 \$10,364.289.53 \$10,364.289.53 \$1,096.049.53 \$1,076,227.96 \$5,192.391.99 \$372.064.00 \$5,920.205.69 \$2,568.29.041 \$156,128.77 \$775,504.00 \$439.27.28	\$435,000.00 \$0.00 \$5.00 \$5.184,000.00 \$0.000\$00 \$0.000\$00 \$0.000\$00\$00\$00\$000\$0	\$27,500.00 \$613,132,24 \$0.000\$00 \$0.000\$00 \$0.000\$00\$00\$00\$00\$00\$00\$00\$00\$00\$00\$00\$	\$38,163,586,60 \$89,686,966,00 \$1,297,000,00 \$1,297,000,00 \$1,209,133,00 \$3,207,536,00 \$4,258,687,00 \$4,558,687,00 \$5,794,882,00 \$5,794,882,00 \$5,794,882,00 \$5,794,882,00 \$2,2315,578,00 \$2,200,000,00 \$300,000,00 \$300,000,00 \$2,000,000,00 \$300,000,00 \$2,000,000,00 \$300,000,000 \$300,000,0000,000 \$300,000,000,0000,000,000,000 \$300,000,000,000,000,0	212.188/1971 \$35.894,922 & & & & & & & & & & & & & & & & & &
3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 3.10 3.11 3.12 3.13 3.14	Planning and Development Mi Preliminary Project and Design Earthworks Pipelines NewRemodelled Structures Customer Outlets Automation Mobilisation Construction Overheads Contractor Fees Asbeatos Removal Non Cost Gainshare Mi Project Maragement and Stakeholder Engagement Mi Construction Continoency	\$934,335.00 \$1,267,000.00 \$3,069,193.00 \$3,669,1536.00 \$3,754,482.00 \$5,754,482.00 \$5,754,482.00 \$5,068,687.00 \$5,068,687.00 \$2,315,578.00 \$2,300,000.00 \$300,000.00 \$300,000.00 \$300,000.00 \$300,000.00 \$300,000.00	\$83,222,171.32 - \$10.388.47 \$1.296,672.00 \$301,070.15 \$10,364,269,53 \$1,096,049.53 \$1,096,049.53 \$1,0778,227.96 \$5,192,391.90 \$5,192,391.90 \$5,920,205.69 \$5,920,205.69 \$2,589,220.41 \$156,128.77 \$776,604.00 \$483,067,38 \$100,073.80 \$100,075.80 \$100,	\$435,000.00 \$0.00 \$0.00 \$5,184,000.00 \$0.000\$00 \$0.000\$00 \$0.000\$00\$00\$00\$00\$00\$00\$00\$00\$00\$00\$00\$	\$27,50.00 \$613,132,24 \$0.00 \$0.00 \$0.00 \$0.00 \$0.749,721,24 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$15,120.00 \$0.00	\$38,163,586,60 \$89,686,966,00 \$1,297,000,00 \$1,297,000,00 \$1,209,133,00 \$4,259,753,00 \$44,55,867,00 \$5,794,882,00 \$5,794,882,00 \$5,794,882,00 \$2,215,578,00 \$2,200,000,00 \$300,000,00 \$680,000,00 \$232,688,00	2.2.1987 (1977) \$555,894,922 & 8 \$92,609,039.08 \$92,609,039.08 \$1,296,672.00 \$33,614,548.29 \$3,614,548.29 \$3,614,548.29 \$3,614,548.29 \$3,72,064.00 \$5,679,972.30 \$5,679,972.30 \$5,679,972.30 \$5,679,972.30 \$5,679,972.30 \$5,679,972.30 \$5,679,972.30 \$5,679,972.30 \$5,679,972.30 \$5,679,972.30 \$5,679,972.30 \$5,679,972.30 \$5,694.00 \$467,947,38 \$5,004.00 \$467,947,38 \$5,004.00 \$467,947,38 \$5,004.00 \$467,947,38 \$5,004.00 \$467,947,38 \$5,004.00 \$467,947,38 \$5,004.00 \$467,947,38 \$5,005,004.00 \$5,004.00 \$467,947,38 \$5,004.00 \$5,004.00 \$467,947,38 \$5,004.00 \$45,
3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 3.10 3.11 3.12 3.13 3.14 3.15	Planning and Development MI Preliminary Project and Design Earthworks Pipelines NewRemodelled Structures Customer Outlets Automation Mobilisation Construction Overheads Contractor Fees Asbeatos Removal Non Cost Gainshare Mi Project Management and Stakeholder Engagement Mi Construction Contingency Laterals 12 and 18	\$894,335.00 \$1,287,000.00 \$3,080,193.00 \$8,681,536.00 \$3,546,1460 \$3,754,482.00 \$5,754,482.00 \$5,754,482.00 \$5,068,687.00 \$5,068,687.00 \$5,068,687.00 \$5,000,000.00 \$300,000.0000\$}	\$93,222,171.32 - \$10.388.47 \$1.296,672.00 \$10.364.269.53 \$1.086.4269.53 \$1.086.4269.53 \$1.086.409.53 \$1.0778,227.66 \$5.102.39119 \$372.064.00 \$5.920.205.69 \$2.589.209.41 \$156.128.77 \$775.504.00 \$483.067.38 \$1.000 \$2.999.099.00	\$435,000.00 \$0.00 \$0.00 \$5,184,000.00 \$5,184,000,00 \$0.00\$0 \$0.00 \$0.00 \$0.00 \$0.000\$00 \$0.00 \$0.000\$00\$00\$00\$00\$00\$00\$00\$00\$00\$00\$00\$	\$27,500 \$613,132,24 \$0,00 \$0,00 \$0,00 \$0,00 \$0,00 \$0,00 \$0,00 \$0,00 \$0,00 \$0,00 \$0,00 \$0,00 \$0,00 \$0,00 \$0,00 \$15,120,00 \$15,120,00 \$2,999,999,00	\$38,163,586,60 \$89,686,966,00 \$1,297,000,00 \$1,297,000,00 \$3,207,133,00 \$3,507,536,00 \$3,44,54,80,00 \$1,525,867,00 \$5,794,882,00 \$5,794,882,00 \$5,794,882,00 \$5,794,882,00 \$5,794,882,00 \$2,205,000,00 \$300,000,00 \$330,000,000 \$330,000,000 \$330,000,000 \$330,000,000 \$330,000,000 \$330,000,000 \$330,000,000 \$330,000,000 \$330,000 \$330,000,000 \$330,000,000 \$330,000 \$330,0000 \$330,000,000 \$330,00000 \$330,00000 \$330,00000000 \$330,0000000000	2.1.187.1 5.15.84,222.6 \$22,609,033.0 \$22,609,033.0 \$1,206,672.00 \$341.0701.5 \$3,614,548.2 \$1,060,048.53 \$1,778,227.96 \$1,778,227.96 \$1,778,227.96 \$5,679.072.34 \$2,589.2904.1 \$156,128.77 \$755,604.00 \$467,947.38 \$100,00 \$3,000 \$0,0
3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 3.10 3.11 3.12 3.13 3.14 3.15	Planning and Development MI Preliminary Project and Design Earthworks Pipelines Customer Outlets Customer Outlets Automation Mobilisation Construction Overheads Construction Overheads Construction Overheads Construction Overheads MI Project Management and Stakeholder Engagement MI Construction Contingency Laterals 12 and 18 Sub-total Off-farm works Or-Farm works	\$894,335.00 \$1,267,000.00 \$1,200,193.00 \$8,601,536.00 \$8,744,842.00 \$5,754,882.00 \$5,764,882.00 \$5,068,687.00 \$2,316,578.00 \$2,316,578.00 \$20,000.00 \$23,316,578.00 \$25,989,00 \$22,989,00 \$23,376,724.00	\$83,222,171.32 \$10,388,472 \$1,296,672,00 \$10,364,268,53 \$1,096,049,53 \$1,096,049,53 \$1,770,227,064,00 \$5,192,391,95 \$372,064,00 \$5,5192,391,95 \$372,064,00 \$5,592,020,205,69 \$372,064,00 \$483,067,38 \$156,128,77 \$785,604,00 \$483,067,38 \$10,399,000 \$2,999,999,00 \$33444,672,24	\$435,000.00 \$0.00 \$0.00 \$5.184,000.00 \$5.184,000.00 \$	\$227,5000 \$613,132,24 \$3,000 \$8,749,721,24 \$3,000 \$8,749,721,24 \$3,000 \$50,000 \$50,000 \$40,233,35 \$40,203,35 \$40,203,35 \$40,203,35 \$50,000 \$30,0000 \$30,0000 \$30,0000 \$30,0000 \$30,0000 \$30,0000 \$30,0000 \$30,0000 \$30,0000 \$30,0000 \$30,0000 \$30,0000 \$30,00000 \$30,0000 \$30,000000 \$	\$38,163,586,60 \$89,889,956,00 \$1,297,000,00 \$1,297,000,00 \$1,209,133,00 \$3,209,133,00 \$3,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$2,209,000,00 \$300,000,00 \$300,000,00 \$326,192,725,00 \$225,192,725,00	2.2.:48/19.11 \$35.8,84,222 && \$92,609,039.08 \$92,609,039.08 \$12,966,672.00 \$3910,070.15 \$3,614,548.29 \$1,066,049.35 \$1,778,227.96 \$5,192,391.99 \$372,046.00 \$5,679,972.34 \$2,589,299.41 \$156,128.77 \$785,604.00 \$467,947.33 \$0.00 \$3,000 \$3,000,580,699.65
3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 3.10 3.11 3.12 3.13 3.14 3.15 3.16	Planning and Development MI Preliminary Project and Design Earthworks Pipelines NewRemodelled Structures Customer Outlets Automation Mobilisation Construction Oxerheads Construction Oxerheads Construction Oxerheads Construction Oxerheads MI Project Management and Stakeholder Engagement MI Construction Contingency Laterals 12 and 18 Sub-total Off-farm works Hanwood On-farm works	\$894,335.00 \$1,267,000.00 \$1,206,193.00 \$8,661,536.00 \$8,764,682.00 \$5,764,682.00 \$5,764,682.00 \$5,763,000.00 \$2,315,678.00 \$20,000.00 \$23,315,678.00 \$20,000.00 \$23,315,678.00 \$23,989,999.00 \$33,376,724.60 \$5,865,541.00	\$83,222,171.32 - \$10.388,47 \$1.296,672.00 \$301,070.15 \$10,364,268,53 \$1,096,049,53 \$1,096,049,53 \$1,778,227,96 \$5,192,391,90 \$372,064,00 \$5,920,205,69 \$372,064,00 \$5,920,205,69 \$372,064,00 \$5,920,205,69 \$374,67,38 \$483,067,	\$435,000.00 \$0.00 \$0.00 \$5.194,000.00 \$5.00 \$0	\$227,50,00 \$613,132,24 \$3,000 \$8,749,721,24 \$3,000 \$8,749,721,24 \$3,000 \$30,000 \$30,000 \$40,233,35 \$40,233,35 \$30,000\$30,000 \$30,0000 \$30,0000 \$30,0000 \$30,0000 \$30,0000 \$30,0000 \$30,0000 \$30,0000 \$30,0000 \$30,0000 \$30,0000 \$30,00000 \$30,0000 \$30,0000 \$30,0000 \$30,00000	\$38,163,586,60 \$89,889,986,00 \$1,297,000,00 \$1,297,000,00 \$1,297,000,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$2,315,578,00 \$2,315,578,00 \$2,315,578,00 \$2,315,578,00 \$3,00,000,00 \$3,000,000,000,000 \$3,000,000,000,000 \$3,000,000,000,000,000,000 \$3,000,000,000,000,000,000,000,000,000,0	23.2.189.1 (9.1) \$35.8,84,922 & & & & & & & & & & & & & & & & & &
3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 3.10 3.11 3.12 3.13 3.14 3.15 3.16	Planning and Development MI Preliminary Project and Design Earthworks Pipelines NewRemodelled Structures Customer Outlets Automation Mobilisation Construction Overheads Construction Overheads Construction Coetheads Construction Coetheads MI Project Management and Stakeholder Engagement MI Construction Contingency Laterals 12 and 18 Sub-total Off-farm works On-Farm works Sub-total Off-farm works Confarm works Confarm works	\$894,335.00 \$1.287,000.00 \$1.206,193.00 \$8.681,536.00 \$8.464,546.00 \$8.784,482.00 \$8.086,687.00 \$2.315,578.00 \$2.000.00 \$2.300,000.00 \$2.300,000.00 \$2.800,000.00 \$2.800,000.00 \$3.35,778,20 \$2.999,999.00 \$3.35,76,724.00 \$5.865,341.00 \$5.865,	\$83,222,171.32 - \$10.388.47 \$1.296,672.00 \$10.364.268.53 \$1.096.049.53 \$1.096.049.53 \$1.0778.227.064.00 \$5.192.391.99 \$377.064.00 \$5.592.020.669 \$357.064.00 \$483.067.38 \$156.128.77 \$785.604.00 \$483.067.38 \$196.128.77 \$785.604.00 \$483.067.38 \$196.128.77 \$785.604.00 \$483.067.38 \$483.067.38 \$1,284.402.32 \$4,264.402	\$435,000.00 \$0.00 \$0.00 \$5,184,000.00 \$5,184,000.00 \$	\$227,50,00 \$613,132,24 \$3,0,00 \$8,749,721,24 \$3,0,00 \$8,749,721,24 \$3,0,00 \$30,00 \$40,233,35 \$40,233,35 \$30,00 \$40,233,35 \$30,00 \$326,673,000\$ \$326,673,000\$ \$326,673,000\$ \$326,673,000\$ \$326,673,000\$ \$326,673,000\$ \$326,673,000\$ \$326,673,000\$ \$326,673,000\$ \$326,673,000\$ \$326,673,000\$ \$326,673,000\$ \$326,673,000\$ \$326,673,000\$ \$326,673,000	\$38,163,586,60 \$89,889,986,00 \$1,297,000,00 \$1,297,000,00 \$1,297,000,00 \$1,209,193,00 \$1,209,193,00 \$1,209,193,00 \$1,209,193,00 \$1,209,193,00 \$1,209,193,00 \$1,209,193,00 \$1,209,193,00 \$1,209,193,00 \$2,209,000,00 \$300,000,000 \$300,000,000,000 \$300,000,000,000 \$300,000,000,000,000 \$300,000,000,000,000,000,000,000,000,000	23.2.189.1 (9.7) \$55.8,84,222 && \$92,609,039.08 \$12,266,072.00 \$31.096,047.30 \$1.296,672.00 \$31.096,048.33 \$1.778,227.96 \$1.096,048.33 \$1.778,227.96 \$1.096,048.33 \$1.778,227.96 \$1.096,048.33 \$1.778,227.96 \$1.096,048.33 \$1.778,227.96 \$1.096,048.33 \$1.097,048.37 \$2.580,299,41 \$1.56,128.77 \$77,56,040.00 \$2.580,299,41 \$1.56,128.77 \$77,56,040.00 \$2.580,299,45 \$3.000 \$3.000 \$3.000 \$3.000 \$3.000 \$3.007,619.32 \$2.572,574.00 \$2.572,574.00 \$3.007,574.32 \$3.007,619.32 \$2.572,574.00 \$2.572,574.00 \$3.007,574.32 \$3.007,619.32 \$3.007,619.32 \$2.572,574.00 \$2.572,574.00 \$3.007,574.32 \$3.007,619.32 \$2.572,574.00 \$2.572,574.00 \$3.007,574.32 \$3.007,619.32 \$2.572,574.00 \$3.007,574.32 \$3.007,674.32 \$3.0
3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 3.10 3.11 3.12 3.13 3.14 3.15 3.16	Planning and Development MI Preliminary Project and Design Earthworks Pipelines Customer Outlets Automation Mobilisation Construction Overheads Construction Overheads Construction Coerheads Construction Coerheads Construction Coerheads Construction Coerheads Construction Coerheads Construction Contingency Laterals 12 and 18 Sub-total Off-farm works On-Farm works Sub-total On-farm works TOTAL SUB-PROJECT 3 PROJECT MANAGEMENT, DESIGN &	\$894,335.00 \$1.287,000.00 \$1.208,193.00 \$84,548.00 \$84,548.00 \$5,784,882.00 \$8,088,687.00 \$8,088,687.00 \$23,050,000.00 \$23,357,878.00 \$230,000.00 \$24,999.00 \$24,999.00 \$24,999.00 \$24,999.00 \$24,999.00 \$25,999.00 \$25,999.00 \$25,99	\$83,222,171.32 \$10,388,477 \$1,296,672,00 \$10,364,268,53 \$10,364,268,53 \$1,096,049,53 \$1,096,049,53 \$1,778,2279 \$5,192,391,99 \$377,027,054,00 \$5,192,020,056,69 \$5,192,020,056,69 \$5,192,020,056,69 \$5,192,020,056,69 \$3,542,054,000 \$483,067,38 \$1,964,000 \$2,999,999,00 \$3,344,657,24 \$4,264,492,32 \$4,264,492,32 \$4,264,492,32 \$4,264,492,32 \$3,779,164,59 \$3,779,179,179 \$3,779,179,179,179 \$3,779,179,179,17	\$435,000.00 \$0.00 \$0.00 \$5,184,000.00 \$5,184,000.00 \$	\$227,5000 \$613,132,24 \$3,000 \$8,749,721,45 \$3,000 \$8,749,721,45 \$3,000 \$30,000 \$30,000 \$40,233,35 \$40,233,35 \$40,233,35 \$30,000 \$30,000 \$30,000 \$30,000 \$30,000 \$30,000 \$30,000 \$30,000 \$30,000 \$30,000 \$30,000 \$310,131,946,94 \$10,131,946,94	\$38,163,586,60 \$89,889,956,00 \$1,297,000,00 \$1,297,000,00 \$1,209,193,00 \$4,209,193,00 \$4,209,193,00 \$4,209,193,00 \$1,529,987,00 \$5,794,882,00 \$5,794,882,00 \$5,794,882,00 \$5,794,882,00 \$5,794,882,00 \$5,794,882,00 \$5,794,882,00 \$5,794,882,00 \$5,794,882,00 \$5,794,882,00 \$5,794,882,00 \$5,994,982,00 \$5,994,982,00 \$5,994,982,00 \$5,994,982,00 \$5,994,992,000,000,000,000,000,000,000,000,000	232,588,94,222 & \$32,609,039,08 \$32,609,039,08 \$32,609,039,08 \$32,609,039,08 \$3,51,415,448 \$3,51,415,448 \$3,51,415,448 \$3,51,415,448 \$3,51,415,448 \$3,51,415,448 \$3,51,415,448 \$3,51,415,448 \$3,51,415,448 \$3,51,415,448 \$3,51,415,418 \$4,51,415,418,418 \$4,51,415,418,418,418,418,418,418,418,418,418,418
3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 3.10 3.11 3.12 3.13 3.14 3.15 3.16 4	Planning and Development MI Preliminary Project and Design Earthworks Pipelines Customer Outlets Automation Mobilisation Construction Overheads Construction Overheads Construction Coefficients Mi Droject Management and Stakeholder Engagement MI Construction Conlingency Laterals 12 and 18 Sub-total Off-farm works On-Farm works Sub-total Off-farm works Sub-total On-farm works Sub-total On-farm works On-Farm works Sub-total On-farm works On-Farm works Sub-total On-farm works On-Sub-PROJECT 3 PROJECT MANAGEMENT, DESIGN & CONTINGENCY	\$894,335.00 \$1.287,000.00 \$1.208,193.00 \$844,548.00 \$844,548.00 \$5,784,882.00 \$5,784,882.00 \$5,784,882.00 \$5,782,000.00 \$2,235,578.00 \$2,200,000.00 \$5,800,000 \$5,800,0000\$5,800,000\$5,800,000\$5,800,000\$5,800,000\$5,800,000\$5,800,000\$5,800\$	\$83,222,171.32 \$10,386,477 \$1,296,672,00 \$10,364,268,53 \$10,364,268,53 \$1,096,049,53 \$1,778,227,96 \$5,192,391,90 \$5,192,391,90 \$5,192,391,90 \$5,192,391,90 \$5,192,391,90 \$5,192,391,90 \$5,192,391,90 \$5,292,040,00 \$483,067,38 \$156,128,77 \$785,604,00 \$483,067,38 \$156,128,77 \$785,604,00 \$3,344,674,24 \$4,264,492,32 \$4,264,492,32 \$3,767,164,56 \$5,998,499,00	\$435,000.00 \$0.00 \$0.00 \$5,184,000.00 \$0	\$227,50,00 \$613,132,24 \$3,0,00 \$8,749,721,45 \$3,0,00 \$8,749,721,45 \$3,0,00 \$3,0,00 \$3,0,00 \$40,233,35 \$40,233,35 \$40,233,35 \$3,0,00 \$4,0,233,35 \$3,0,00 \$3,000\$\$3,000\$\$3,0	\$38,163,586,60 \$89,889,956,00 \$1,297,000,00 \$1,297,000,00 \$1,297,000,00 \$1,297,000,00 \$1,209,173,00 \$1,209,173,00 \$1,209,173,00 \$1,209,173,00 \$1,209,173,00 \$1,209,173,00 \$1,209,173,00 \$1,209,173,00 \$2,209,000,00 \$2,25,1192,725,00 \$2,25,1192,725,00 \$2,25,1192,725,00 \$3,009,056,00 \$1,650,000,000 \$1,650,000,000 \$1,650,000,000 \$1,650,000,000 \$1,650,000,000 \$1,650,000,000 \$1,650,000,000 \$1,650,000,000 \$1,650,000,000 \$1,650,000,000 \$1,650,000,000 \$1,650,000,000 \$1,650,000,000 \$1,650,000,000 \$1,650,000,000 \$1,650,000,000 \$1,650,000,000 \$1,25,1192,725,000 \$1,650,000 \$1,650,000,000,000 \$1,650,000,000,000 \$1,650,000,000,000,000 \$1,650,000,000,000,000,000,000,000,000,000	232,588,94,222 & 8 \$32,609,039,08 \$22,609,039,08 \$22,609,039,08 \$22,609,039,08 \$2,510,266,72,00 \$31,046,044 & 29 \$3,614,544 & 29\\ \$3,61
3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 3.10 3.11 3.12 3.13 3.14 3.15 3.16 4 4.1	Planning and Development MI Preliminary Project and Design Earthworks Pipelines Customer Outlets Automation Mobilisation Construction Overheads Construction Overheads Construction Coefficients Mi Droject Management and Stakeholder Engagement MI Construction Conlingency Laterals 12 and 18 Sub-total Off-farm works On-Farm works Con-Farm works Contal Sub-PROJECT 3 PROJECT MANAGEMENT, DESIGN & CONTINGENCY Project Management Automation Strategy	\$994,335.00 \$1.297,000.00 \$1.208,193.00 \$844,548.00 \$844,548.00 \$5,784,882.00 \$5,784,882.00 \$5,784,882.00 \$5,784,882.00 \$5,784,882.00 \$5,784,000.00 \$5,784,000.00 \$5,2868.000.00 \$5,2868.0000 \$5,2869.0000 \$5,2869.0000 \$5,2869.0000 \$5,2869.0000 \$5,2869.0000 \$5,2869.0000 \$5,2869.0000 \$5,2869.00000 \$5,2869.00000 \$5,2869.000000 \$5,2869.0000000 \$5,2869.000000000000000000000000000000000000	\$83,222,171.32 - \$10.388,47 \$1.296,672.00 \$10.364,268,53 \$1.09,649,53 \$1.09,649,53 \$1.09,649,53 \$1.07,78,227,96 \$372,064,00 \$5,192,391,90 \$372,064,00 \$5,202,026,69 \$372,064,00 \$483,067,33 \$156,128,77 \$785,604,00 \$483,067,33 \$156,128,77 \$785,604,00 \$2,2999,999,00 \$33,414,672,24 \$4,264,492,32 \$4,264,492,32 \$3,7679,164,56 \$5,998,409,00 \$59,960,00	\$435,000.00 \$0.00 \$0.00 \$5,184,000.00 \$0.00	\$227,500.0 \$613,132,24 \$3,000 \$8,000 \$8,749,721,24 \$3,000 \$8,000 \$8,000 \$3,000 \$40,233,35 \$40,233,35 \$40,233,35 \$30,0000\$ \$30,0000\$ \$30,0000\$ \$30,0000\$ \$30,0000\$ \$30,0000\$ \$30,0000\$ \$30,0000\$ \$30,0000\$ \$30,0000\$ \$30,000\$	\$38,163,586,60 \$89,889,956,00 \$1,297,000,00 \$1,297,000,00 \$1,297,000,00 \$1,209,173,00 \$1,209,173,00 \$1,209,173,00 \$1,209,173,00 \$1,209,173,00 \$1,209,173,00 \$1,209,173,00 \$1,209,173,00 \$1,209,070,00 \$2,25,192,725,00	232,587,94,222,85 \$22,609,033,08 \$22,609,033,08 \$22,609,033,08 \$1,206,672,00 \$3,107,15 \$3,107
3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 3.10 3.11 3.12 3.13 3.14 3.15 3.16 4 4.1 4.2 4.3	Planning and Development MI Preliminary Project and Design Earthworks Pipelines NewRemodelled Structures Customer Outlets Automation Mobilisation Construction Overheads Construction Overheads Construction Coefficient Mi Droject Management and Stakeholder Engagement MI Construction Conlingency Laterals 12 and 18 Sub-total Off-farm works On-Farm works Con-Farm works Con-Stal On-Farm works CONTIAL SUB-PROJECT 3 PROJECT MANAGEMENT, DESIGN & CONTINGENCY Project Management Automation Strategy MI Preliminary Project and Design	\$994,335.00 \$1.297,000.00 \$1.208,193.00 \$2.400 \$2.445.00 \$2.455.067.00 \$2.455.067.00 \$2.455.067.00 \$2.455.070.00 \$2.455.070.00 \$2.455.070.00 \$2.455.070.00 \$2.455.070.00 \$2.455.070.00 \$2.455.070.00 \$2.455.070.00 \$2.455.070.00 \$2.455.070.00 \$2.455.070.00 \$2.455.070.00 \$2.455.070.00 \$2.455.070.00 \$2.455.070.00 \$2.455.070.00 \$2.455.070.00 \$2.455.070.00 \$2.455.070.00 \$2.450.000.00 \$2.400.000.00 \$2.4	\$83,222,171.32 - \$10.388.47 \$1.296,672.00 \$301,070.15 \$10,364.268.53 \$1.096,049.53 \$1.096,049.53 \$1.778,227.96 \$372,064.00 \$5,920,205.69 \$352,064.00 \$430,67.33 \$156,128.77 \$785,604.00 \$483,067.33 \$156,128.77 \$785,604.00 \$443,067.33 \$33,44,672.24 \$33,44,672.24 \$33,44,672.24 \$42,64,492.32 \$4,264,492.32 \$4,264,492.32 \$3,7679,164,56 \$99,600.00 \$99,600.00 \$99,600.00 \$99,600.00	\$435,000.00 \$0.00 \$0.00 \$5,184,000.00 \$5,184,000.00 \$0.80,00 \$0.00 \$0.80,00 \$0.80,00 \$0.80,00 \$0.80,00 \$0.80,00 \$0.80,00 \$0.80,00 \$0.80,00 \$0.80,00 \$0.80,00 \$0.80,00 \$0.80,00 \$0.80,00 \$0.80,00 \$0.80,00 \$0.80,00 \$0.00,000 \$0.00,0000 \$0.00,0000 \$0.00,0000 \$0.00,0000 \$0.00,0000 \$0.00,00000 \$0.00,00000 \$0.00,000000 \$0.00,0000000000	\$227,50,00 \$613,132,24 \$3,000 \$8,000 \$8,749,721,45 \$0,000 \$8,000 \$8,000 \$9,000 \$9,000 \$9,000 \$9,000 \$9,000 \$15,120,00 \$3,0000\$3,0000\$3,00	\$38,163,586,60 \$89,889,966,00 \$1,297,000,00 \$1,297,000,00 \$1,297,000,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,106,00 \$2,315,578,00 \$2,315,578,00 \$2,315,578,00 \$2,315,578,00 \$2,315,578,00 \$2,315,578,00 \$3,000,000,00 \$3,000,000,00 \$3,000,000,00 \$1,97,772,00 \$1,000,000,00 \$1,97,772,00 \$1,000,000,00 \$1,97,772,00 \$1,000,000,000,000,000,000,000,000,000,0	232,587,589,4222 85 \$22,609,033,08 \$22,609,033,08 \$22,609,033,08 \$22,609,033,08 \$22,509,204 \$1,208,042,53 \$1,008,042,53 \$1,0708,227,96 \$3,072,34 \$2,509,204,00 \$3,072,34 \$2,509,204,10 \$3,072,34 \$2,509,204,10 \$3,072,509,204,10 \$3,072,509,204,10 \$3,072,509,204,10 \$3,072,509,204,10 \$3,070,519,32 \$23,609,598,65 \$3,037,619,32 \$3,000,0000 \$3,000,000
3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 3.10 3.11 3.12 3.13 3.14 3.15 3.16 4 4.1 4.2 4.3 4.4	Planning and Development MI Preliminary Project and Design Earthworks Pipelines New/Remodelled Structures Customer Outlets Automation Mobilisation Construction Overheads Contractor Fees Abestors Removal Non Cost Gainshare MI Construction Contingency Literris 12 and 18 Sub-total Off-farm works On-Farm works Harmood On-Farm works Sub-total On-farm works Contingency Project Management Automation Stategy MI Preliminary Project and Design Contingency	\$994,335.00 \$1.297,000.00 \$1.208,193.00 \$2.869,546.00 \$2.869,546.00 \$2.959,570.00 \$2.959,570.00 \$2.959,570.00 \$2.959,5770.00 \$2.959,5	\$83,222,171.32 - \$10.388,47 \$1.296,672.00 \$10.364,269,53 \$10.364,269,53 \$1.096,049,53 \$1.096,049,53 \$1.0778,227,96 \$372,064,00 \$5,920,205,69 \$372,064,00 \$5,920,205,69 \$372,064,00 \$483,067,38 \$156,128,77 \$785,604,00 \$483,067,38 \$156,128,77 \$785,604,00 \$483,067,38 \$156,128,77 \$785,604,00 \$33,414,672,24 \$337,679,164,56 \$49,000 \$99,600,00 \$1,971,770,00 \$1,971,770,00 \$1,900,1770,00 \$1,971,770,00 \$1,900,1770,00 \$1,900,1770,00 \$1,900,1770,00 \$1,900,1770,00 \$1,971,770,00 \$1,900,1700,00 \$1,900,1700,000 \$1,900,1700,000,1700,000,000 \$1,900,1700,000,000,000,	\$435,000.00 \$0.00 \$0.00 \$5,184,000.00 \$5,184,000.00 \$	\$227,50,00 \$613,132,24 \$3,000 \$8,749,721,24 \$3,000 \$8,749,721,24 \$3,000 \$30,000 \$30,000 \$40,233,35	\$38,163,586,60 \$89,889,966,00 \$1,297,000,00 \$1,297,000,00 \$1,297,000,00 \$1,297,000,00 \$1,209,173,00 \$1,209,173,00 \$1,209,173,00 \$1,209,173,00 \$1,209,173,00 \$1,209,173,00 \$1,209,173,00 \$2,315,578,00 \$2,315,578,00 \$2,315,578,00 \$2,315,578,00 \$2,315,578,00 \$2,315,578,00 \$2,315,578,00 \$2,315,578,00 \$2,315,578,00 \$2,315,578,00 \$2,315,578,00 \$2,315,578,00 \$3,00,00,00 \$3,00,00,00 \$1,650,000,00 \$1,971,770,00 \$4,856,671,00 \$4,856,671,00 \$4,856,671,00 \$3,00,00	2.2.1.87.1 (9.7) (3.5.8.94,922.68 \$92,609,033.08 \$1.206,672.00 \$3.910,770.15 \$3.614.548.17 \$1.906,672.00 \$3.910,770.15 \$3.910,770.15 \$1.908,049.53 \$1.778,227.96 \$3.72,044.00 \$3.877,047.08 \$3.972.34 \$2.589.2904.17 \$156,123.77 \$775,564.00 \$4.67,947.38 \$3.007 \$3.000 \$3.007 \$3.000 \$3.007 \$3
3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 3.10 3.11 3.12 3.13 3.14 3.15 3.16 4.1 4.2 4.3 4.4	Planning and Development MI Preliminary Project and Design Earthworks Pipelines New/Remodelled Structures Customer Outlets Automation Mobilisation Construction Overheads Contractor Fees Absetors Removal Nen Cost Gainehare MI Construction Contingency Literals 12 and 18 Sub-total Off-farm works On-Farm works Harwood On-Sam Works Sub-total On-farm works Contingency Project Management Automation Stategy MI Preliminary Project and Design Contingency Channel Endputshement	\$894,335,00 \$1,209,193,00 \$3,209,193,00 \$344,546,00 \$344,546,00 \$3,505,567,00 \$5,754,862 \$3,754,862 \$2,315,578,00 \$350,000,00 \$350,000,00 \$350,000,00 \$353,376,724,00 \$52,898,900 \$53,376,724,00 \$54,865,341,00 \$54,865,341,00 \$54,865,341,00 \$54,865,341,00 \$54,865,341,00 \$54,865,341,00 \$54,865,341,00 \$54,865,341,00 \$54,865,341,00 \$54,865,571,00 \$51,971,7720,00 \$1,971,7720,000,000,000,000,000,000,000,000,00	\$83,222,171.32 - \$10.388.47 \$1.296,672.00 \$301.070.15 \$10.364.269.53 \$1.096.049.53 \$1.096.049.53 \$1.0778,227.66 \$372.064.00 \$5.920.205.69 \$352.064.00 \$5.920.205.69 \$25.920.205.69 \$25.920.205.69 \$352.694.204.02 \$357.67.38 \$483.067.38 \$2.999.099.00 \$33.414,672.24 \$423.64.492.32 \$42.64.492.32 \$42.64.492.32 \$42.64.492.32 \$42.64.492.32 \$42.64.492.32 \$42.64.492.32 \$42.64.492.32 \$43.7679.164.56 \$5.996.499.00 \$99.600.00 \$1.971.770.00 \$0.00 \$1.971.770.00 \$0.00 \$3.001 \$3.276.533.82	\$435,000.00 \$0.00 \$0.00 \$5,184,000.00 \$5,184,000.00 \$	\$227,50,00 \$613,132,24 \$3,000 \$8,749,721,24 \$3,000 \$8,749,721,24 \$3,000 \$30,000 \$30,000 \$40,233,35	\$38,163,566,00 \$89,889,966,00 \$1,297,000,00 \$1,297,000,00 \$1,209,103,00 \$4,209,103,00 \$4,209,103,00 \$4,209,103,00 \$4,209,103,00 \$4,209,103,00 \$4,209,103,00 \$4,209,103,00 \$4,209,103,00 \$4,209,103,00 \$4,209,103,00 \$4,209,005,00 \$4,209,103,00 \$4,209,005,00 \$4,209,107,00 \$4,209,000,00 \$4,209,000,00 \$1,97,177,00 \$4,209,070,00 \$4,209,070,00 \$4,209,070,00 \$4,209,070,00 \$4,209,070,00 \$4,209,070,00 \$4,209,070,00 \$4,209,070,00 \$4,209,070,00 \$0,000,00 \$0,000,00 \$0,000,00 \$4,209,071,000,00 \$4,209,071,000,00 \$4,209,071,000,00 \$4,209,071,000,00 \$4,209,071,000,00 \$4,209,071,000,000 \$4,209,070,000,000 \$4,209,070,000,000 \$4,209,070,000,000 \$4,209,070,000,000 \$4,209,070,000,000 \$4,209,070,000,000 \$4,209,070,000,000 \$4,209,070,000,000 \$4,209,070,000,000 \$4,209,070,000,000 \$4,209,070,000,000 \$4,209,070,000,000 \$4,209,070,000,000 \$4,209,070,000,000 \$4,209,070,000,000 \$4,209,070,000,000 \$4,209,070,000,000 \$4,209,070,000,000,000 \$4,209,070,000,000,000,000,000,000 \$4,209,070,000,000,000,000,000,000,000,000,0	232,548,149,17 535,844,222 4 \$22,609,039,08 \$22,609,039,08 \$22,609,039,08 \$22,609,039,08 \$23,672,04 \$23,614,548 \$2,778,227,96 \$2,778,042,00 \$2,779,072,34 \$2,569,239,41 \$2,569,239,41 \$2,569,239,41 \$2,569,239,41 \$2,569,239,41 \$2,569,239,41 \$2,569,239,41 \$2,569,239,41 \$2,569,239,41 \$2,569,239,41 \$2,569,239,41 \$3,000 \$3,037,619,32 \$2,527,547,247,97 \$3,337,619,32 \$3,337,61
3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 3.10 3.11 3.12 3.13 3.14 3.15 3.16 4 4.1 4.2 4.3 4.4	Planning and Development MI Preliminary Project and Design Earthworks Pipelines New/Remodelled Structures Customer Outlets Automation Mobilisation Construction Overheads Contractor Fees Absetors Removal Nen Cost Gainehare MI Construction Contingency Literals 12 and 18 Sub-total Off-farm works On-Farm works Sub-total Off-farm works Sub-total On-farm works Contingency Project Management Automation Stategy MI Preleminary Project and Design Contingency Channel Endputs/Inner	\$894,335,00 \$1,209,193,00 \$3,209,193,00 \$344,546,00 \$344,546,00 \$3,505,567,00 \$5,754,862 \$3,754,862 \$2,315,578,00 \$350,000,00 \$350,000,00 \$350,000,00 \$353,376,724,00 \$52,899,900 \$53,376,724,00 \$52,890,900 \$52,890,900 \$53,376,724,00 \$52,890,900 \$52,890,900 \$53,376,724,00 \$52,890,900 \$53,376,724,00 \$53,376,724,00 \$53,376,724,00 \$53,376,71,00 \$54,865,71,00 \$53,000,000 \$50,000 \$50,000,000 \$50,000,000 \$50,000,000 \$50,000,000 \$50,000,000 \$50,000,000 \$50,000,000 \$50,000,000 \$50,000 \$50,000,000 \$50,000,000 \$50,000,000 \$50,000 \$50,000,000,000 \$50,000,000 \$50,000,0000 \$50,000,0000 \$50,0000,000	\$93,222,171.32	\$435,000.00 \$0.00 \$0.00 \$5,184,000.00 \$5,184,000.00 \$	\$227,90,00 \$613,132,24 \$0,00 \$8,749,721,24 \$0,00 \$8,749,721,24 \$0,00 \$0,00 \$0,00 \$0,00 \$0,00 \$0,00 \$0,00 \$10,133,35 \$10,133,945,59 \$10,131,945,59 \$10,131,945,59 \$10,131,945,59 \$10,131,945,59 \$10,232,86,73,00 \$10,232,86,73,00 \$10,232,86,73,00 \$10,232,86,73,00 \$10,232,86,73,00 \$10,232,86,73,00 \$10,232,86,73,00 \$10,232,86,73,00 \$10,232,86,73,00 \$10,232,86,73,00 \$10,232,86,73,00 \$10,232,86,73,00 \$10,232,86,73,00 \$10,232,86,73,00 \$10,232,86,73,00 \$10,232,86,73,00 \$10,232,86,73,00 \$10,232,86,73,82,75,73,82,75,75,75,75,75,75,75,75,75,75,75,75,75,	\$38,163,586,60 \$89,889,966,00 \$1,297,000,00 \$1,297,000,00 \$1,297,000,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$1,209,133,00 \$2,25,192,725,700,725,700,700,700,700,700,700,700,700,700,70	232,548,149,71

9. Conclusions

The investment in the infrastructure through PIIOP has directly benefited MI, its customers and the region through the creation of a modern and efficient irrigation network integrated with modernised on-farm water usage systems. It has supported and enhanced the scope and delivery of MI's automation program and brought forward efficiency benefits for MI and its customers. The automated delivery network has provided an immediate improvement in customer service levels, operating efficiency and safety, setting the region up for success in a future with less water.

The program has also supported the local economy through direct and indirect expenditure of over \$55M. Around \$35M of project funds was paid to contractors in the region and indirect expenditure in the region is estimated to be in excess of \$20M from staff and contractor spending on food, accommodation and leisure activities. MIARA staff and contractor numbers peaked at approximated 200 in mid-2018 noting that this was in combination with PIIOP 3 works, and all staff resided in the local area on a temporary basis for varying durations.

The investment has also realised a significant volume of water entitlement for the environment from efficiency savings without impacting the productive water pool. The 38,115 ML of efficiency savings will deliver environmental benefits across the Murray Darling Basin including to RAMSAR listed sites inside the MIA and to wetlands along the mid Murrumbidgee.