



WATSAVE AWARDS

Nomination Form¹

1. Information on Innovation

| | | | |
|---|--|------------|-------------------------------------|
| Innovations / Title (max. 10 words) | <u>Trangie-Nevertire Renewal</u> <u>An Irrigation Infrastructure Modernisation Success Story.</u> | | |
| First introduced:(Year) | Completed November 2014 | | |
| Area covered: Ha 100 000 | Water saved: 29889 ML ² | | |
| Award category (P please check one) | Technology <input type="checkbox"/> | Management | <input checked="" type="checkbox"/> |
| | Young Professional ³ <input type="checkbox"/> | Farmer | <input type="checkbox"/> |

2. Nominee Information⁴

| | | | |
|----------------|--|---------------|---------------|
| Nominee (1) | James Winter | | |
| Position | Chairman | | |
| Organization | <u>Trangie-Nevertire Co-operative Ltd</u> | | |
| Postal Address | "Carlisle" Mitchell Highway Trangie NSW 2823 Australia | | |
| Telephone | 02 68887689 | Fax | 02 68887040 |
| Email | jim.winter1@bigpond.com | Date of birth | 22/06/1962 |
| Citizen of | Australia | Mobile | +61428 651334 |

| | | | |
|----------------|---|---------------|---------------|
| Nominee (2) | Tony Quigley | | |
| Position | Treasurer | | |
| Organization | <u>Trangie-Nevertire Co-operative Ltd</u> | | |
| Postal Address | "Muntham" 282 Quigley Carroll Rd Trangie NSW 2823 Australia | | |
| Telephone | 02 68476338 | Fax | 02 68476214 |
| Email | quig@bigpond.com | Date of birth | 09/04/1961 |
| Citizen of | Australia | Mobile | +61419 297047 |

¹ One nomination per National Committee for each award category² MCM = Million Cubic Meters; BCM = Billion Cubic Meters³ Young Professional award does not require wide-spread implementation but must have been pilot tested in the field.⁴ Please add additional names and addresses as required.



3. Nominee Statement of about 1500 Words (in the following format)

(a) *Describe the innovation (essential)*

This modernisation /renewal project involved the transfer/sale of water to the Australian Government in return for funding to totally modernize the irrigation infrastructure of the Trangie-Nevertire Co-operative Ltd both off-farm and on-farm. Channel conveyance losses have reduced from in excess of 50% to 7%. On-farm productivity improved from greater availability of water and installation of “state of the art” farm irrigation systems.

Previous off-farm and on-farm irrigation losses are now being used for environmental benefit. Trangie-Nevertire Co-operative Ltd (TNCL) is a member owned irrigation scheme that pumps out of the Macquarie River in central west NSW that had reached its use-by date in the middle of the Millennium Drought. The combined pressure of high conveyance losses, a series of low or zero water allocation years, the threat of losing water and members to government buy-backs and ever-increasing costs led to the general realisation among members that it had to modernise to survive.

The first step was to develop a strategic plan from our membership base, which quantified our issues, which led to an application for Commonwealth funds (out of the then recently announced government funding of \$10 billion for the Murray Darling Basin) for a modernisation feasibility study.

This study allowed the Co-operative to be one of the initial applicants for Round 1 of the Private Irrigation Infrastructure Operators Program (PIIOP), and in May 2010 the Co-operative was granted \$115m to modernise its irrigation scheme, in exchange for 29889 ML of water savings transferred from its members to the Australian government for environmental use in the Ramsar-listed Macquarie Marshes.

The Modernisation Project had 5 major elements:

1. Reduction in the earthen channel system from 240 km down to 138 km and retiring 17 members permanently from irrigation.
2. Rebuilding the remaining 138 kms of channel system, lining 108 kms with Firestone EPDM rubber membrane, and installing a complete Rubicon water gate system, all enclosed within electric animal exclusion fencing.
3. Installing a 230 km Stock & Domestic pipeline from the river to all continuing and retiring members' farms to replace the previous reliance on the channel system.
4. Modernising the remaining members' on-farm irrigation infrastructure, with 24 linear move or centre pivot irrigators installed, as well as upgraded field layouts, tailwater return systems and storages.
5. Decommissioning the irrigation infrastructure on those retiring members' farms and reconfiguring them back to a dryland basis including the provision of piped stock and domestic water reticulation.

(b) *Describe how the innovation saves water (essential)*

The water savings in the project came from 4 main areas:

1. The reduction of the original earthen channel length by 40 percent, allowing 17 of our members on poorer irrigation soils to retire from active irrigation and reduce the footprint of the irrigation system substantially.
2. The lining of 138 kms of rebuilt main channel with EPDM rubber led to a massive reduction in seepage losses, especially where the channel traversed porous soil types



and paleo channels closer to the Macquarie River. EM38 testing and groundtruthing confirmed that up to 2 metres of water column per day was being lost to deep drainage in the worst of these prior streams. Clay lining of such leaky areas had been trialed in the recent past, but the drying and wetting cycle of our summer dominant pumping regime meant the clay kept migrating downstream away from the leaks. The selection of Firestone GeoGard EPDM for the channel liner was a major leap of faith as the product had never been used before on such a large scale in irrigation channels worldwide, but the advice, backup and warranty from Firestone gave the Board the confidence to proceed.

The inclusion of the automated Rubicon Total Channel Control system has substantially increased the level of service of water delivery to the Members, allowing on time and accurate on-farm water supply and measurement.

The combination of the technologies has reduced the channel conveyance losses from a historical average of 25% (range 20% to in excess of 50%) to now 7%. Substantial volumes of rainfall are captured and held in the lined channel sections most winters, often providing the initial pool fills prior to the pumping season commencing.

This has all lead to the farming members now having more water available to them at the farm gate now than pre-project.

The system can now operate to irrigate even in very low allocation years, as losses are stable and predictable whereas pre-modernisation 25% or greater allocations were needed to reduce the wet-up loss to tolerable levels



Photo 1. Lined channel section with Rubicon control gates.



3. The Stock and Domestic pipeline system has exceeded all expectations, with over 90% water savings achieved and clean pressurised river water is available to all our members every day of the year. This is in contrast to previously where stock and domestic water was supplied through the earthen channel system, and only when irrigation water was being supplied along each reach. In years of low or no irrigation allocation such deliveries were either not available or with very high wet up losses that meant thousands of megalitres needed to be pumped to deliver only a couple of hundred megalitres into open dams. Some of these areas have no or only poor-quality ground water, so this has been a huge improvement in livestock health and human amenity especially in drought times.
 4. The on-farm infrastructure upgrades on the remaining member farms have led to both water savings and yield increases on both summer and winter crops grown. Most of these projects were based around replacing traditional furrow surface irrigation with overhead sprinkler centre pivot and linear move irrigators. Water use on the predominant cotton crop under these machines has reduced by around 1 ML per ha while crop yields have risen by 1-2 bales/ha, leading to Water Use Efficiency increases in the order of 30%. Rotational winter crops have also showed WUE improvements, especially in chickpeas where a surface flood irrigation would often kill the crop from phytophthora root disease but the sprinkler irrigation allows high yields to be achieved as the application rate can be controlled to prevent waterlogging and accompanying root disease.
- (c) Describe how the innovation was introduced and spread (for Young Professional award, describe how the innovation will be introduced and spread). (essential)

As very few organisations worldwide had attempted a channel lining project of this scale, the Board and our Project Managers (Farrell Coyne Projects) visited other irrigation schemes both in Australia and Spain to assess the products that had been utilised in other projects. A short list of 10 liner products and 2 control systems was drawn up, examined and ranked in a matrix considering longevity, ease and speed of laying, ease of infield repair, fire risk, overall cost and product availability etc. Two liners were chosen to trial lay on 500 metre prepared channel sections, leading to the final choice of the Firestone GeoGard product.

Once the earthworks were completed there were a number of liner installation issues to be solved in the field. These included systems to unroll and place the geofabric underlay and liner in the correct alignment, a system to compensate for the 5% shrinkage that would occur as the EPDM further cured over time, the development of tools to cut the side anchor trenches into the compacted channel bank and techniques to join the rolls and terminate the liner at each in stream control structure.

These issues were all solved over time and by the end of the project the laying team were able to achieve over 2 kilometres of liner laid, joined, anchor trenched and terminated in a day.

The nearby Narromine Irrigation Board of Management was impressed with our liner solution to similar seepage losses in parts of their system and went on to apply EPDM to a substantial length of their channel system using the TNCL developed laying system and team as part of their modernisation.



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(d) *Describe the scope for further expansion of the innovation (essential)*

There is substantial scope for this channel lining system to be adopted across Australia and worldwide wherever seepage losses in open channels is a significant problem. TNCL has hosted many visits from directors and staff from major Australian irrigation corporations and smaller operators similar to us. All have been impressed with the modernisation package TNCL has achieved, and particularly with the conveyance loss reductions now evident after five irrigation seasons.

(e) *Describe the roles of the individual nominees (optional)*

The project was largely driven by TNCL Chairman James Winter and Treasurer Tony Quigley, but with strong support and backup from the rest of the Board. All directors completed site inductions which allowed prompt onsite inspections of works when challenges or problems arose to allow solutions to be developed without delaying the project. Strong support from our membership base, upon whose land the works were occurring, also contributed greatly to the project's success.



Photo 2. TNCL directors at river pump site for official opening. Stock and domestic pump shed and balance tanks in background.

Tight supervision and a great project management team meant that the project was delivered on time and within budget constraints and total administration cost were held to less than 7 percent of the total budget.

The proof of the pudding is in the eating, and this project has exceeded the expectations laid out at its inception by not only reducing channel conveyance losses substantially, but also with a much higher level of service delivery of irrigation water, clean fresh pressurised stock and domestic water available 24/7/365 and increased crop water use efficiency across our members farms.

Our members are happy and secure in the knowledge there is another 50 years of productive irrigated agriculture ahead of them and their families.



(Note The Nominee Statement forms the central piece of the nomination and shall be filled in very carefully and is essential for adjudication and further dissemination. The nomination shall be rejected if this statement is not self-explanatory.)

4. Documents Attached

- (a) Nomination Form
- (b) Nominee Statement in English/ French (*Sr. No.3*)
- (c) Curriculum Vitae of the Nominee(s)
- (d) Recent Digital Photograph of the Nominee(s) (*in high resolution*)
- (e) Documents/Reports/Technical Papers/Articles technically describing the innovation (*At least -3 technical documents supporting the Nominee Statement in electronic format*)

Final Project Report link

<http://www.agriculture.gov.au/SiteCollectionDocuments/water/trangie-nevertire-final-project-report.pdf>

Firestone Case Study link [http://www.storm-water.co.uk/wp-](http://www.storm-water.co.uk/wp-content/uploads/2014/10/Case-Study-Firestone-The-Trangie-Nevertire-Irrigation-Scheme-TNIS.pdf)

[content/uploads/2014/10/Case-Study-Firestone-The-Trangie-Nevertire-Irrigation-Scheme-TNIS.pdf](http://www.storm-water.co.uk/wp-content/uploads/2014/10/Case-Study-Firestone-The-Trangie-Nevertire-Irrigation-Scheme-TNIS.pdf)

5. Authentication¹

It is hereby certified that the research/application cited in the nominated work is an original work carried out by the authors to the best of knowledge and belief of the National Committee/Committee/Direct Member and hence the nominated work may be considered for the Award under the category of the WatSave Awards for which it is submitted.

- | | |
|------------------------------------|---|
| (a) Name of the National Committee | IACID - Irrigation Australia National Committee |
| (b) Name of the person | Bryan Ward, |
| (c) Position | Chief Executive Officer, Irrigation Australia Ltd |
| (d) Address | 11/58 Metroplex Avenue Murarrie, Queensland, Australia 4172 Tel: +61 7 3517 4000 Fax: +61 7 3517 4010 E-mail: bryan.ward@irrigation.org.au |
| (e) Signature (with Official seal) |  |

¹ National Committee must check the originality of the nomination/ submission and should make sure that it has not been submitted earlier/ elsewhere



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WatSave — Nomination Form

Date: 24th June 2019

Place: Murarrie, Queensland,
Australia

National Committees / Committee should forward **electronically** the nomination form(s), complete in all respects to The Secretary General, International Commission on Irrigation and Drainage (ICID), 48, Nyaya Marg, Chanakyapuri, New Delhi, India; E-mail: icid@icid.org; Tel +91-11-26116837 / +91-11-26115679, <http://www.icid.org>.



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4 (b) Nominee Statement

Nominee 1 – Jim Winter

Digital photo: Jim Winter (Attachment 4 (d))



Jim Winter has farmed Carlisle, near Trangie, on the Macquarie west of Dubbo, since 1993.

Chair of the Trangie Nevertire Cooperative Ltd (TNCL) for 18 years and in 2015 the TNCL PIIOP (Private Irrigation Infrastructure Operators Program) Project Management Team was awarded the 2015 NSW Professional excellence Award in the Infrastructure Category at the NSW Chapter of the Australian Institute of Building Awards.

Jim has advanced certificates in Agriculture and Irrigation and is the sole trader, with his wife of 'Carlisle' in Trangie NSW



4 (c) Curriculum Vitae James (Jim) Winter

**Curriculum Vitae for
James (Jim) Winter**

"Carlisle"
PO Box 57
Trangie NSW 2823
Mobile 0428 651 334
Email jim.winter1@bigpond.com

- | | |
|----------------------|--|
| 1978 | Leaving School Scots College Bellevue Hill Sydney Yr. 10 School Certificate |
| 1979 – 1981 | Inglewood Forest, Moree NSW Working Farm hand on family farm mixed farm |
| 1981 – 1982 | Murrumbidgee College of Agriculture, Yanco NSW <ul style="list-style-type: none">• Certificate in Agriculture• Advanced Certificate in Agriculture• Advanced Certificate in Irrigation |
| 1985 – 1986 Jobs: | Working Holiday; Working & Touring Canada & USA 12 months Farmhand; Holiday Resort Maintenance; Demolition; Painting; Construction and other civil works. |
| 1987 – 1993 | Inglewood Forest, Moree NSW Working on family farm; became partner, & moved into irrigation development, growing of irrigated crops, dryland cropping, and sheep farm. |
| 1993 – 2017 | 'Carlisle' Trangie NSW Moved to Trangie to manage total cropping farm, dryland & irrigated crops - partner in family business |
| 2017 – Present | 'Carlisle' Trangie NSW Taken farm over as sole trader, with wife |

Other Positions:

- On Trangie Nevertire Irrigation Scheme, / Co-Operative Ltd committee for 18 years, Chairman since May 2011.
- Since moving to Trangie have been on various community committees in various roles and positions.



4 (b) Nominee Statement

Nominee 2 – Anthony (Tony) Quigley

4 (b) Nominee Statement



Tony has 39 years industry experience farming and grazing on family properties totaling 8000 ha in the Trangie and Nevertire districts in Central Western New South Wales.

Tony Quigley is the Director and Treasurer of the Trangie-Nevertire Co-Operative Ltd and Trangie-Nevertire Irrigation Scheme for the past 20 years.

Tony has been the recipient of several industry awards including Australian Cotton Grower of the Year (under 500 ha) in 1999 and ANCID Irrigation Award – Effective Water Use on Farm in 2001.

He has an Associate Diploma in Farm Management



4 (c) Curriculum Vitae Anthony (Tony) Quigley

Curriculum Vitae for Anthony (Tony) Phillip Quigley

Age : 58

Qualifications

- Associate Diploma in Farm Management. (Orange Agricultural College)
- Member Australian Institute of Company Directors.

Current Industry Positions :

- Director and Treasurer, Trangie-Nevertire Co-operative Ltd and Trangie-Nevertire Irrigation Scheme. (20 years)
- Director, Cotton Seed Distributors Ltd and Cotton Seed International Pty Ltd (2 years)
- Chairman, Macquarie River Food and Fibre Inc. (2 years)
- Member, WaterNSW Macquarie Customer Advisory Group, and River Operations Stakeholder Consultative Committee. (4 years)

Industry Experience :

- 39 years farming and grazing on family properties totalling 8000 ha in the Trangie and Nevertire districts in Central Western New South Wales.
- Crops grown include irrigated and rain-fed cotton, wheat, barley, oats, canola, and chickpeas as well as prime lamb, wool and beef cattle grazing.
- Irrigation land development of 1250 ha equally split between linear move/ centre pivot irrigators based around cover crop and strip-till farming systems, and surface furrow irrigation utilizing pipe-through-bank techniques on 2 metre raised beds.

Industry Awards :

- Australian Cotton Grower of the Year (under 500ha) 1999
- ANCID Irrigation Award- Effective Water Use on Farm 2001

Contact details :

- Email quig@bigpond.com
- Twitter @QuigTony