



The Coorong Water Security Story

Coorong Tatiara Local Action Plan
Coorong & Tatiara District Councils

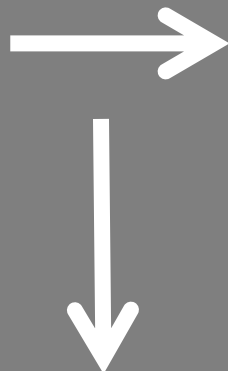


Coorong Water Security Advisory Group

The best land use for much of the Coorong Tatiara landscape is grazing perennial pastures

To advocate for livestock producers to access fit for purpose, dependable, and affordable water supply is critical in creating industry resilience

Livestock producers need to be in charge of their own destiny rather than beholden to a water utility



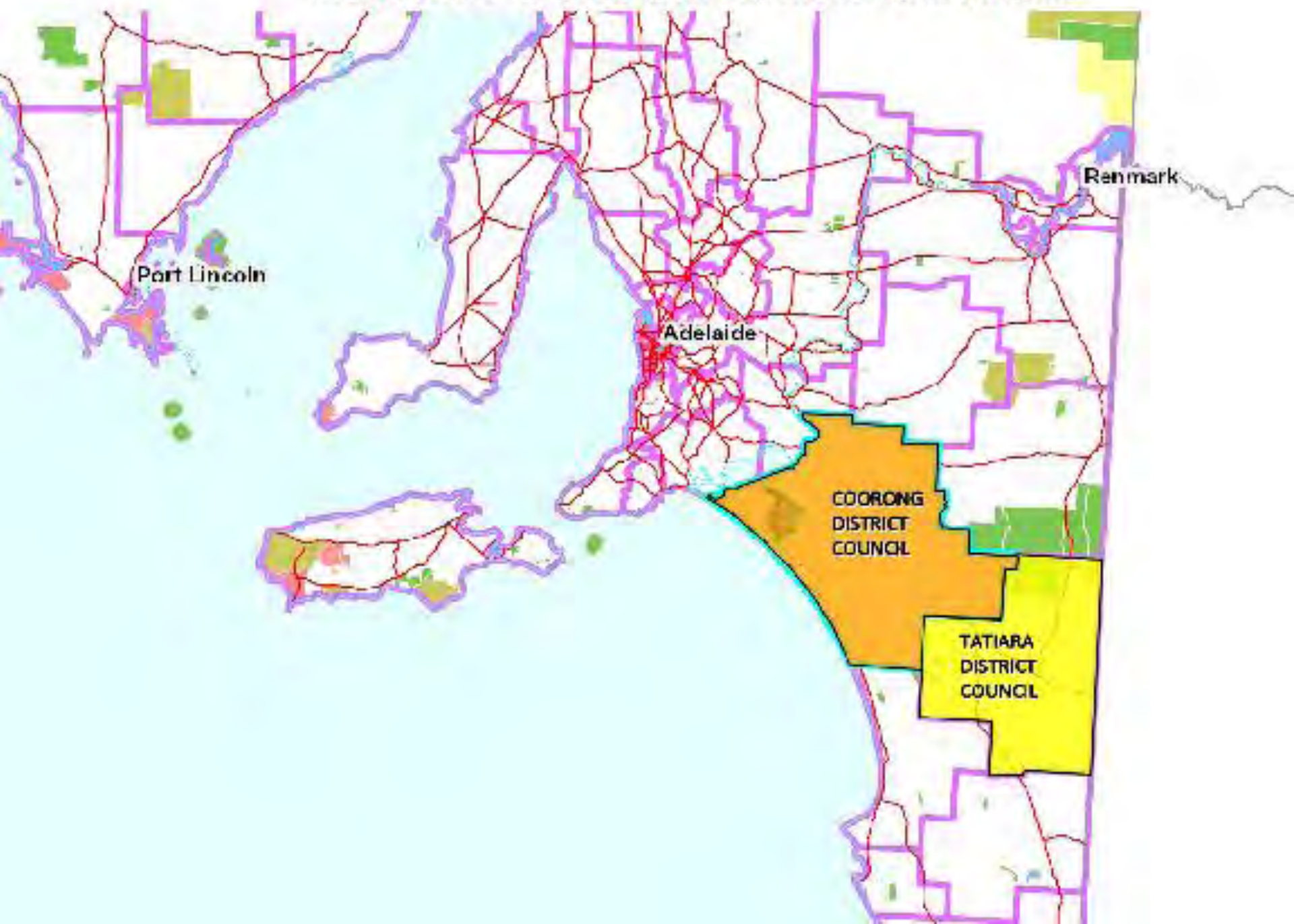
**Cost of
Water**

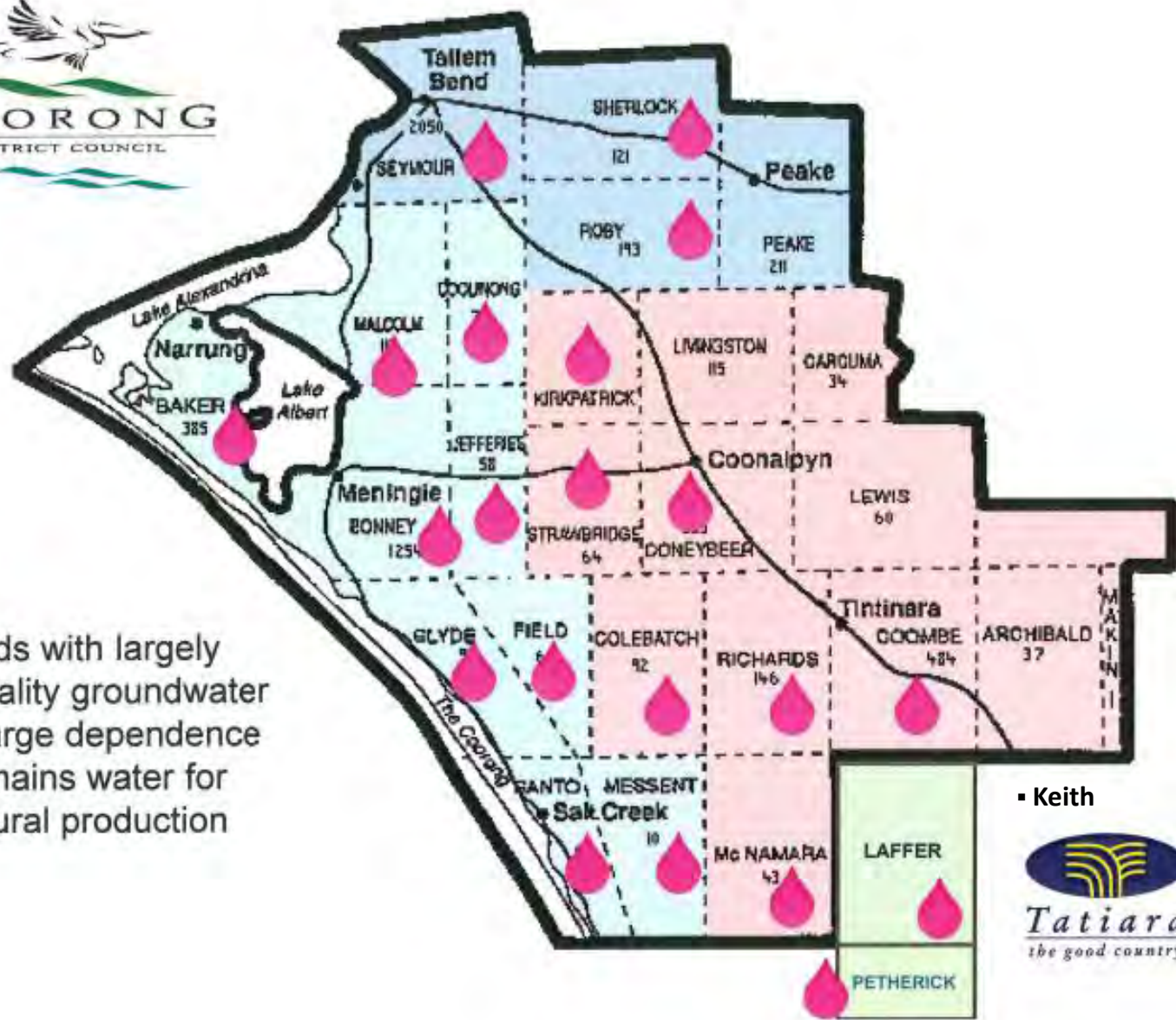


**Cattle to sheep
to cropping to
land
degradation**



COORONG & TATIARA COUNCIL DISTRICTS





Hundreds with largely poor quality groundwater and a large dependence on SA mains water for agricultural production

• Keith



Tailem Bend to Keith Pipeline



- 143 km long & feeds 800 km of branch mains
- Was the last of the major pipelines completed at the end of the 1960's
- Services an area of approximately 751,919 hectares including the Narrung Peninsula, and extends into the Tatiara & Kingston District Councils
- Opened up this country to agricultural production



**Annual mains water bills
for livestock producers are
now regularly over
\$100,000**

**An undetected mains water
leak can easily cost over
\$10,000**

**This is a dryland agriculture
issue**

**Mains water is far too expensive
to irrigate with**

**Groundwater is either absent or
hyper-saline and not an option
for livestock use**



Water for livestock production vs irrigation

7 megalitres per hectare per year is required to irrigate lucerne under a centre pivot



It would cost over \$20,000 / ha to irrigate with mains water to produce 1 ha of irrigated lucerne



Water Consumption

Average cattle unit
water consumption
per day = 100 litres

Dry ewe water
consumption per
day = 10L

This 22,000 litre tank holds enough water
for 1 cow for a year. (60 l / day)

@ 2008 prices = \$21.34 / year / cow

@ 2017 prices = \$73.26 / year / cow

@ 2017 prices = \$121.54 / year / cow & calf
unit



SA Water Price Increases

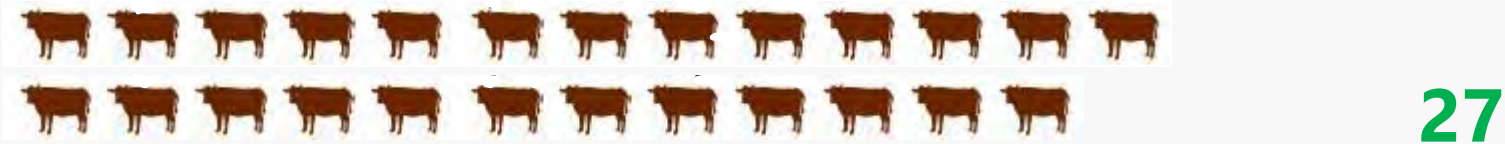
- 2005/06 \$1.06 /kl
- 2008 /09 \$1.16 /kl
- 2012/13 \$2.42 k/L
- 2013/14 \$2.26 k/L
- 2016/17 \$3.33 k/L
- 2018/19 \$3.37 k/L
- 2019/20 \$3.016 k/l
- 2020/21 \$2.714 k/l
- 2021/22 \$2.80 k/l

Colebatch Cattle Producers Mains Water Costs

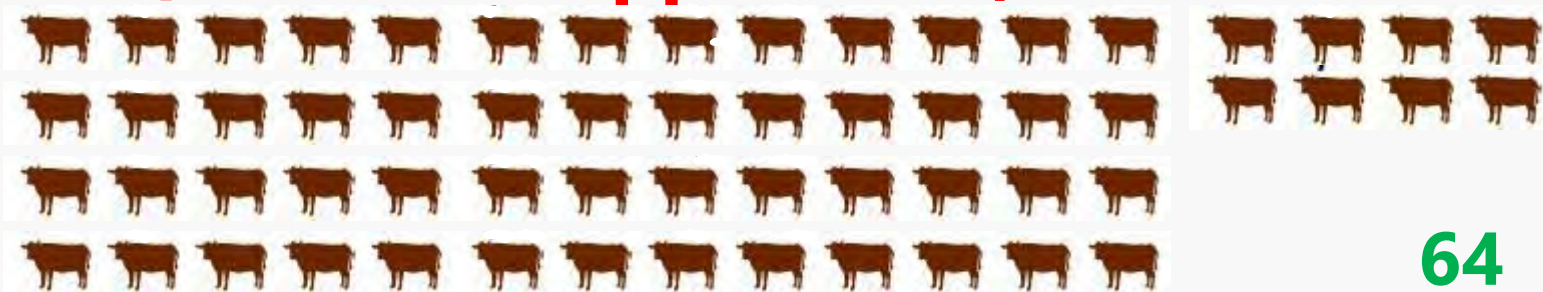
2005/2006 was approx \$21,000



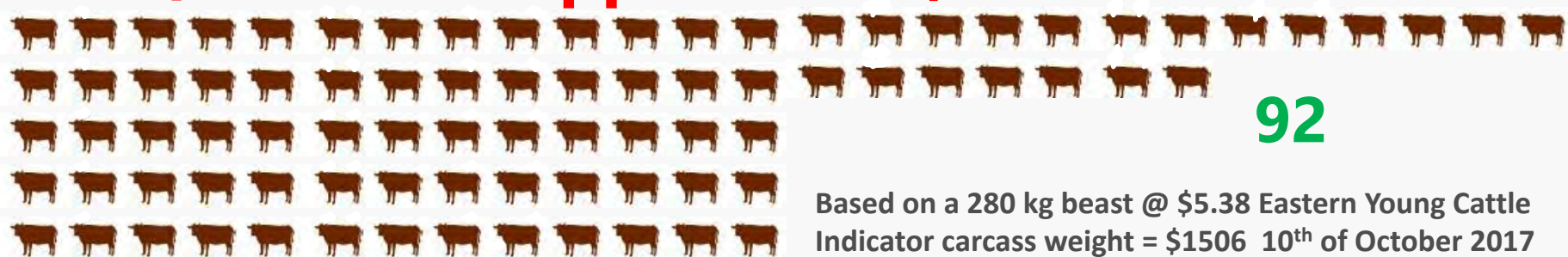
2008/2009 was approx \$41,000



2011/2012 was approx \$97,000



2014/2015 was approx \$139,000

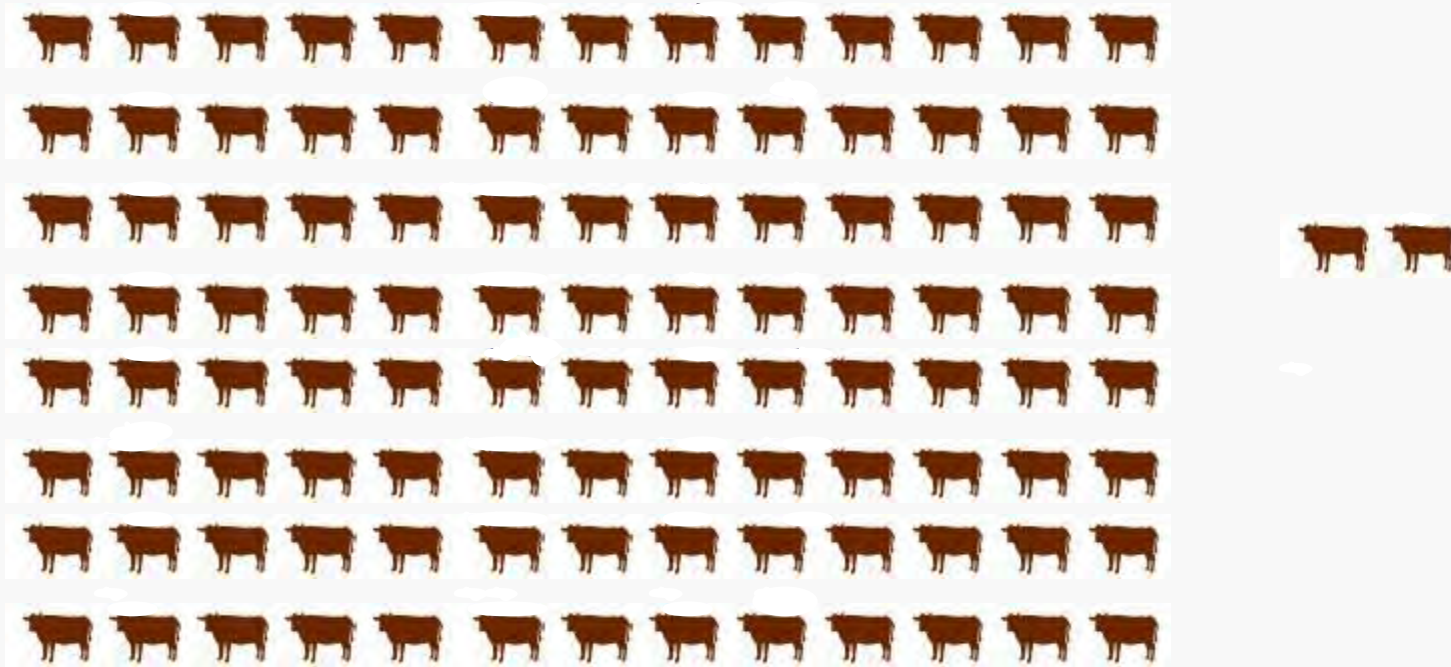


Based on a 280 kg beast @ \$5.38 Eastern Young Cattle
Indicator carcass weight = \$1506 10th of October 2017

Colebatch Cattle Producers Mains Water Costs

2017/2018 was approx \$148,280

106



Eased on a 280 kg beast @ \$5.38 Eastern Young Cattle Indicator
carcass weight = \$1506 10th of October 2017

Background Work Done



Championing Water Security Technology



Coorong District Council added 3 new photos — with Julianne Hein.

Posted by Tracey Strugnell

Yesterday at 10:30 AM · 🌐

The Coorong Tatiara LAP celebrated some real water security innovators in our district yesterday. Thanks to the landholders who opened up their properties, and to all who attended this targeted event. Inbox me for further information. (Tracey)



7 events
400 people in attendance
minimal advertising

Workshops and Field Days

Water Security Tours - March 2020 - save water, save \$

Friday 6th March - Coomandook
8.00am - 1.00pm
Friday 13th March - Policemans
Point 8.00am - 2.30pm

Please register by 3rd of March:
text on 0427 750 050 or
E: tstrugnell@coorong.sa.gov.au

Meeting at: Coomandook - Uniting Church Hall - Dukes Hwy
Policemans Point - Jacks Point Pelican Observatory - Princes Hwy

Lunch & morning tea provided

WHAT YOU WILL SEE?

- Airborne Logic - Drone mounted thermal camera technology for pipe leak detection
- BushLinX Controller Leak Detection and Water Shut Off Technology
- Alpha Group Leak Detection Technology & tank water level sensors
- Automated water blending technology, mixing ground & mains water
- Automated weather stations
- Lined Catchment / Water Harvesting (Policemans Point only)



This project is supported by the South East Natural Resources Management Board, through funding from the Australian Government's National Landcare Program



Water Security Tech Tour - Friday 26th March 2021

10.30am — 3.15pm

Save water - Save \$

Meeting at: Kondoric Windmill Yards
Woods Well Road (west end)

Registrations essential by Monday 22nd March:

Text: 0427 750 050 or

E: tstrugnell@coorong.sa.gov.au

Woods Well

Lunch & refreshments provided

WHAT YOU WILL SEE & HEAR?

- Visiting Three Lined Catchments - planning, building, lining & design alternatives
- Alpha Group water tech update; leak detection, tank water level sensors, flow meters, & more
- Solar Water Pumps Australia - will not burn out if the pump runs dry



This project is supported by the Limestone Coast Landscape Board, through funding from the Australian Government's National Landcare Program



Web Site and Fact Sheets

<https://www.coorong.sa.gov.au/council-services> Coorong Tatiara Local Action Plan



Fact Sheets include:

- Water Harvesting and Lined Catchments Planning Requirements for Piping Water and Water Harvesting & Lined Catchments
- Farm Water Infrastructure Tax Benefits & Rebates
- Farm Water Supply Pipelines
- Desalination for Livestock water supplies
- Best Practice to achieve a leak free service from on-farm pipelines & water reticulation systems
- Calculating Livestock Water Supply Needs
- Tanks & Roof Runoff

Water Catchment Drone Footage

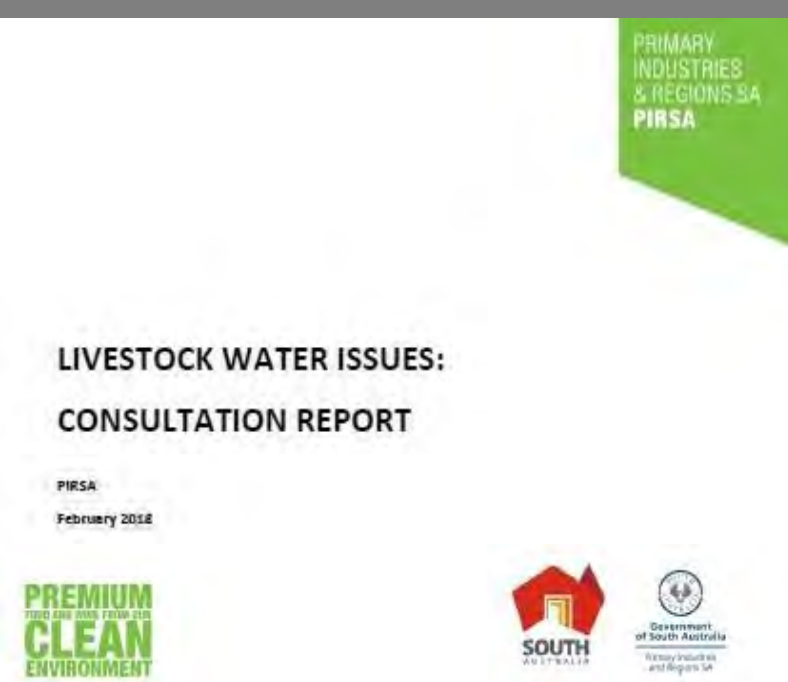


Technical Notes covering;

- Bushline Controller Leak Detection & Water Shut Off
- Leak Detection & Flow Meter Technology
- Drone Mounted Leak Finding Thermal Imaging
- Automatic Shandyng / Water Blending

Livestock Water Surveys

- Water Security Forum participant survey 2012 & 3 tour surveys
- Water Security Technology Survey 2015
- Coorong Water Transportation Scheme - Expression of Interest 2017
- On Farm Water Security Alternatives Survey 2017
- PIRSA Livestock Water Survey 2017



Interest in On Farm Water Security alternatives (non SA Water)

Landholders interested in installing lined catchments	30
Potential investment in lined catchments	\$3.9m - \$7.5m
Landholders interested in installing desalination	29
Potential investment in desalination	\$3.7m
Landholders interested in private pipeline projects	30
Potential investment in private pipeline projects	\$2.4m - \$16.3m
Landholders interested in leak detection units	70
Potential investment in leak detection units	\$105,000 - \$210,000

Third Party Access to SA Water Infrastructure

A Coorong Water Transportation Scheme



Moonee Hills Station
Cornish Graziers
Inghams SA
Garrison Cattle Feeders

Evolved from the 'Coorong Water Talks Forum' 2015

Third Party Access to SA Water Infrastructure

- Third Party Access is a Liberals SA policy
- This was attempted in 2017 through the extensive Coorong Water Transportation Scheme project
- Modelled on the Clare Peak Water Transportation Scheme
- This project was encouraged by SA Water
- Project funding came from Regions SA, Coorong District Council, Regional Development Australia, and four local livestock producers

The Water Security Options



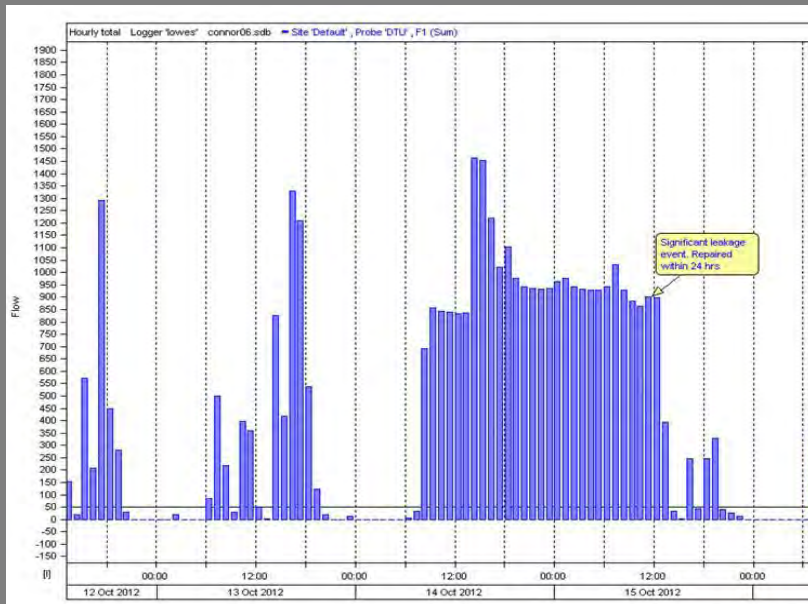
- **Leak Detection Units**
- **Leak finding**
- **Reducing On-farm Pipeline Pressure**
- **Piping water from off farm sources**
- **Upgrade On-farm Water Pipes & Infrastructure**
- **Desalinating Groundwater**
- **Shandyng Water – Mains, Bores, Lined Catchments, Lake & River**
- **Lined Catchments**
- **Telemetry**

Mains Water Leak Detection Project

- Water leaks on farm can cost in excess of \$10,000 are common
- More than 20% of mains water is lost through on farm leaks and overflowing tanks and troughs



Leak Detection Units



Finding Leaks Can Be Difficult



Leak Finding Equipment

Sonic
listening
devices



Drone mounted thermal
imaging camera



Reduce On-farm Pipeline Pressure



Piping Projects



**Piping water from Lake Albert or from a bore with fit
for purpose water Can be 15kms +**

Upgrade on farm water pipes



Be careful not to
damage the pipe

Use good
quality fittings



Use heavy duty pipe

- Green line 800kpa
- Blue line 1250kpa

Desalinating Groundwater



Considerations

Power - solar, mains or generators
Can be expensive

Reagent and membrane
replacement costs

Effluent disposal

Possible EPA approval

Water quality, eg salinity,
contaminates etc

Effluent disposal basin

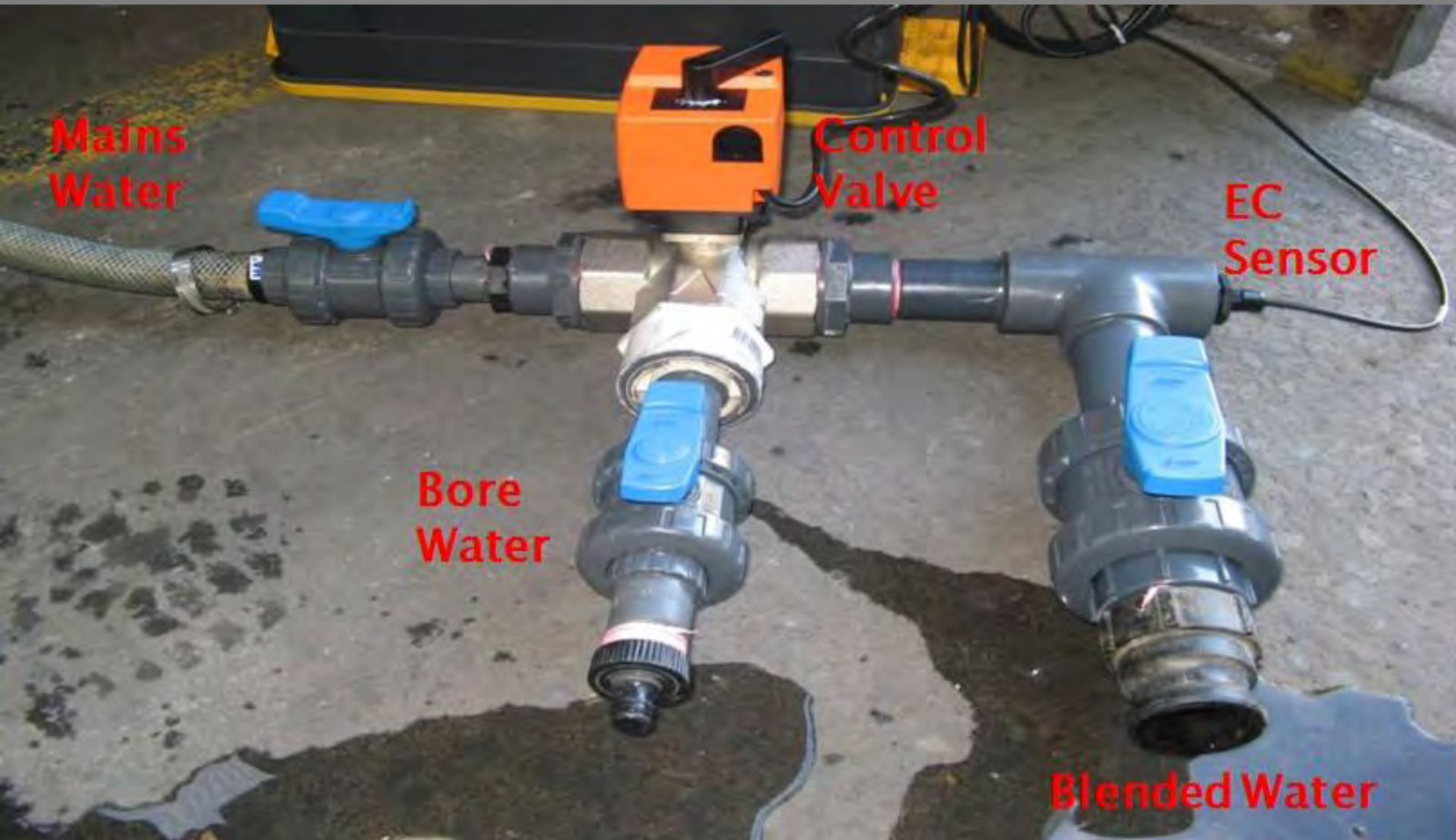


Shandying Water

Stock do not need distilled water or rain water so there is a potential to mix desalinated water, bore water, mains water and lined catchment water.

It just needs to be fit for purpose.

Shandyng Mains and Bore Water



Shandying Desalinated Water



Shandying desalinated water with bore water and rain water from large shed



Shandying Water From a Lined Catchment



Water pumped from the lined catchment dam

Brackish bore water

- Water shandied to 2,000 mg/l.
- System is alarmed.
- Note the telemetry on the top of the tanks.

Shandying Lake Albert Water and Groundwater



Lined Catchments



Lined Catchment Learnings

Funding Acknowledgement



**Government
of South Australia**

Primary Industries
and Regions SA

Regional Growth Fund

Coorong Lined Catchment Project

- Four lined catchments with a combined catchment area of 12.2 hectares
- Will catch 61 Megalitres of water
- The value of water captured is \$164,275 annually based on SA Water mains price of \$2.775 Kilolitre and 500mm rainfall

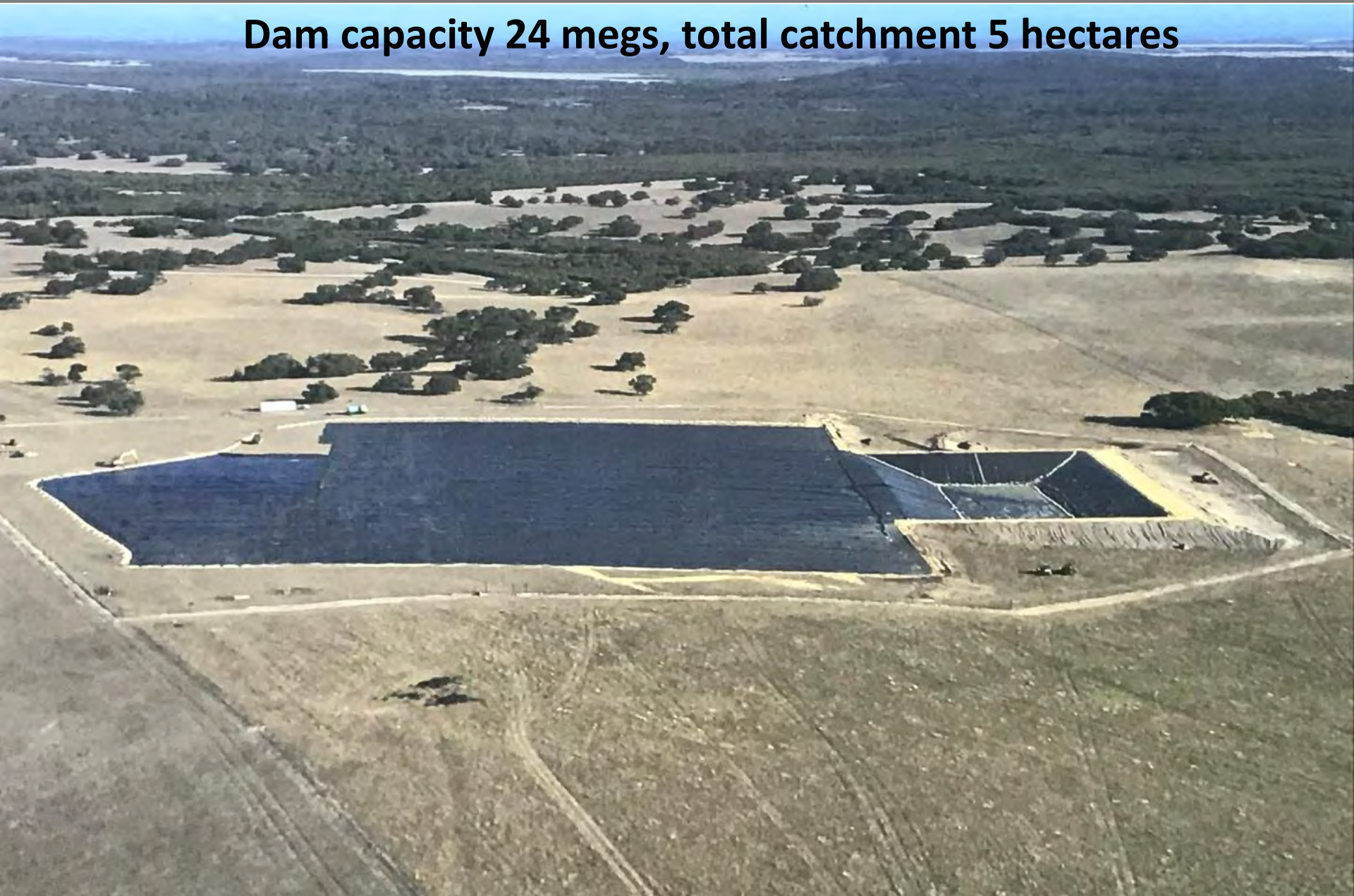
Coorong Lined Catchment Project

- Total cost of the 4 catchments & dams, including earthworks, liners, pumps, tanks, pipes, fencing etc is approx \$1.5m
- Costs ranged from \$230,000 to \$800,000
Costs varied significantly due to size, new infrastructure inc. pipes, troughs, tanks, telemetry etc

These costs don't include farmers labour and machinery

1. Salt Creek

Dam capacity 24 megs, total catchment 5 hectares



1. Salt Creek

07/08/2021 - Dam overflowing 24 megalitres



2. Woods Well

Dam capacity 15.1megs, total catchment 2.8ha



3. Woods Well

Dam capacity 11.5megs, total catchment 2.4 hectares



4. Woods Well

Dam capacity 9.4megs, total catchment 1.8ha



Policemans Point



Lined Catchment, Salt Creek

Field

Dam capacity 7megs, total catchment 1.54ha



Warranty On Liners

1.5mm poly liner has a 20 years warranty

1.0mm poly liner has a 10 years warranty

All 8 dams are 1.5mm poly

6 of the catchments are 1.5mm poly

2 of the catchments are 1mm poly



Evaporation

- Allow for evaporation when calculating the capacity of the dam
- Likely to be 1.4 to 1.7 meters annually
- Dam covers are very expensive. A floating cover for a 2ha dam is likely to be over \$100,000
- It is much cheaper to make the dam bigger to compensate for evaporation
- A deeper dam with less surface area is best

Fencing



Coorong District Council Development approval condition:

Following construction, the site must be securely fenced with a 1.8 m high fence and a locked gate

DEVELOPMENT PLAN CONSENT CONDITIONS: (CDC cost \$693.00)

- (1) The development may proceed in accordance with the stamped approved plans and details submitted with the application and contained in Development Application 571- 121-19 except where varied by the conditions below (if any).

Reason To ensure that the development is undertaken in accordance with the application details.

The following conditions (2) – (11) have been imposed at the direction of the Department for Environment and Water - Natural Resources South East:

- (2) The dam must be constructed to a water holding capacity of no more than 23,000 kilolitres (23 megalitres).
- (3) The dam must not be constructed to intersect groundwater or have a finished base below any groundwater water table.
- (4) The dam must be constructed in such a manner that prevents water leaking into the groundwater table, by lining the dam with 1.5 mm thick high density polyethylene (HDPE).
- (5) The spillway must be constructed to cater for a 1% Annual Exceedance Probability. Overflow from the dam must not cause soil erosion.
- (6) Any work must not increase the risk of flooding.
- (7) There must be a minimum distance of 20 metres between any water features (including wetlands, watercourses, drains) or wells and the fuelling site for machinery used to undertake the construction of the dam.
- (8) The works must be undertaken in a manner that prevents silt or sediment leaving the site.
- (9) The proposed works must not have a detrimental impact on any nearby trees.
- (10) To minimise erosion, the dam walls and all other disturbed areas must be vegetated with suitable perennial pasture species.
- (11) Following construction, the site must be securely fenced with a 1.8 m high fence and a locked gate.

Monitoring Telemetry



Telemetry is being used for:

- Leak detection
- Tank sensors
- Salinity level alarms
- Remote pump start-up and stop
- Valve shut offs
- Monitoring cameras
- Soil temperature probes
- Ground water monitoring
- Automatic weather stations

Pros and Cons

Water Security Options

Leak Detection Units

PROS:

- Significant savings of mains water
- Reduced reliance on River Murray Water
- Relatively cheap and easy to install
- Locally manufactured & serviced
- Data available on-line or via text
- Tax incentives for construction costs

CONS:

- A unit is needed for each SA Water meter
- Need mobile phone reception
- Leaks can be very difficult to find

Reducing On-farm Pipeline Pressure

PROS:

- Pressure reducers and pressure gages are cheap and easy to install
- Reduces leaks, particularly with low grade poly pipe
- Tax incentives for construction costs

CONS:

- Need to closely monitor water infrastructure and regularly check pressure gauge

Piping Water From Off-farm Sources, eg Bore, Lake, River

PROS:

- Significant mains water savings
- Shandyng opportunities with mains or bore water
- Reduced reliance on River Murray Water
- Tax incentives for construction costs
- Improved land values
- Asset attached to land

CONS:

- Cost of pipeline and instillation
- Approvals for laying pipes on road and road crossings
- Native veg clearance on road reserves
- Many landholders under estimated the size of the pipes and pumps needed
- Reliability of input water source?

Upgrade On-farm Water Pipes & Infrastructure

PROS:

- Can significantly reduce leaks
- Less time spent on maintenance
- Less time spent on leak finding
- Tax incentives for construction costs
- Improved land values

CONS:

- Cost of the pipes, tanks and troughs
- Instillation time and costs

Desalinating Groundwater

PROS:

- Can reduce costs of water to less than \$1.00/kl
- Shandyng opportunity can reduce infrastructure costs or increase output
- Reduced reliance on Murray Water
- Improved stock health & production
- Improved land values, asset on land
- Tax incentives for construction costs
- Reliability of input water

CONS:

- Ongoing costs of membranes and reagents
- Power requirements needs either mains, generator or large bank of solar panels
- Effluent disposal
- EPA approvals?
- Water quality and water contaminates can be a limiting factor

Shandyng Water

PROS:

- Can use groundwater, mains, bores, lined catchments, lake & river water
- Relatively cheap, significant savings
- Tax incentives for installation costs

CONS:

- Monitoring needed to prevent layering
- Water needs to be mixed thoroughly to prevent stock losses

Telemetry

PROS:

- Very significant time savings,
- Detects leaks and overflowing tanks & troughs.
- Can be viewed and operated from almost anywhere.
- Remotely turn valves on and off.
- Alarms for salinity, tank levels etc.

CONS:

- Initial cost.
- Stock damage if not protected.
- Theft of solar panels & electronics.
- Lack of mobile phone coverage.

Lined Catchments

PROS:

- Very little maintenance and long warranty on poly liners.
- Shandying can increase output and reduce construction costs.
- Reduced reliance on Murray Water.
- Tax incentives for construction costs.
- Improved stock health & production.
- Improved land values, asset with land

CONS:

- Initial construction costs.
- Algae control.
- Development applications & approvals.

A Few Final Points When Planning and Constructing a Lined Catchment

- When selecting the site (and fencing it) make sure there is sufficient room to expand the catchment area in future
- Make sure there are ladders installed in the dam, as it can be difficult to get out
- Investigate the option of shandyng water when planning the project, it may reduce construction costs
- Avoid installing catchments on steep ground. A very gentle slope is sufficient (tyres can wash into the dam)
- Consider the warranty on the liner when planning the project
- Generally landholders have under estimated the amount of tyres required to hold down the liner