

Menindee Lakes

POLICY

130307

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Introduction

NSW Irrigators' Council (NSWIC) represents more than 12,000 irrigation farmers across NSW. These irrigators are on regulated, unregulated and groundwater systems. Our members include valley water user associations, food and fibre groups, irrigation corporations and commodity groups from the rice, cotton, dairy and horticultural industries.

This document represents the views of the members of NSWIC. However each member reserves the right to an independent view on issues that directly relate to their areas of operation, or expertise, or any other issues that they may deem relevant.

Executive Summary

This document sets out the policy of NSWIC in respect of infrastructure and management options at the Menindee Lakes system on the Darling River.

This issue has sat in the background of the water policy debate for many years - practically since the Menindee Lakes Storage Scheme was constructed. Due to a range of factors, its efficiency could be considerably improved. NSWIC has long supported efficiency works at the system and continues that support.

Whilst providing a background on the system, its operation and considering some of the proposals mooted for the system, this document is designed to address the *principles* that must be considered when addressing any such proposal. These principles for addressing any proposal are the fundamental core of this document.

In July of 2012, NSWIC adopted the following motion:

That NSWIC develop a policy on the issue of how SDL credits from a Menindee Lakes reform are allocated.

Along with providing significant background on the system, considerations to date, the positions of others and a preliminary consideration of mooted works and measures, the crux of this document in an answer to the key component of July motion:

Any savings achieved from efficiency works should be shared based on the 'no negative third party impact' criteria determined by Council.

Background

The Menindee Lakes system is a crucial component of the Murray-Darling Basin. It is one of the four main storages that form the basis of regulated flows in the Lower Darling and Murray River systems. In conjunction with Dartmouth, Hume and Lake Victoria, it underpins water allocations across New South Wales, Victoria and South Australia.

Operations of the Menindee Lakes are subject to the Murray-Darling Basin Agreement, an Inter Governmental Agreement between Basin States and the Commonwealth (now annexed to the Commonwealth *Water Act*).

Water Access License (WAL) holders upstream of the Lakes are affected by their operation given that water into the Lakes must come from that region. In particular, access in many upstream systems is suspended when storage levels in the Lakes drop below certain thresholds. WAL holders downstream are affected given that water coming from the Lakes both underpins their allocations (particularly on the lower Darling) and assists in maintaining the reliability of their allocations.

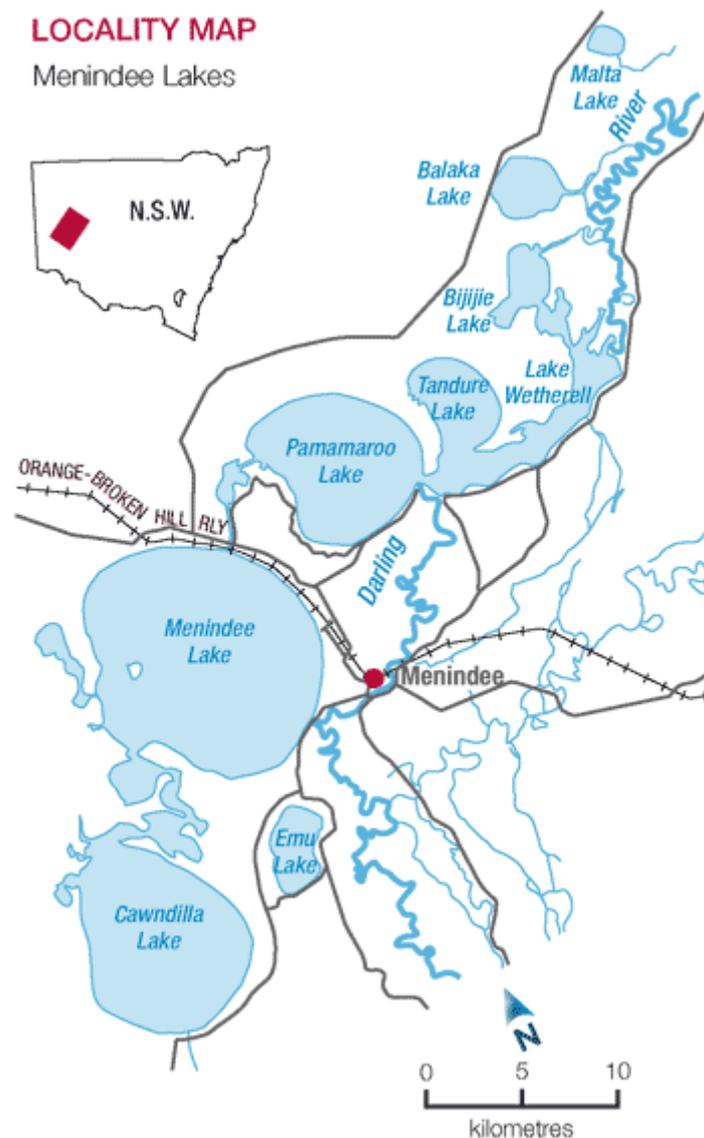
Further, the Lakes provide options for NSW and Victoria to meet flows into the South Australian Murray.

In seasons with high allocations the Murray channel lacks the capacity to supply South Australia together with NSW and Victoria. Flow over the Mildura Weir can cease. Whilst Lake Victoria, as a mid-river storage, can assist, it lacks the capacity and flow rates to lower levels to overcome the restriction. In the absence of flow from Menindee, irrigation supply in Victoria and NSW may be restricted or ceased, a situation which has previously occurred.

Location

The Menindee Lakes system is in the far west of NSW around 100km south east of Broken Hill.

The closest town is Menindee, positioned between the Lakes and the Darling River. They are located on the Darling River and effectively separate the northern and southern Murray-Darling Basin.



The Lakes

There are 19 relatively shallow Lakes that form the group. They are naturally occurring but the storage system is a result of engineering intervention.

Prior to the development of the storage system, the Lakes connected to the Darling River via short creeks which generally only filled in flood conditions. As floods receded, some water would return to the Darling system whilst significant volumes would evaporate leaving a series of smaller pools. The Lakes did at times dry out completely.

The southern most of the Lakes is Tandou, which is now used as irrigated cropping land. A string of further lakes occurs along the Darling Anabrach to the Murray River. A number of these lakes are used for opportunity cropping.

Storage System

Four of the Lakes - Wetherell, Pamamaroo, Menindee and Cawndilla - have been configured to provide water storage. That is, they are natural lakes that have been augmented by the construction of regulating works.

Small, interconnected Lakes - Copi Hollow, Eurobilli, Tandure, Bijijie, Balaka and Malta - join with the main four to create the Menindee Lakes Water Storage Scheme.

Lakes Cawndilla and Menindee are within the Kinchega National Park.

The State Water website notes that the purpose at the time of construction was to:

- secure water for Broken Hill;
- provide water for irrigation and farming in the Lower Darling down to Wentworth;
- meet the stock and domestic requirements of the Great Darling Anabranch; and
- supplement resources of the River Murray system, including supply to South Australia.

The availability of water in this section of the Murray-Darling Basin is highly variable. The system can - and does - vary between surcharged (storage greater than nominal capacity) and empty (to the extent that temporary works are installed to access "dead" storage").

Technical Detail

The Lakes lie in a semi-arid zone and are comprised mainly of grey clay and siliceous and calcareous sand. Their margins are studded with dead black box with the shores dominated by canegrass.

The Menindee Main Weir was commissioned in 1960, upgraded in 1968 and further upgraded (decking and electrical works) in 2007. It's height is 11.5 metres with a crest length of 85 metres. It allows the storage of water in the Wetherell system and the diversion of water to Lake Pamamaroo which in turn provides access to Lakes Menindee and Cawndilla.

The system is comprised of a number of weirs, regulators, levees and channels.

The combined storage capacity of the Lakes is 1,730 gigalitres, but they can be surcharged to 2,050 gigalitres during floods. The system covers some 463 square kilometres.

The outlet capacity from each of the radial type regulators in Wetherell, Pamamaroo and Menindee is (at design capacity) 5,000 megalitres per day. In practice this rarely exceeds 3,000 megalitres per day as release rates vary depending on storage height and location. The channel capacity of the Lower Darling River is 9,000 megalitres per day (after which overbank events will occur) but the main weir must be utilised to achieve this.

The 9,000 megalitre flow rate is targeted when the system is under MDBA control to minimise transmission losses when water is supplied to the Murray system. As the level decreases, releases can be made from upper Lakes (usually Pamamaroo and through the main Weir) to achieve the full 9,000 megalitres.

In practice, Cawndilla, Menindee and Pamamaroo are drawn down in parallel, which is part of the efficiency problem in that surface area is not minimised. Due to topography, the problem is often with achieving head differences to release water and hence a designed flow volume may not be readily achievable.

Ownership and Management

Whilst built and owned by NSW, the Lakes are jointly managed by the NSW Department (currently NOW), the Murray-Darling Basin Authority and State Water. Control of releases is undertaken by the MDBA until the total water storage drops below 480 gigalitres. At this point, both control of releases *and* the volume in storage pass to NSW. It stays in that jurisdiction until storages increase to greater than 640 gigalitres.

It is difficult to gain a complete understanding of why these management thresholds (640/480) were set. We understand that 480 gigalitres was considered the volume that enabled provision for the far west of NSW during a modelled drought (which was based on 1917). 640 gigalitres was considered, we understand, to represent the volume that would be required for an extra year above the 480 gigalitre threshold.

The rules date from the 1970's when they were specifically designed as a drought reserve for the use of NSW in the Lower Darling. Recent history has shown that the modelling to calculate these drought reserve figures was not correct. It is important to note that their sole purpose was - and remains - a drought reserve for NSW use. In the recent drought, the reserve was used to underpin NSW Murray allocations.

The rules refer to total storage and make no discrimination between available and dead storage; or the location of water within the system.

In practice, the rules do not affect Darling tributaries - it is the threshold at which the Menindee and Darling system is "removed" from the shared resources of the Murray for connected States. The effect on Darling tributaries occurs when low critical human needs water supplies fall below 21 months.

640 gigalitres is also marginally above the surcharged capacity of the upper storages (Weatherell and Pamamaroo). That is, NSW maintains control when storages are being refilled until the point, in practice, when internal spills to Menindee and Cawndilla commence. We understand that it is merely coincidental that this volume roughly equates to the upper threshold volume.

On all MDBA controlled storages, NSW and Victoria hold equal air space. Both States are obliged to supply flows to South Australia as per the MDB Agreement from their individual accounts. They must make these allowances before allocations can be made in their respective state.

Dead storage volumes in Menindee and Cawndilla are considerable. In Lake Menindee, around 80 gigalitres is considered unusable (or "dead") storage as it cannot be diverted back to the Darling. The figure in Cawndilla is greater (perhaps up to 200 gigalitres), but varies depending on definition. Whilst absolute dead storage (that which cannot be diverted out of the lake at all) is relatively low, a significant volume cannot be returned to the Darling. Menindee and Cawndilla are connected in the absence of a regulatory structure and hence can only be filled and drawn down in parallel. Sill level (the level at which Cawndilla becomes disconnected from Menindee) is reached with approximately 200 gigalitres remaining in Cawndilla. This water cannot be returned to the Darling - it can only be drawn through the Cawndilla outlet to service the Darling Anabranch or Tandou Farms. To that extent, it can also be considered largely "dead" in respect of the Darling and, further, the Basin.

From a practical viewpoint, management of the system such that all water is kept in the upper storages when possible means there is no need to account for the dead storage in Menindee and Cawndilla.

Environmental Value

The system is, in itself, a significant environmental asset. It is a particularly valuable area for birdlife and fish species as both a drought refuge and as a breeding location. NOW claims that, when full, the system supports more bird species than Kakadu.

The storage system has seen the Lakes dry out less than they would in a natural sequence, leading to a change in environmental conditions. A constant flow regime enabled by the storage has also materially changed the Lower Darling.

The Lakes are listed on the Directory of Important Wetlands, water birds listed on the Commonwealth *Environmental Protection and Biodiversity Conservation Act* (1999) occupy several of the Lakes, six species listed in the NSW *Threatened Species Conservation Act* (1995) are present and several migratory species listed under the Japan-Australian Migratory Bird Agreement (JAMBA) and the China-Australia Migratory Bird Agreement (CAMBA) have been sited. Many of the Lakes have also been listed by the Murray-Darling Basin Authority as key environmental assets and have been used as hydrological indicator sites.

Cultural Heritage Value

NSWIC recognises that the system and surrounds hold significant cultural heritage value. Aboriginal leaders note several important sites around the Lakes as well as the Lakes themselves that must be considered in any management or infrastructure changes.

Further, modern cultural and social implications must be considered, including the social value of amenity at both Copi Hollow and Sunset Strip.

Great Darling Anabranh

Around 55 kilometres south of Menindee, the Darling spills into the Great Darling Anabranh. As well as the bed of the Anabranh, some 16 lakes occur. During flood, the entire area becomes a water bird and fish habitat. The Anabranh also received backwater flows where it joins the Murray to the west of Wentworth. Where volumes in the lower Darling exceed 12,000 megalitres per day, spills from the main channel into the Anabranh can occur although significant flow to the main Anabranh channel requires around 14,000 megalitres per day. Outflows from Cawndilla also flow to the Anabranh but are limited by channel capacity to around 2,000 megalitres per day.

Works completed in 2011 delivered a stock and domestic supply to landholders on the Anabranh resulting in significant conveyance loss savings. These savings resulted in environmental entitlements that contributed to the NSW requirements of The Living Murray. It should be noted that stakeholders remain concerned that the entitlements represent a significantly higher reliability than the savings justified.

Evaporation Losses and Possible Savings

Somewhere between 393 gigalitres (Webb McKeown, 2007) and 426 gigalitres (NOW website) gigalitres is lost in evaporation from the system annually. The difference stems largely from the length of the modelling period, with the latter being accurate past 100 years. When the Lakes are full, the figure can increase to beyond 700 gigalitres. Monthly figures can peak at 110 gigalitres for January alone.

Of course, evaporation losses do not occur (or are greatly reduced) when the Lakes are dry or only hold dead storage, such as with Menindee and Cawndilla between 2002 and 2010.

The NSW Government claims to have been investigating structural works and management changes since prior to 1995. The issue is complicated by competing demands and considerations, including human needs both near and far, water users both upstream and downstream, environmental issues both near and far, cultural heritage values, recreation and regional tourism issues and political considerations.

Broken Hill

The system provides the water supply for the town of Broken Hill. A pipeline runs to the Darling where the offtake sits above Weir 32 (which also provides the weir pool for supply to the town of Menindee). A pumping station at Lake Menindee near the inlet from Copi Hollow was built during the millennium drought, but was not used largely due to water quality issues. Investigations were also undertaken for an offtake at the highly reliable Copi Hollow, but the area was dropped as a storage due to water quality issues.

The rules currently require 21 months of supply to be stored. When storage drops to below 18 months, supplementary extractions upstream are restricted to restore the requirement. In conjunction with this, the Darling River is "turned off" at Weir 32 meaning no stock and domestic water or irrigation is available downstream of Menindee, including for the town of Pooncarie.

Identification of Options

A number of studies across several decades have considered infrastructure and rule change options to operate the system more efficiently.

The NSW and Commonwealth Governments jointly funded a feasibility study to identify substantial water savings in the Darling River system, to include the Menindee Lakes. The outcome was to be a 20 year strategic plan to achieve savings "based on an integrated approach of structural works, river and storage operating strategies and water market activities".

The project was to be in two parts - the first to generate and screen a large number of options and the second to develop a short list and preferred options.

Maunsell published what is known as "The Part A Report" in April of 2007 ([here](#)). It identified 6 primary schemes for consideration:

(i)	Reduced use of Lake Menindee	120 gigs
(ii)	Reduced use of Lake Cawndilla	60 gigs
(iii)	Reduced use of both Menindee and Cawndilla	180 gigs
(iv)	Partition Menindee / reduce Cawndilla	130 gigs
(v)	Partition Menindee	70 gigs
(vi)	Rapid drawdown of Menindee	60 gigs

Later that year, soon to be Prime Minister Kevin Rudd announced some \$400m would be made available to infrastructure works "to reduce evaporation and improve water efficiency at Menindee Lakes" which would "return up to 200" gigitalitres. The policy document is [here](#).

In March of 2010, SKM published what is known as "The Part B Report" ([here](#)). It also considered 6 options ("schemes"), although they were marginally different to those in Part A. Each of the schemes involves storing water for shorter period; keeping the Lakes lower for longer. The obvious implication is less loss through evaporation, but significant environmental impacts occur and the reliability of downstream supply is

also eroded. 100 gigalitres was determined as a critical figure and, as such, the percentage of times total storage would be below this was used as a key determinative criteria. The current situation sees this at 2%

Note that each options required alternative storage of Broken Hill water supply. Further, rule changes and infrastructure construction were considered as a requirement of several options.

The six schemes considered were:

1. Never Fill Menindee and Cawndilla

This option used existing structures (plus a drainage channel at Lake Pamamaroo).

640/480 is reduced to 150/100.

Savings of 248 gigs are nominated with 165 gigs increase to Murray.

Total storage drops below 100 gigs 18% of the time.

Lifecycle cost is \$2.9m

2. Reduce Use of Menindee and Cawndilla

This option used existing structures (plus a drainage channel at Lake Pamamaroo).

640/480 is reduced to 210/200.

Savings of 125 gigs are nominated with 71 gigs increase to Murray.

Total storage drops below 100 gigs 7% of the time.

Lifecycle cost is \$2.9m

3. Reduce Use of Menindee and Cawndilla

This option used new structures (Lake Pamamaroo drainage channel; Morton Boolka regulator; enlarged Menindee regulator, outlet and drainage channel; enlarged Cawndilla outlet and drainage channel).

640/480 is reduced to 210/200.

Savings of 125 gigs are nominated with 71 gigs increase to Murray.

Total storage drops below 100 gigs 7% of the time.

Lifecycle cost is \$70.9m

4. Reduce Use of Cawndilla

This option used existing structures plus a drainage channel at Lake Pamamaroo and the Morton Boolka regulator.

640/480 is reduced to 210/200.

Savings of 61 gigs are nominated with 30 gigs increase to Murray.

Total storage drops below 100 gigs 7% of the time.

Lifecycle cost is \$18.6m

5. Reduce Use of Cawndilla

This option used new structures as in option 3.

640/480 is reduced to 210/200.

Savings of 74 gigs are nominated with 27 gigs increase to Murray.

Total storage drops below 100 gigs 7% of the time.

Lifecycle cost is \$70.9m

6. Reduce Use of Cawndilla

This option used new structures as in option 3.

640/480 is unchanged.

Savings of 34 gigs are nominated with 2 gigs increase to Murray.

Total storage drops below 100 gigs 2% of the time.

Lifecycle cost is \$70.9m

Note that each involves drying of one or more Lakes. The report notes *it is very likely that there would be some requirement for environmental filling of any lakes with reduced operational use*. That is, environmental water would need to be diverted *back* to the Lakes.

On a cost/benefit analysis, the Report concludes that option 1 is superior and option 6 is inferior. The options are listed in cost/benefit preferential order.

Note that the report identifies that modelling runs on option 1 came perilously close to being unable to supply Lower Darling entitlements. The situation was resolved only through significant and timely inflows in the model run.

NSWIC is disappointed that stakeholders - particularly local stakeholders with key knowledge - were not properly engaged in developing the reports.

NSWIC is concerned that technical flaws within both the Part A and Part B reports in respect of both the modelling and cost benefit analysis have occurred. These should be reviewed - in conjunction with stakeholders - prior to finalising a preferred suite of options.

July 2010 Memorandum of Understanding

The then-NSW Government and the Commonwealth signed an MoU in July 2010 indicating that they would jointly investigate preferred options ([here](#)). A number of caveats were inserted against further action;

- i. An alternative storage for Broken Hill had to be found;
- ii. "no directly attributable adverse impact on the water security of existing entitlement holders at Menindee Lakes and the Lower Darling River, or the Murray River";
- iii. Savings would be converted to entitlements and "if necessary" recognised in the Murray-Lower Darling WSP;
- iv. Shepherding would be enabled;
- v. If the savings were less than 200 gigs, the funding would be proportionally reduced.

On the basis of "200 gigs savings", it could be assumed the option 1 was the Commonwealth preference.

In June 2011 the new NSW Government withdrew from the MoU citing three reasons;

- the Broken Hill community opposed the aquifer recharge proposal to secure their water supply on the basis of cost and water quality;
- downstream reliability in dry years would have been affected; and
- shutting down two Lakes would have had significant environmental and social impacts.

External Parties Current Positions

A paper published by NOW in April 2012 ([here](#)) is scathing of the Commonwealth and the impacts under option 1. The paper concluded:

The NSW Government will continue to work with the Commonwealth to progress these options, but it is not prepared to compromise the enormous water supply benefits provided to all states and the natural values of the Menindee Lakes, to meet unspecified environmental objectives downstream.

The Commonwealth contends that it has provided funds to progress work on all options and that it has "moved on" from focusing on option 1.

Access by Tandou

Lake Cawndilla is highly significant for Tandou Farms, who draw the majority of their entitlement directly from that storage. Tandou notes that any change to storage arrangements that see Cawndilla used less will have a material effect on their capacity to draw entitlement. Opportunity exists for the use of Pinnelco Channel from the Darling, but financial impost will occur as water from that source must be pumped.

Policy of NSW Irrigators Council

NSWIC has encouraged governments at both State and Commonwealth level to invest in efficiency infrastructure at Menindee at the earliest opportunity. We are disappointed that advantage was not taken of the recent dry situation at the Lakes, resulting in the further loss of significant volumes of water.

We have welcomed the commitment of funding from the Commonwealth several years ago, but now need to see those funds applied to real works.

In short, the time has come to act.

The key issue is evaporation. We must engage measures to minimise evaporation. This will be through a combination of physical works as well as changes to operating rules.

Assessing Proposed Changes

NSWIC is acutely aware that changes at Menindee have potential to impact third party users both up and downstream. We believe that any proposal must be the subject of extensive consultation with groups representing those users - including NSWIC - to ensure that benefits are shared and negative implications are either eliminated or mitigated and offset.

Treatment of Savings

To a significant extent, the current Basin Plan process treats the northern and southern Basin as separate systems. In particular, "shared reduction" targets are specific to those two artificial constructs.

NSWIC is aware of debate and discussion as to where savings ought be allocated - against the southern or northern shared reductions (or, indeed, to the in stream reductions in the Darling).

It is the position of NSWIC that savings must be shared in accordance with the criteria overleaf - particularly the "no negative third party impacts" criteria. Details in respect of how sharing is to be achieved can only be considered against detailed project proposals.

Criteria to be Considered

NSWIC believes that any and all proposed changes - be they to physical infrastructure or to the rules under which the system is operated - must be assessed against the following broad criteria. These criteria are not exhaustive. Each and every proposal will, by nature, have its own intricacies which must also be considered through extensive consultation.

Criteria One - Efficient Capture, Storage and Management

NSWIC believes that change for the sake of change or to meet regulatory targets alone is not warranted and must be avoided. The problem to be addressed at Menindee is with respect to efficiency of capture and storage of water together with its management. With that in mind, NSWIC believes that all proposals for change must be assessed against a criteria to ensure efficiency of capture, storage and management. Any proposal that does not increase this capacity must be viewed negatively in the first instance.

Criteria Two - No Negative Third Party Impacts

Any change to the infrastructure or operation of the Lakes will necessarily result in third party impacts. NSWIC believes that *negative* third party impacts must not occur.

Negative impacts may occur in a number of ways, including (but not limited to) impacts on access *per se*, reliability of access, volume of water available and inundation above and beyond that which currently occurs (both frequency and extent).

In limited circumstances, offset of third party impacts may be acceptable subject to agreement with those affected. Offset may include alternative access arrangements or compensation in various forms.

Criteria Three - Meaningful Consultation with Potentially Affected Parties

NSWIC is keenly aware that any changes to the Menindee system, be they physical infrastructure or operating rules, have the potential to create possibly unforeseen impacts. As a result, any proposed change must be the subject of extensive consultation with Water Access License holders both up and downstream.

Consultation must be in accordance with the NSWIC *Consultation Expectations Policy*, a copy of which is available on our website.

Criteria Four - Robust Information and Data

NSWIC believes it is imperative that all proposals be made, assessed and examined against data and information that is robust, accurate and publicly available. Specifically, any and all assumptions used expressly or in models must be detailed and subject to external scrutiny.

A Package of Works and Operational Changes

NSWIC does not believe that one single measure will create the most efficient system. We recognise that a range of proposals have been put and that a package of them will most likely provide the best outcome.

The proposals noted below are not put by NSWIC. These proposals have been put by others - including Government agencies. Many appear in the various reports referred to earlier in this document.

NSWIC does not specifically endorse any of the projects below at this stage. Should any be formally proposed by governments, we will assess the proposal and provide a formal position on it.

Each of the proposals below is given an informal, preliminary assessment against criteria two and three as detailed above (criteria one being a requirement for consultation).

Menindee Outlet Regulator

The outlet regulator from Lake Menindee is currently constrained to approximately 4,000 megalitres per day, although this varies with storage height. The most efficient downstream flows are those which minimise losses. We understand that figure to be around 9,000 megalitres per day. The result of this combination is that drawdown must occur from both Lake Menindee *and* the upper storages (Pamamaroo and Weatherell) contemporaneously.

It is clearly inefficient to draw from the most efficient and least efficient storages at the same time. As a general principle, NSWIC believes that the least efficient storages must be used first, and draw downs from those more efficient storages should be the last to occur.

Criteria One *This change should result in material efficiency.*

Criteria Two *Any change must provide assurance that total outflows and patterns will not alter, therefore providing no additional third party impact.*

Broken Hill Secure Supply

NSWIC recognises that the water supply - both availability and quality thereof - for Broken Hill is a key consideration. The identification and consideration of an efficient storage dedicated to underpinning that supply seems practical. Rules in respect of delivery from upstream to meet the Broken Hill security requirements are a key concern for irrigators in that region, who have a specific interest in this issue being addressed.

It should be noted that stock and domestic supplies in the Lower Darling and town water for Pooncarrie remain a high priority.

Criteria One This change should result in material efficiency.

Criteria Two Third party impacts can only be determined when a solid proposal is put.

Morton Boolka Regulator

At present, Lakes Menindee and Cawndilla must be filled and drawn down in parallel. The two intersect at the Morton Boolka swamp. The result of such parallel operation is to essentially double the surface area of the storage thereby significantly exacerbating the evaporation occurrence.

NSWIC understands that a regulator at Morton Boolka would allow Lake Menindee to be filled when the upper Lakes are already full and for Lake Cawndilla to be filled only when everything else is full.

Criteria One This change should result in material efficiency.

Criteria Two Third party impacts to irrigators drawing from Lake Cawndilla would likely occur and must be addressed.

Upstream Lakes Regulators

Segregating the upstream storage system to enable serial rather than parallel use has been mooted in concept but has not, to the understanding of NSWIC, been fully detailed at this stage. We understand that investigation of regulators on smaller lakes within the Weatherell system may allow further development of segregation with a resultant saving in evaporation.

Criteria One This change should result in material efficiency.

Criteria Two Third party impacts can only be determined when a solid proposal is put.

Change Use of Cawndilla

NSWIC understands that Lake Cawndilla is a more efficient storage than Lake Menindee in that its volume to surface area ratio is lower and its depth is far greater than Menindee. It may make logical sense to use Cawndilla as storage ahead of Menindee.

To do so, two further infrastructure challenges must be met - the capacity to deliver water to Cawndilla without filling Menindee and the capacity to return water from Cawndilla to the Darling River.

Criteria One This change should result in material efficiency.

Criteria Two Third party impacts can only be determined when a solid proposal is put.

Murray Pipeline for Broken Hill

NSWIC understands that consideration was given during the development of the Darling Anabranh stock and domestic pipeline to an extension (at a larger capacity) to supply Broken Hill from the Murray. The current pipeline from Menindee, like all physical infrastructure, has a limited lifespan.

Criteria One Consideration of efficiency dividends would need to be undertaken.

Criteria Two Third party impacts can only be determined when a solid proposal is put.

A Package of Rules Changes

NSWIC recognises that savings volumes from infrastructure alone may not justify the expense of the works, but notes that changes to operating and management rules associated with such infrastructure may create the opportunity to maximise benefits for all.

NSWIC does not approach or accept rules changes lightly, recognising that impacts are certain to occur and that those impacts can be unforeseeable. For clarity, NSWIC is not recommending or endorsing *any* rule changes pursuant to this document. We are prepared to *consider* change, but will approach any such change with the utmost caution and recognition that impacts to stakeholders must be carefully considered. The criteria determined earlier must equally apply to proposed rule changes.

NSWIC is prepared to work with both State and Commonwealth Governments to identify sensible rules changes that can augment savings gained from infrastructure investment.

Review of 640 / 480

The addition of the Morton Boolka regulator and the augmentation of the Menindee outlet regulator may allow the system to deliver the same volume of water with less evaporation losses thereby creating savings. In particular, the 480 gigalitre threshold may be able to be lowered in the presence of efficient infrastructure as less water is required to meet NSW needs in dry times.

Criteria One *Consideration of efficiency dividends would need to be undertaken once a solid proposal is put.*

Criteria Two *Third party impacts can only be determined when a solid proposal is put. NSWIC believes that significant and possibly indeterminate third party impacts may occur and hence significant consideration would be required prior to implementation.*

Treatment of Dead Storage

The Menindee Lakes are considered an important environmental asset. Their watering at the moment comes as an adjunct of the storage of productive water. Noting that "free rides" for users across the Basin have become anathema to policy makers, NSWIC believes that the first water delivered into Lakes Menindee and Cawndilla after a dry period should be debited to environmental accounts. The debit should be to an agreed level of immediate seepage due to re-wetting plus that volume which cannot be returned to the Darling system.

Criteria One *Environmental efficiency may be better understood.*

Criteria Two *Third party impacts can only be determined when a solid proposal is put.*

Review of Murray-Darling Agreement

NSWIC is prepared to engage in a full review of the Murray-Darling Agreement, many of the rules of which are either directly or tangentially relevant to the Menindee system. A formal dialogue with stakeholder engagement should commence immediately.

Criteria One This criteria would need to be paramount.

Criteria Two Third party impacts can only be determined when a solid proposal is put.

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