

Reasonable Excuse Report – Barwon-Darling 2019-2020 Sustainable Diversion Limit Compliance Webinar Questions & Answers

Below is a summary of the Question & Answers raised in the public webinar held on Wednesday, 4 August 2021.

What is the history of how 523 GL was determined as the entitlement share volume in the DLWC Volumetric Conversion process?

The previous process in New South Wales (NSW), was based on area-based licensing and volumetric licenses. One of the methodologies used for inland, regulated systems was based on the crop area and crop type. 523 GL was the first number used to calculate the area-based licensing conversion in the Barwon Darling. Since implementing the cap accounting system and improvements in management and modelling in the Barwon Darling, this number has reduced significantly.

Is this being caused by carryover rules, IDELs or continuous accounting?

No, the current system involves an individual daily extraction component that limits the amount of water a user can extract in a day. The expectation is this system would push down the volume of take rather than increase the volume of take. In the Barwon Darling, there are periods of no flow or very low flows where there is no access to water. The account management rules allow users to access water above their entitlement volume after these no flow or low flow events. As we have developed the plan it has become clear that the new rules have created a long-term average that is equal to the cap volume.

What is the purpose of reasonable excuse if the MDBA does not accept them anyway? Whose incompetence is to blame for an administrative compliance error. Is the SDL compliance methodology flawed?

Response provided by MDBA

The Basin Plan introduces the concept of reasonable excuse. It was introduced because it is possible that consumptive take in a sustainable diversion limit (SDL) resource unit could be greater than the permitted take (or SDL compliance test), even though all the rules in the relevant water resource plan might have been complied with.

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The department claimed a reasonable excuse for the Barwon-Darling in part because the Commonwealth had not yet fully met its water recovery target there. The MDBA agreed with this claim for reasonable excuse, but it was not sufficient to explain the majority of the reported exceedance on its own.

The department also claimed a reasonable excuse for operation of the Barwon-Darling water resource plan. The MDBA did not agree with this claim, for the majority of the reported exceedance, because its view was that NSW had not operated in a manner fully consistent with its submitted water resource plan. In particular, it did not deliver on commitments under the bilateral agreement to assess and report compliance with its own use limit, which it submitted as part of the mechanisms it relies on to ensure that use will remain within the SDL.

Separately, the MDBA also agreed to two reasonable excuse claims from NSW where groundwater use was reported to exceed the limits.

The introduction of the SDLs and the reporting, testing and compliance arrangements - the SDL compliance methodology - has meant that the MDBA has been able to work with New South Wales and identify that there is a problem or an issue in the Barwon Darling.

The department has agreed to implement a number of actions to remedy the issues raised, particularly around modelling and the metering. So, the SDL compliance methodology is doing exactly what the Basin Plan intended.

Which model was used to assess compliance for the Barwon-Darling? Was this the most recent model? Did it take account of embargos / new rules for the valley? Is there an 'actual' problem with levels of take, or just a 'model' problem?

We are required by the Basin Plan to only undertake SDL compliance with the APT method (and model) that MDBA have authorised.

The submitted APT model includes all the new water sharing plan rules that were created as we developed the Water Resource Plan for Basin Plan purposes.

The APT model includes a version of embargo behaviour that is intended to provide additional supplies to Broken Hill, however this modelled behaviour is no longer relevant since the Broken Hill pipeline came online in early 2019.

Reviewing the underlying reasons for the difference between modelled take and actual take in 2019/20 highlighted that the Broken Hill embargoes were still included. Additionally, that while NSW still imposed restrictions on irrigator access using orders made under s324 of the NSW *Water Management Act 2000*, these were not included in the model.

Based on this new understanding, NSW has proposed to MDBA that Broken Hill embargoes should be removed from the next APT model, and that all states and valleys across the basin that have an ability to impose temporary water restrictions should in future include that in their relevant APT method. MDBA is considering this proposal for change.

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The other major component stems from the replacement of water meters. The model is calibrated to follow what the old meters tell us about diversions, but it seems that the newer meters are generally reading higher values for the same amount of pumping days on the same pumping equipment. We are still doing the technical work to understand the relationship between the old meters and the new meters, and when that work is complete the model will need to be recalibrated to suit the numbers from the new meters and the corrected values from the old meters.

How will you address the issue? Does this highlight the ICAC finding on favouritism to irrigation?

The NSW Government will follow the steps the MDBA has set out. The main determination includes replacing the outdated Broken Hill embargo model with a new approach that represents the effects of temporary restrictions made under s324 orders as well as applying the new Australian Standard compliant water meters records on water take.

Work is being undertaken to incorporate changes before the 2020/21 compliance check, however some amendments will be a part of a longer-term improvement program.

This SDL compliance outcome does not benefit irrigation interests in the Barwon-Darling.

What changes will be made to the Barwon-Darling model?

The department has submitted a 'make-good' plan to the MDBA on how it will rectify the non-compliance and acknowledges the modelling needs improving and is undertaking a project to recalibrate metres which will improve the accuracy of the data going into the modelling.

The department is committed to Sustainable Diversion Limit compliance and will continue to work with the MDBA on next steps.

The department's commitments to the MDBA in the make-good plan will not affect Barwon-Darling water user accounts or current practices in accordance with the water sharing plan. Actions in the make-good plan include improving the modelling (e.g., removing the historic embargo behaviour), improving metering calibration to better represent take, and assessing compliance with the long-term annual average extraction limit.

Can you confirm that the BD is cap compliant and is not continuing to rely on under cap use in the lower Darling to compensate for over cap use in the Barwon Darling?

Yes, the Barwon Darling cap is compliant.

The Barwon Darling cap is, I think 184, it was 173, why is this over cap?

The numbers rose following extensive analysis by NSW after the cap was introduced. However, as stated above, the Barwon Darling is cap compliant.

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Does this mean the conditions plan is wrong?

To the best of the department's knowledge, water users kept to the plan rules and their licence conditions. The anomaly is a technical issue that lies in the model.

The Broken Hill embargo provides significant benefit to Menindee and lower Darling and the towns upstream. Why should this be removed? In other words, why should the Broken Hill embargo be removed?

Broken Hill now has a pipeline to protect the supplies to Broken Hill. The department has proposed a new method (based on section 324 orders) if new behaviours emerge.

The department is working on a range of projects that are investigating connectivity and the management of water in the Barwon Darling.

Could you explain what an AWD is?

AWD is short for available water determination. A water allocation, which informs licensed water users how much water they can extract, is a type of announcement known as an available water determination (AWD). An AWD is given effect by a statutory water order. AWDs and their associated orders are issued on 1 July and periodically throughout the year.

For detailed information on the AWDs visit: [Available water determinations - Water in New South Wales \(nsw.gov.au\)](https://www.nsw.gov.au/available-water-determinations)

Is the 2021 water year for the Barwon Darling now non-compliant?

The department is committed to its make good plan submitted to the MDBA, to achieve compliance. Work underway appears to be showing that we will be compliant for the 2020/21 water year, but we need to complete the make good plan as directed by MDBA to have certainty.

Is there a penalty for non-compliance?

There is no fine related for non-compliance. Instead, the state is required to show how it will reduce the balance of the register to zero, as NSW has done.

There is a long history of MDBC and now known as the MDBA considering that the Barwon Darling valley has been over cap available in public documents. Can someone please speak to this history?

The department has spent several years analysing the data and ensuring that the Barwon Darling is cap compliant. Recent reports published by the MDBA, which includes the updated information which, shows that NSW is cap compliant.

Explain why growth in use in the Murrumbidgee Alluvium was reasonable.

The simple reason is that the state operated in accordance with the water - the draft water resource plan. So, there were some peculiar meteorological conditions of very dry and then quite wet, which made life difficult for the model, the APT model, against the real world of actual take, and so New South Wales was able to demonstrate that they were operating in accordance with the conditions of the water resource plan, followed the rules and so that was deemed to be a reasonable exceedance. It still needs to be brought back into balance, but it acknowledged the fact that the sophistication of the model wasn't dynamic enough for the conditions of the year from our perspective.

Historically the Broken Hill embargo measures protected flows through to Menindee. If you are going to update the model and remove the historical embargo measures does that mean the department has no intention of protecting flows through to Menindee and the lower Darling?

No, a current working example of our commitment to protect flows is the engagement work with the Menindee stakeholder advisory group about improving connectivity down the Barwon Darling.

What impact will the issuing of floodplain harvesting licences have on existing A, B and C class licence holders?

Work on floodplain harvesting licences is not complete. However, there should not be any effect on existing A, B, C licence class holders.

How could you ever have been able to justify merging Barwon Darling with lower Darling cap?

This decision was made shortly after the cap was applied in the Barwon Darling. Before any of the current staff were working at Department of Planning, Industry and Environment - Water. We understand that the decision was made due to uncertainty around what was occurring in the Barwon Darling at the time and the use of a new analytical model for the system. Subsequently, this concern was diminished as more accurate information was incorporated into the model. The decision to merge the Barwon Darling with the Lower Darling was not reversed. Also, it is assumed that at some stage cap accounting will cease as SDL accounting has now commenced.

Is the SDL number a number?

Sustainable Diversion Limits (SDLs) are like the MDB cap. They are not a fixed number in themselves, they are a definition that is turned into a number using modelling. The SDL is the average annual volume that can be extracted from a system over the 114-year period of record. Looking at the Barwon Darling the annual extraction varies considerably over the period due to climate.

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The Basin Plan and the Cap Schedule to the Murray Darling Basin agreement explicitly expect that modelling will be improved with new information and upgrades over time and that the numbers will change as a result.

MDBA must formally review and approve any changes that are proposed by the states.

Have you ignored the basic critical issue of connectivity response?

The NSW Government is committed to better understanding connectivity in the northern MBD. By better understanding the ecosystems we manage we can make science-based decisions and achieve the best outcomes for the community and for the environment. A stocktake has been undertaken of water sharing plan rules that may contribute to connectivity. For more information visit: [Water for the environment and river connectivity - Water in New South Wales \(nsw.gov.au\)](https://www.nsw.gov.au/water-for-the-environment-and-river-connectivity)

What proportion of meters in the Barwon Darling are compliant?

During the FY19/20 financial year, the Natural Resources Access Regulator (NRAR) paid attention to the Barwon Darling and west region of NSW. The regulator issued 5 fines, 5 legal directions to comply and 8 formal warnings to water users in the region. NRAR opened a total of 84 investigations during the year in this region and finalised 83.

Rates of compliance in the Barwon, Darling and west region of NSW are similar to other regions. Routine inspections conducted between October '20 and March '21 established a baseline compliance rate for the region of around 85 per cent, the highest in the state. As these were routine inspections sites which are part of active investigations were not visited as part of this program. For more information visit: <https://www.dpie.nsw.gov.au/nrar/how-to-comply/metering/compliance-state-of-play>

The 523 gigalitres for the Barwon Darling that was initially allocated as part of the DLWV volumetric conversion process in the early 2000s; was this value determined from satellite image analysis of water usage over the 1990s/early 2000s? How much bearing did this initial allocation of 523 gigalitres have on the granting of the unlimited carryover rules in the 2012 Barwon Darling water sharing plan? Are there any other unregulated water sharing plans (New South Wales, Queensland, Victoria, South Australia) that have unlimited carryover of unused entitlement?

The department has not conducted systematic inspection of how volumetric conversion took place, but we do not believe that satellite image analysis played a significant role.

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The relevant records are paper files. On a few occasions we have requested copies of the files to be provided to understand the history of a particular farms licencing changes over time and in those cases the volumetric conversion was based on measures of peak historical development including survey, direct inspection, and secondary data such as ginning records.

In practical terms, the valley scale compliance frameworks such as Cap & SDL are the real limits to extraction so there does not appear to be any value in attempting to re-prosecute volumetric conversion with modern remote sensing analysis techniques.

Is the reason the Groundwater SDLs were exceeded because carry over allows account balances can well exceed licensed volumes?

In the 2019/20 year, most of the growing season was very dry and hence groundwater usage was also high as we would expect. However, the period later in the water year was reasonably wet and increased the annual total rainfall levels to something more like an average year. Therefore, the annual permitted take method produced a correspondingly lower number in keeping with the full year of rainfall.

The SDL exceedance outcome is a function of the simple rainfall correlation method coming unstuck when it was applied to a year that transitioned from very dry to very wet after the growing season was largely over.

MDBA's acceptance of the reasonable excuse claim reflects our joint understanding that the outcome was a product of a simple APT method being applied to an unusual set of circumstances.

It is expected that as more years of data are added, this one-off event will become smoothed out and the SDL exceedance outcome will resolve itself, but NSW will also consider if we can revise the rainfall correlation technique to get a more robust methodology.

Any decision to change the method must be authorised by MDBA and will need to demonstrate that it forms a better estimate.

What is the floodplain harvesting figure in the Barwon Darling cap?

The Barwon-Darling Cap model run recently for plan limit compliance purposes estimates floodplain harvesting at 17,697 ML per year over the period 1/7/1895 to 30/06/2020.

Previously the Cap model has estimated 14,267 ML per year over the period 1/7/1895 to 30/06/2009 as published in the BDL report for the Barwon-Darling.

Can you please provide information on the APT model error/bias in the 2019-20 water year in the same way you would report on model error/bias if you were validating the model for that single year. It is important to know how well

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the model performed in terms of simulating observed river flows in that year to have confidence that the model also performed well in simulating permitted take.

We do not routinely inspect the model for flow bias, including for the 2019/20 year and there is no program envisaged either for NSW's own purposes, or as part of the Basin Plan compliance activity to undertake this work.

The SDL compliance framework requires that MDBA accredits an APT method (including modelled components) as being the best available when accepting a water resource plan. States are then mandated to use this method regardless of performance until MDBA agrees that a better model exists through WRP accreditation.

Can you please provide information on the following?

For the year 2019-20, what volume of water was simulated to occur and what volume was measured at gauges along the Barwon-Darling (and key gauges in other valleys)? What was the flow bias averaged over the year for each gauge? Were specific biases associated with low or high flows?

Alternatively, can you please provide the APT simulated flow data for key gauges (HIS/EWR gauges) in csv format for surface water and for each SDL resource unit?

It is not a correct methodology to assess model performance for SDL compliance purposes by looking at a single component of the model, all the other components such as representation of water sharing plan rules should also be considered.

Please see below a short analysis undertaken to compare modelled vs actual pumping access days at Bourke (the area of highest irrigation density)

- For A class, there was 87 days of actual access and 90 days of modelled access, a 3% overestimate.
- For B class, there was 72 days of actual access and 80 days of modelled access, an 11% overestimate
- For C class, there was 16 days of actual access and 19 days of modelled access, a 19% overestimate.

In each case, the extra days are at the end of the flow event so available volumes are limited.

- For A class 165 ML of additional take was possible.
- For B class 4198 ML of additional take was possible

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- For C class 4036 ML of additional take was possible

It is unclear if these volumes would have been taken as they occur at the end of the flow event, and we are aware that many active irrigators had either exhausted their available allocations or available on farm storage capacity by this point.

This analysis also assumes that NSW's recommendation to switch to actual s324 restrictions is agreed by MDBA and the analysis tries to address the performance of the underlying flow simulation components.

Which of the tributaries that feed the Barwon-Darling have rules about end of system flow? What are those rules, and why don't all tributaries have end of system flow rules?

All water sharing plans upstream of the Barwon-Darling have rules that facilitate connectivity, including flow targets, flow access conditions, extraction limits and rules for environmental water accounts. The Namoi WSP includes a flow target at Walgett that is delivered between June and August if there is sufficient storage in the Namoi system. Otherwise, there are no true end-of-system flow targets in these water sharing plans, but there are, for example, flow targets within the Barwon-Darling that need to be met before supplementary water announcements are made in the regulated NSW Border Rivers, Gwydir and Namoi water sharing plans.

Each tributary valley has a water sharing plan(s) that reflects a negotiated outcome between groups of stakeholders, including ones with an environmental focus. If a valley hasn't got an end of system flow rule, that simply reflects that environmentally aligned stakeholders prioritised their negotiation efforts onto other measures such as translucency rules, or shares of supplementary access events, or environmental water accounts.

As a practical matter, fixed end of system flow targets tends to be costly to service during dry years and they are not always the best way to expend a limited "budget" of environmental water.

If the NSW government was to simply impose an end of system flow requirement on each tributary valley without taking any other actions, we would expect to see material reductions in water allocated to entitlement holders which is likely to have additional consequences.

If the understanding around the optimum mix of environmental focussed measures has now changed, there will be future opportunities to revise Water Sharing Plans and a different balance of outcomes can be negotiated. There is no inherent bias within the Water Management Act 2000 either in favour or against end of system flow targets.

Will the proposed updates to the Barwon-Darling Annual Permitted Take model will have any consequences for the Floodplain Harvesting model?

The proposed changes to the Annual Permitted Take model (APT) will not have any immediate effects to the Barwon-Darling floodplain harvesting model.

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Will the fact that the new meters measure more water take than the old meters used in the Barwon-Darling model have any influence on the assessment of storage capacity in the FPH model?

No, the assessment of the storage capacity for those properties that utilise floodplain harvesting was undertaken as part of the Healthy Floodplains project.

The reasonable excuse report to the MDBA had an Annual Actual Take of 22,200 ML for FPH and an Annual Permitted Take of 29,228 ML. How were these volumes derived?

The APT figure of 29 GL comes from the APT model for the 2019/20 year and has been scaled up by the factor in the APT method report (about 3%). The scaling factor is used to increase the modelled APT figure up to the long-term SDL number, as in we believe this valley is generally taking less than the limits imposed by Cap and SDL.

The annual actual take figure is the long-term average modelled take from the BDL conditions model scenario which is the Cap model. The approved method that we worked out with MDBA was to estimate actual FPH take in any given year using the old Cap model in the absence of actual measured usage. The method is that in any year when FPH occurs, we assume it is the Cap era long term average.

This is the agreed method until the FPH licencing framework is in place.

How could you ever countenance 500% carryover?

The proposed account management rules for floodplain harvesting licences does not include a 500% carryover. Instead, it is proposed to have an account limit of 5 ML per unit share (or 500%) and any unused allocations can be carried over from one year to another, subject to the account limit. To reach the account limit of 5 ML per unit share, the licence holder must not take any water for 5 years. The intent of this proposed framework is to reflect the level of access for floodplain harvesting.

Floodplain harvesting can occur as infrequently as once every 7 years. As the entitlements must reflect a long-term average, the account management rules are intrinsically linked to entitlement size.

Under annual account (no carryover and an account limit of 1 ML per unit share), a large entitlement would be required to achieve the long-term average. Under this framework, licence holders would forfeit allocations most years due to the lack of flows on the floodplain. Conversely, under a 5-year accounting framework, the entitlement size is smaller. This allows for allocations to accrue during periods of no access and sufficient allocations to be available when there are flows on the floodplain.

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