Lower Lachlan Alluvium (GS25)

INITIAL SDL ASSESSMENT RESULT

The Authority is **confident** that the SDL continues to reflect an environmentally sustainable level of take and **proposes the SDL is maintained**.

The extent, nature of and planning for continued monitoring, evaluation and assessment by the New South Wales government for the management of local and site-specific areas of concern is critical to maintain environmental outcomes.

It is important that the impacts of a changing climate continue to be actively considered for this SDL Resource Unit.

Figure 1: Lower Lachlan Alluvium (GS25) SDL Resource Unit

The Authority is assessing whether the Sustainable Diversion Limit (SDL) for the Lower Lachlan Alluvium SDL Resource Unit (the **Unit**) continues to support environmental outcomes and reflect an environmentally sustainable level of take (ESLT).

This Assessment Summary provides an overview of the factors which are relevant to that work and the Authority's initial view. The summary draws on three 'Lines of Enquiry', engaging with the likelihood that environmental characteristics are met, the Authority's confidence in that assessment, and the consequence of an at risk finding. Line of Enquiry 1 – current Basin Plan implementation – has been considered as the primary line of evidence.

Information on the Lines of Enquiry and methodology used in this assessment is available in the *Summary of Assessment Approach* and the *SDL Assessment and Response Framework*. Information on the *Basin Plan Review Discussion Paper* and process for making a submission are available on the MDBA website.

About this Unit (as at June 2024)

Aquifer Storage/size (GL)	353,905
SDL as at June 2025 (GL/y)	117
Entitlement volume (GL)	109
Average annual take (2012/13–2022/23, GL/y)	100
Significant surface connections	Not applicable

The Water Resource Plan (WRP) that supports this Unit commenced on 22 August 2023. The WRP includes the rules and arrangements that NSW are using to manage this Unit and maintain sustainability.

Utilisation at the time of the review

The pattern of use in this Unit varies. Given the SDL is a long-term average, the Authority expects variability every year depending on the climate, water availability, licence conditions, and individual water user decisions.

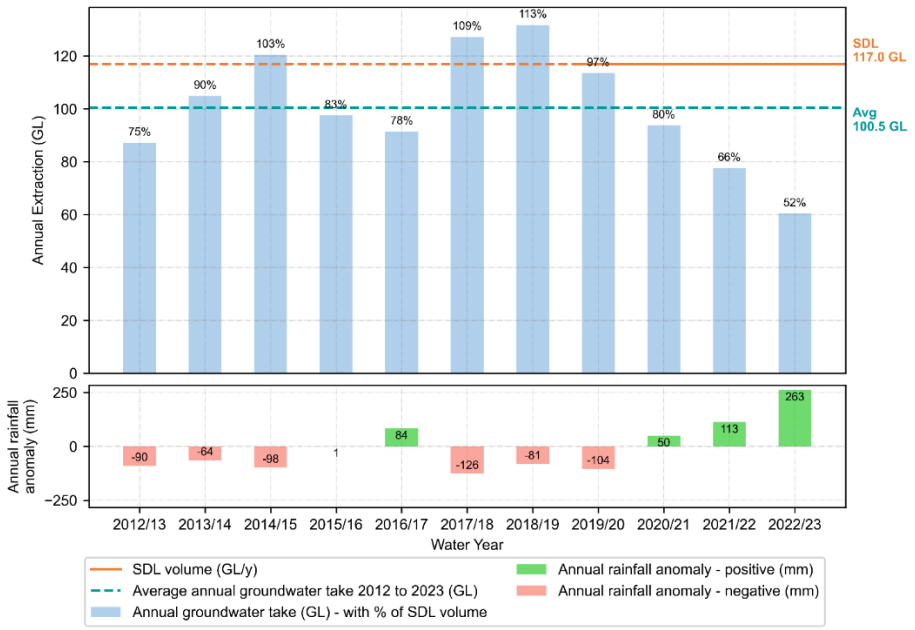

Figure 2: Utilisation for the period 2012/13 to 2022/23

In this Unit, the initial assessment noted localised areas of environmental risk, including to GDEs and productive base around the area of Hillston. These issues are at a small and/or local scale and do not impact environmental outcomes at the Unit scale. However, the Authority notes the risks and encourages the NSW government to consider these localised issues and the adequacy of their own water management rules and arrangements.

Environmental outcomes at the time of the Review

Likelihood and confidence

Table 1 presents a compilation of the groundwater level and salinisation trend for this Unit, and the Authority's *confidence* in that assessment (i.e. low (L), medium (M) or high (H) surety of the finding).

Assessment characteristic	Short term (Past 12 years)			Long term (Past 40 years)		
	Rising/Stable	Declining	Confidence	Rising/Stable	Declining	Confidence
Groundwater Dependent Ecosystems (GDEs)	15%	2%	●●○	0%	18%	●●○
Surface water – groundwater connectivity	25%	29%	●●○	6%	48%	●●○
Productive base	14%	32%	●●○	6%	41%	●●○
Water quality	0%	0%	●○○	10%	4%	●○○

Table 1: Groundwater level and salinisation trend assessment over the last 12 and past 40 years. A declining percentage of 30% or greater indicates a risk to groundwater levels supporting the relevant assessment characteristic. Regarding confidence, a single dot indicates low confidence in the trend data, two dots indicate moderate confidence, and three dots indicate high confidence.

As can be seen, two of the groundwater characteristics have been identified as have declining trends of 30% or greater over the long term. Confidence in the assessment is medium. Further consideration of the underlying data behind this result reveals that over the short term, the Lower Lachlan Alluvium shows medium rates of decline at a localised scale affecting productive base.

Noting there is limited monitoring data on changes in groundwater salinity, the assessment does not indicate risk to water quality.

Other lines of evidence

NSW have advised that the groundwater levels in the Lower Lachlan Alluvium have stabilised over the past few years and are likely reaching a new level of equilibrium. NSW changed management in this unit in response to past declines and are continuing to monitor levels.

Tables 2 and 3 below provide a summary of recharge information, and an assessment of the likelihood of full utilisation of the SDL. This information is relevant because it informs an assessment of recharge relative to take (current and by reference to the SDL) and how sensitive the Unit is to change in recharge (i.e. variability in conditions year to year) and increases in actual take.

In considering Table 2 below, note that:

- The 'proportions' can also be interpreted as a percentage. For example, a proportion of 1.29 indicates that the SDL is 129% of (or, 29% above) the recharge rate.
- If the SDL as a proportion of recharge is 1:1 they are equal, and if it is more than 0.9, risk is indicated because take is approaching the level of recharge.
- 'Buffering' relates how big total aquifer storage is compared to recharge. An aquifer with a very large total storage will offer high buffering because it will take a long time for changes in recharge to affect overall groundwater levels. In that scenario, the aquifer is described as having 'low' sensitivity to changes in recharge. The reverse applies where total aquifer storage is relatively small. In that case it would have 'high' sensitivity to changes in recharge.

Recharge information					
Status of recharge knowledge base (modelled)	Proportion of SDL to recharge (modelled)	Proportion of aquifer storage to recharge estimate			Proportion of average annual take to recharge (modelled)
		Modelled	Buffering	Sensitivity	
Best available	0.98 Risk indicated	2,949	High	Low	0.84

Table 2: Modelled recharge estimates as a proportion of the SDL, total aquifer storage and average annual actual take.

Potential *likelihood* of full utilisation of the SDL						
Very unlikely	Unlikely	About as likely as not	More likely than not	Likely	Very likely	% Average annual take
				●		86

Table 3: Likelihood of take increasing to the SDL

Tables 2 and 3 reflect that SDL is almost equal to the modelled recharge, and that total aquifer storage provides a high degree of buffering against and low sensitivity to changes in re-charge. The assessment also shows that current average annual take is more than half of the SDL and that full utilisation up to the SDL is *likely*.

Environmental outcomes under a fully utilised SDL and climate impacted future

Full use of the SDL

It is important that the work of the review is conducted against the backdrop of a fully utilised SDL, reflecting that it is the SDL that must reflect an ESLT. As summarised in Tables 2 and 3, the initial assessment has considered a scenario where take increases and use reaches up to the SDL. This analysis considered new information about modelled recharge as a proportion of the SDL, our knowledge of total aquifer storage and average annual actual take.

Climate change through to the 2036 Basin Plan Review and 2050

Table 4 presents a summary of the anticipated environmental impacts of climate change for the Unit by reference to the future recharge estimates.

SY2 climate scenario	Trend towards 2036		SY2 climate scenario	Trend towards 2050	
	Recharge greater than SDL **Low Risk**	Recharge less than SDL **High Risk**		Recharge greater than SDL **Low Risk**	Recharge less than SDL **High Risk**
Warmer and slightly wetter	●		Hotter and slightly wetter	●	
Warmer and drier		●	Hotter and drier		●
Warmer and much drier		●	Hotter and much drier		●

Table 4: Risk to assessment characteristics at full use of SDL using estimates of future recharge under future climate

Noting the low degree of certainty associated with the climate scenarios, this analysis showed potential risk to groundwater levels across four of the six climate scenarios as recharge is less than the SDL.

Initial Assessment

As noted, the assessment reflects mediums rates of localised decline in groundwater levels that present a risk to groundwater characteristics under current levels of take. The assessment also shows that average take is already close to the SDL and likely to increase up to the SDL. Further, the assessment notes modelled recharge is currently slightly more than the SDL but is likely to decrease below the SDL under four of six climate scenarios.

The assessment has considered the risks to groundwater characteristics and the management settings currently in place and planned by the NSW government. While this Unit is displaying at risk assessment characteristics, the risks are localised and could be addressed through application of existing state management tools.

On the balance of all three Lines of Enquiry the Authority is **confident** that the SDL reflects an environmentally sustainable level of take at the resource unit scale and is supporting the Basin Plan's environmental outcomes under full implementation conditions.

It is recognised that ongoing monitoring, evaluation and assessment will be important, as will planning for and supporting maintenance of groundwater levels and quality.

Consideration of Response

The assessment considers that the localised risk to assessment characteristics that have been identified are best managed through application of management settings currently available to NSW under the accredited WRP. The assessment also notes that NSW has developed the *NSW Groundwater Strategy 2022* and is developing a NSW groundwater level decline operational protocol that will enable more targeted management actions to be applied to address localised impacts.

It is recognised that ongoing monitoring, evaluation and assessment will be important to maintain environmental outcomes. The Discussion Paper engages with well-known challenges at a sub-Basin and Basin scale including river connectivity, salinity and groundwater re-charge.

Evidence summary

In addition to the standard evidence sources in the *Summary of Assessment Approach* available on the MDBA website, the following specific evidence sources were used to assess this unit:

- NSW Department of Climate Change, Energy, the Environment and Water (2024) Lower Namoi Groundwater Source Groundwater annual report 2024, Lower Lachlan Groundwater Source PUB25-93
- NSW Department of Planning and Environment (2021) 2021 review of groundwater levels in alluvial groundwater sources of inland NSW. PUB22/15
- Crosbie R, Wang B, Kim S, Mateo C, and J Vaze, (2023), Changes in the surface water – Groundwater interactions of the Murray-Darling basin (Australia) over the past half a century. *Journal of Hydrology*, 622, doi:10.1016/j.jhydrol.2023.129683