

LTAEL compliance assessment for Gwydir Regulated River Water Source

Executive Summary

This report describes the methods used to assess if extractions in the Gwydir Regulated River Water Source are compliant with the limit described in the water sharing plan in the 2022-23 water year. The assessment found that long-term average annual extractions were compliant in 2022-23 due to the commencement of floodplain harvesting licences that year. The licences became fully operational on the 15th of August 2022 after the Gwydir Regulated River Water Sharing Plan was amended on the 29th of July 2022, to include rules for floodplain harvesting.

Background and Purpose

The water sharing plan for the Gwydir Regulated River Water Source requires an assessment of compliance with a Long-term Average Annual Extraction Limit (LTAEL). The LTAEL is sometimes referred to as the 'plan limit'.

The assessment is to be carried out annually by the Department¹ on behalf of the Minister following the end of each water year. LTAEL compliance requires two scenario models; one to represent the LTAEL and one to represent current conditions. The long-term results from both scenario models are compared to assess compliance.

Each water sharing plan defines the LTAEL, how the compliance assessment is to be completed, triggers for non-compliance and subsequent compliance action. The LTAEL includes multiple types of water use. However, the compliance assessment is based on the total.

This report summarises a compliance assessment for the Gwydir Regulated River Water Source for the 2022-23 water year. The assessment was based on best available models, using updated² climate data from 1895 to 2023.

Scenarios and agreed model version

Model scenarios for Cap, water sharing plan and current conditions were selected based on evaluation against multiple [scenario model selection criteria](#), including whether these had been documented and independently reviewed, how appropriate the management and levels of development are, and the consistency of the hydrology. For the Gwydir Regulated River Water Source, the selected model scenarios reported in Table 1 are the most appropriate for the 2022-23 LTAEL compliance purposes.

The scenarios are based on the floodplain harvesting scenario models which have been documented and published on [our website](#). There are two reports. The [model build report](#) describes the development of the river system model – its conceptualisation, construction and calibration. The [scenario report](#) describes how the model

¹ Refers to the current Department of Climate Change, Energy, the Environment and Water (DCCEEW), as well as its predecessor(s) and likely successor(s) over the life cycle of each WSP).

² Contrary to previous years, all climate data has been refreshed for the entire long term compliance assessment period.

was used to assess the LTAEL and current conditions as well as other scenarios required for the floodplain harvesting program. It should be noted that the Gwydir Regulated River Water Sharing Plan was amended on the 29th of July 2022 to include rules for floodplain harvesting. The floodplain harvesting licences have been fully operational since the 15th of August 2022; therefore, as of 2022-23, they are an integral component of the current conditions.

Table 1 Scenario models selected for Gwydir Regulated River Water Source for LTAEL assessment purposes

Scenario model	System file
Cap conditions	CAP_v27_11_2023.sqq
WSP conditions	BDL_v27_11_2023.sqq
Current conditions	VSC_v27_11_2023.sqq

Note: models above are the same as used in 2021/22 but run using updated in 2023 inputs¹.

LTAEL compliance results

LTAEL assessment

The LTAEL is the modelled long-term average annual extractions calculated over the duration of the available climate record using either the Cap or the Water Sharing Plan scenario model, whichever is the lesser. For this assessment, the modelling period 1895-2023 is used. The results of this analysis are reported in **Error! Reference source not found.**

The LTAEL for Gwydir Regulated River Water Source is 399.7 GL/y based on the water sharing plan scenario model. There are also unmodelled extractions estimated at 6.0 GL/y. These unmodelled estimates have not changed and are not included in LTAEL compliance assessment.

Table 2 Modelled long term average annual extractions (1895-2023) for Cap and WSP scenario models (GL/y)

Extraction category	Cap scenario model	Water Sharing Plan scenario model
General and high security	211.2	207.3
Supplementary access	109.6	88.2
Local Water Utility	3.8	3.8
Floodplain harvesting	81.9	100.4
Total modelled extractions	406.5	399.7
Unmodelled estimates		
Basic Rights	6.0	6.0

This water sharing plan now includes all water take components such as plantation forestry and harvestable right dams, to harmonise with reporting required under the Basin Plan. In this regulated river water sharing plan area, the water source boundary is defined by the bank of the regulated river and hence plantation forestry and harvestable rights dams are located within the adjacent unregulated river water source.

Water taken under a basic landholder right has also been excluded from the compliance assessment. This exclusion is due to any unmodelled estimates being omitted if no assessment of change has been made.

Finally, rainfall runoff exempt under the Water Management (General) Regulation 2018 (Clause 39B) has also been excluded from the compliance assessment. The exempt rainfall runoff volume is excluded from the definition of floodplain harvesting and from the definition of LTAEL with the amended Water Sharing Plan.

Compliance assessment

Compared to the LTAEL model scenario, the modelled long-term average annual extractions from the current conditions model scenario are reported in Table 3.

Table 3 Modelled long term average annual extractions (1895-2023) for LTAEL and Current Conditions' scenario models (GL/y)

Extraction category	LTAEL scenario model	Current conditions scenario model
General and high security	207.3	213.3
Supplementary access	88.2	89.7
Local Water Utility	3.8	3.8
Floodplain harvesting ²	100.4	94.2
Total modelled extractions	399.7	401.0

The key reason for differences between LTAEL and current scenario model results is a 2.5% growth in regulated river extraction due to floodplain harvesting rules. Despite larger current on-farm development (e.g., pumping and storage capacity), the accounting framework reduces floodplain harvesting extractions by around 6.2%, posing higher demand on other water sources but limited by overall water availability (Allowable Water Determinations (AWD) and Supplementary flow).

The current water sharing plan specifies that there is non-compliance where:

- Current condition extractions exceed LTAEL by 3% or more; or
- Current condition extractions exceed the average of CAP and LTAEL; or
- Current condition extractions exceed the Cap

The results show compliance as the criteria for non-compliance are not met. Specifically, the results show that current conditions extractions are:

- Larger than LTAEL extractions by 0.3%
- Smaller than average of CAP and LTAEL by 0.5%
- Smaller than CAP by 1.3%

In addition, the assessment does not include temporary water restrictions which were in place in 2022-23. In that year, there was a reduction to the Supplementary Access entitlement Available Water Determination (AWD). This reduction was an LTAEL compliance action. This new assessment is checking whether there is a return to compliance without the need for temporary water restrictions.

Compliance actions

The NSW Government took compliance action in the 2021-22 water year by reducing the Available Water Determinations (AWDs) for Supplementary Access entitlements in the Gwydir Regulated River Water Source to 0.5 ML/share to begin returning extractions to LTAEL. A further compliance action of 0.21 ML/share was taken at the commencement of the 2022-23 water year as the rules in the Water Sharing Plan for floodplain harvesting licensing had not commenced.

However, floodplain harvesting licenses have been fully operational in the Gwydir Regulated River Water Source since the 15th of August 2022. The rules for floodplain harvesting licenses are defined in amendments made to the Gwydir Regulated River Water Sharing Plan on the 29th of July 2022.

Following last year's assessment, there was a firm anticipation that the licenses would effectively restrict water taken through floodplain harvesting and bring extractions back to LTAEL. This anticipation enabled the lifting of the July 2022 compliance action, and on the day the licenses were enabled, the available water determination for Supplementary Access entitlements was restored to 1.0 ML/share.

This year's assessment results confirmed these expectations, demonstrating the Gwydir Regulated River Water Source's return to compliance with LTAEL.

No further compliance action is required.

Supporting information

Results over Basin Plan assessment period

This year, we updated all climate data inputs throughout the entire long-term model simulation period. The fully updated climate data adhere to the principle of utilising the best available information. This led to occasional significant changes in evaporation data, particularly for Copeton Dam, and the flows, which were extended through Sacramento modelling. While long-term averages remained largely unaffected (except for Copeton Dam's evaporation), we observed significantly different annual variability. Not surprisingly, this distinction is especially noticeable in the first half of the historical period, i.e., prior to 1970. Consequently, this accounts for a somewhat different estimate than previously for the long-term level of modelled extraction, including CAP and LTAEL. However, it plays no material role in returning the Gwydir Regulated River Water Source to compliance.

The updated results over the Basin Plan assessment period of 1895-2009 are presented in Table 4 and included for reference only. These results will be used to track significance of future model updates.

Table 4 Modelled long term average annual extractions (1895-2009) for LTAEL scenario model and Current with floodplain harvesting licences scenario model (GL/y)

Extraction category	LTAEL scenario model	Current conditions model
General and high security	211.7	218.4
Supplementary access	89.3	90.8
Local Water Utility	3.8	3.8
Floodplain harvesting	101.0	92.2
Total modelled extractions	405.8	405.2