Section 71, Matter 9.1 & 9.2, and Cap Reporting for 2021-22

Water resource management overview for the State

Queensland's water resource plans control the management of groundwater, overland flows and water in watercourses, lakes and springs within all catchments in the Queensland section of the Murray-Darling Basin (QMDB). Water resource plans for the Condamine-Balonne and Border Rivers-Moonie water resource plan areas were finalised in February 2019 and accredited under the *Water Act 2007* (Cwlth) in September 2019.

The Water Resource Plan for the Warrego-Paroo-Nebine water resource plan area was finalised in 2016 and accredited under the *Water Act 2007* (Cwlth) in June 2017.

Surface water

Surface water in the QMDB is divided into three water resource plan areas: Warrego-Paroo-Nebine, Condamine-Balonne and Queensland Border Rivers-Moonie, which are further divided into six separate sustainable diversion limit (SDL) resource units: Warrego, Paroo, Nebine, Condamine-Balonne, Queensland Border Rivers, and Moonie. The Basin Plan requires local reductions through water recovery in the Queensland Border Rivers, Condamine-Balonne, Warrego and Nebine SDL resource units. These local reductions have been achieved in the Queensland Border Rivers (14 GL), Warrego (8 GL) and Nebine (1 GL) catchments. Eighty six percent of the in-catchment reduction of 100 GL has been achieved in the Condamine-Balonne SDL resource unit with 14 GL still to be recovered by the Commonwealth.

Groundwater

For aquifers in the QMDB, groundwater managed under the Basin Plan includes water in formations above and below the below the Great Artesian Basin (GAB). Note that water in aquifers in the GAB is managed under the Water Plan (Great Artesian Basin and Other Regional Aquifers) 2017.

Groundwater under the Basin Plan is divided into 16 SDL resource units based on groundwater aquifers that underlie various surface water catchments across the Condamine and Balonne, Border Rivers, Moonie, Warrego, Paroo and Nebine catchments.

The take of water from an aquifer for stock or domestic purposes by the owner of the land overlying the aquifer is managed under the *Water Act 2000* (Qld). Access for these purposes has previously been limited under the Act (by moratorium) in the Upper Condamine Basalts and the Upper Condamine Alluvium (both Central Condamine and Tributaries) to restrict growth of groundwater use in urban areas serviced by reticulated supplies. These provisions have been incorporated into the water plans for the Condamine and Balonne, Border Rivers and Moonie catchments and help ensure a 'no-growth' position in the higher risk area of peri-urban expansion.

Management of all Queensland's groundwater systems in the MDB has been accredited as meeting the Basin Plan SDLs. There are two major groundwater systems (Central Condamine Alluvium and the Condamine Tributary Alluviums) where the SDL is below the

baseline diversion limit (BDL), and these were eligible for water to be recovered through buyback of entitlements.

This buyback has been completed in the Central Condamine Alluvium following the implementation of an incentivised approach developed by a collaborative effort between the Commonwealth and irrigator stakeholder groups (recovering 35 GL). This has resulted in the Central Condamine Alluvium being reduced to close to SDL, with only a few licensees having their nominal entitlement reduced without compensation. While the current level of entitlement in this SDL resource unit is still above SDL, the Water Plan (Condamine and Balonne) 2019 has provisions to manage the volume of water taken within a water year, as well as limiting the long-term take to SDL (over a 10-year accounting period). The buyback in the Condamine Tributary Alluviums has commenced but remains incomplete at this time with a further 3 GL to be recovered.

The other key Queensland groundwater system where SDL is less than BDL is the Border Rivers Alluvium. While the BDL and SDL are similar in the Border Rivers Alluvium, entitlement levels are higher, particularly in the Border Rivers Alluvium (Deep) underground water sub-unit. This has required the development of specific management rules in this area to enable adherence to SDL over the long-term (measured over 10 years). Entitlement levels in all other Queensland SDL resource units are either at or below SDL.

Section 71 reporting and SDL compliance

This section presents a summary of the key section 71 clauses of the *Water Act 2007* for surface water resource plan areas (and SDL resource units where appropriate).

- Available water *(the quantity of water available from the water resources of the water resource plan area during that water accounting period)*

Rain associated with the on-going La Niña event triggered flows throughout the water year, most notably in the eastern catchments of the QMDB. Flows at the majority of QMDB monitoring sites were in the top three wettest seasons on record, with the Border Rivers and Condamine and Balonne having multiple flood events throughout the year. The Border Rivers had the benefit of a flow in July 2021 from northern NSW catchments, while the Queensland catchments received good flow events in November and December 2021, and March, April and May 2022. Due to the saturation of catchments, floods triggered at typically smaller rain events and/or lasted for longer durations, with none of the long-term sites recording new flood heights.

In contrast, the more western catchments of Maranoa and Warrego were dryer, and flow events were more restricted to the summer months of November 2021 to March 2022. Table 1 shows the recorded volume of flow at key sites across the region.

Table 1: Recorded flow at key sites in the QMDB

River and gauging station location	Average annual flow (GL)[1]	Total annual flow past gauging station 2021/2022 (GL)	Percentage of average
Condamine and Balonne catchment			
Condamine River @ Chinchilla	568	3028	533
Condamine River @ Cotswold	737	4003	543
Balonne River @ Weribone	1230	4620	376
Maranoa River @ Cashmere	159	223	141
Balonne River @ St George	1215	4466	367
Border Rivers catchment			
Macintyre River @ Goondiwindi	965	3928	407
Weir River @ Talwood	153	682	445
Barwon River @ Mungindi	516	2420	469
Moonie catchment			
Moonie River @ Fenton	157	557	354
Warrego catchment			
Warrego River @ Cunnamulla	449	216	48
Paroo catchment			
Paroo River @ Caiwarro	499	335	67
Nebine catchment			
Nebine Creek @ Roseleigh Crossing	28	70	248

The Condamine River has had flows for almost the entire water year, with remnant flows from the previous year being topped up by a series of minor events in July 2021, which maintained good base flows until the commencement of the wet season in November.

Water held in major dams at the start of the water year in the upper and middle Condamine catchment was 29% of capacity in Leslie Dam in the upper catchment and 73% in Chinchilla Weir. Both storages benefitted from the relatively small flows in July 2021, with Leslie Dam reaching 56% capacity and Chinchilla Weir reaching 100% capacity. Chinchilla Weir was drawn down to 85% capacity by early November before the on-going inflows re-filled the weir and maintained capacity at over 100%. Similarly, inflows to Leslie Dam in November increased its capacity to 100%, which was maintained to the end of the water year.

The inputs to Chinchilla Weir in 2021/22 included 2.5 GL of treated coal seam gas (CSG) water discharged into the weir under an approval of a resource for beneficial use. As per licence requirements, the entire volume of treated CSG water was taken within the limits of

[1] Average annual flow is the average for the period of record for that gauging station. It varies from 15 years of record at Roseleigh Crossing to 81 years at Goondiwindi. The numbers are indicative only.

the Chinchilla Weir Water Supply Scheme. The diversion of treated CSG water is not accounted for under section 71 as this water is sourced from the Great Artesian Basin, not from water resources of the Murray-Darling Basin.

Flows in the Balonne River upstream of Beardmore Dam in 2021/22 were the second highest on record (the highest being in 2010/11). Beardmore Dam started the water year at 86% capacity but increased to 97% following inflows in late July 2021. The storage volume declined to a low of 61% in early November, increased to 100% mid-November, then dropped to 86% mid-February but refilled, finishing the year at 100% capacity.

Announcements for waterharvesting in the Lower Balonne commenced on 15 November 2021 with the first event lasting until 3 January 2022. This was followed by a further six flow events of varying lengths, with the final announcement period for the year ending on 23 June 2022.

Flows generally attenuated downstream of St George to be about three to four times the sites' long-term average annual volumes. The exception to this was Briarie Creek, which has a small catchment closer to the border and had additional local run off to make this the second wettest year after the major flooding of the 2010/11 season.

The major flood peak of about 10.4 m at Goondiwindi Town gauge in early December 2021 was the equal fifth highest on record. There were events over 7 m gauge height in July, August, and November 2021 and March and May 2022. These, along with many low freshes, made it the wettest season since 1950/51. The volume passing Goondiwindi in 2021/22 was about four times the mean annual volume. This compares with nearly eight times the mean annual volume at the most upstream site of Broadwater Creek in the Stanthorpe Water Management Area, which attenuated to about six times the mean annual flow at Farnbro, showing the high levels of runoff from the Border Ranges, the result of receiving the highest annual rainfall on record. The frequency of high flows resulted in about six times the mean annual volume flowing through the distributaries associated with the Callandoon Creek breakout, downstream of Goondiwindi. All sites attained first or second largest annual volume on record, except the minor catchments of Brush Creek and Oaky Creek, which attained third ranking.

The older sites of Talwood and Gunn Bridge on the Weir River had their second largest annual volume on record, with multiple flood flows in July and December 2021, and March and May 2022. The other months, except for September, also had several small flow events making the annual volume passing these gauging stations about four times the long-term average. The newer sites at Jericho, Mascot and Gooray Road recorded the largest annual volumes on record, including the largest peak height on record in the December 2021 event.

Glenlyon Dam in the upper Border Rivers catchment started the year at 56% capacity. Inflows in early July 2021 increased the volume held to 71% capacity, with additional inflows in November filling the dam and maintaining it at full supply level to the end of the water year. Coolmunda Dam on the Macintyre Brook started the year at 100% capacity, with inflows maintaining the water level at 100% capacity until the end of the water year.

The Moonie catchment had about three times the long-term average runoff. Fenton, the most downstream gauge on the Moonie River in Queensland, had the fourth largest flow on record.

In contrast, the Warrego catchment had only average or above average rainfall in the 2021/22 water year. Flows commenced about November 2021 with the major flow event in early December, but the lack of the persistent large events that occurred further east made for an average type of year.

The Nebine catchment received above average rainfall in the 2021/22 water year, with more than twice the average flow volume passing the Roseleigh Crossing gauging station at the bottom of the catchment.

Like the Warrego, the Paroo catchment had only about average rainfall. The gauge on the Paroo River at Caiwarro recorded 67% of its annual average.

- Permitted take *(the quantity of water permitted to be taken from the water resources of the water resource plan area during the water accounting period)*

Water from the Queensland Border Rivers SDL resource unit is permitted to be taken through approved works (equipped with a working meter) in the state of New South Wales under an agreement between Queensland and New South Wales. Note there is no transfer of an approved volume of water from a Queensland water account to a New South Wales water account. Reciprocal arrangements apply to water taken from the New South Wales Border Rivers SDL resource unit through works in the state of Queensland. Annual permitted take is adjusted for this use.

The take of water from watercourses under an entitlement[2] and from overland flow by floodplain harvesting

Take of water from watercourses is managed through limits stated on entitlements and by water sharing rules in water management protocols (which implement the provisions of Queensland's water plans). The take of overland flow water (including floodplain harvesting) is managed through a combination of regulation of works and limits on entitlements.

Annual permitted take from watercourses under an entitlement, including permitted take under entitlements held by the Commonwealth Environmental Water Holder (CEWH), is determined using a hydrological model[3]. The permitted take by the CEWH is then subtracted from the total. The volume of annual permitted take by floodplain harvesting in areas other than the Lower Balonne is not able to be modelled with confidence and so is based on estimated take. For the Lower Balonne Floodplain, annual permitted take by floodplain harvesting is estimated by the hydrological model.

The flow event management rule for managing flows to support Narran Lakes (under section 170 of the Condamine and Balonne Water Management Protocol) was activated in the Lower Balonne in March, April and May 2022. Application of the flow event management

[2] Entitlement is used in this document as a generic term referring to water access entitlements (called water allocations in Queensland and not attached to land) and water licences (authorities to take water which are attached to land).

[3] For the Condamine-Balonne and Queensland Border Rivers-Moonie water resource plan areas this is the relevant eWater Source computer program reviewed by the Authority as part of the preparation of the water resource plans. For the Warrego-Paroo-Nebine water resource plan area it is the relevant IQQM computer program reviewed by the Authority as part of the preparation of the water resource plan.

rule triggered a total period of 30 days of 10% reductions to the maximum rate of take for waterharvesting entitlements. The annual permitted take has been reduced accordingly.

The take of water from watercourses under basic rights

The take of water from a watercourse, lake or spring for basic rights (stock or domestic purposes) by the owner of the land adjoining the water source is permitted under the *Water Act 2000* (Qld). Potential increase in take is limited due to the right to take water being limited to properties with riparian access to water. The annual permitted take of water from a watercourse for basic rights is estimated using the methods outlined in the Water Accounting Methods Reports for the Condamine-Balonne, Queensland Border Rivers-Moonie and Warrego-Paroo-Nebine water resource plans.

The take of water by runoff dams (including take under basic rights)

The take of overland flow water for basic rights by an owner of the land on which the water collects is permitted (within limits) under the Queensland regulatory framework. Any increase in take for basic rights will be related to rural population growth and/or an increase in stock numbers.

Under water plan provisions, no increase in overland flow take is permitted for uses other than basic rights, except for certain limited cases, such as when capture of contaminated overland flow water is necessary to satisfy the requirements of an environmental authority.

The annual permitted take of water by runoff dams in the Condamine-Balonne and Queensland Border Rivers-Moonie water resource plan areas is the long-term annual average limit estimated by the Murray–Darling Basin Authority (the Authority), which is listed in Schedule 3 of the Basin Plan and identified in the relevant water accounting methods reports. The annual permitted take of water by runoff dams in the Warrego, Paroo and Nebine catchments is estimated using the method outlined in the Water Accounting Methods Report for the Warrego-Paroo-Nebine Water Resource Plan.

The take of water by commercial plantations

In Queensland, the take of water by commercial plantations is not a significant issue and to date has not necessitated active regulation under the *Water Act 2000* (Qld). There are few commercial plantations in the QMDB.

The annual permitted take of water by commercial plantations is the long-term annual average net take estimated by the Authority, which is listed in Schedule 3 of the Basin Plan and identified in the relevant water accounting methods reports.

- Water allocations *(details of the water allocations made in relation to the water resources of that area in relation to that water accounting period)*

Under the *Water Act 2007* and for the purposes of the Basin Plan, water allocation[4] means the specific volume of water allocated to water access entitlements in a given water accounting period.

[4] In Queensland, a *water allocation* refers to a water access entitlement (which is defined by the Commonwealth Water Act as 'a perpetual or ongoing entitlement, by or under a law of a State, to exclusive

For surface water in Queensland, water allocations apply only to supplemented water (water provided through water supply schemes) managed under a mixture of *announced allocation* and *continuous sharing*.

Announced allocations

Water access entitlements in the Upper Condamine and Chinchilla Weir water supply schemes in the Condamine-Balonne water resource plan area are managed under an annual announced allocation system. At the start of the water year, water in the scheme's storage/s is first set aside for 24 months' supply for high priority users (mainly town water supply and associated water losses during storage and distribution). The medium priority entitlement holders are then granted the remaining water as a percentage of their water access entitlement, taking into account losses associated with storage and distribution for the remainder of the water year. Medium priority entitlement holders in the Upper Condamine and Chinchilla Weir water supply schemes may also be granted access to natural flows in the river downstream of the storage in accordance with the 'stream flow period' rules for the scheme.

The announced allocation is recalculated each month but only reset if the announced allocation would increase by 5 or more percentage points. The usage in a water year may be no greater than 100% of the entitlement.

Water access entitlements in the Cunnamulla Water Supply Scheme in the Warrego catchment are also managed under an annual announced allocation system. There is no high priority water in the Cunnamulla Water Supply Scheme; otherwise, announced allocations are made in a similar way to those in the Upper Condamine and Chinchilla Weir water supply schemes.

Continuous share schemes

The St George Water Supply Scheme in the Condamine-Balonne water resource plan area and the Macintyre Brook Water Supply Scheme in the Queensland Border Rivers-Moonie water resource plan area provide management options which include both announced allocation and continuous share. Most of the entitlements in the scheme are managed under continuous share arrangements. All medium priority entitlements in the Border Rivers Water Supply Scheme are managed under continuous accounting rules.

In a continuous sharing system, water users have storage accounts, which are proportional to their share of the total entitlement in the scheme. The storage account increases when distributions are made (i.e., when there is inflow into the water storage) and decreases with water use, evaporation and seepage losses (except in the Border Rivers Water Supply Scheme where evaporation and seepage losses are managed as a separate account).

In any water year, the volume available under an entitlement managed as an individual continuous share is the volume in the storage account at the start of the water year plus any water distributed to the account under the rules in the relevant operations manual following an inflow into the scheme, capped at 100% of the nominal volume of the water access

access to a share of the water resources of a water resource plan area'). Basin Plan terminology is used in this report.

entitlement. Additional carry over or forward draw of entitlement may be made available in the St George Water Supply Scheme.

The announced allocations for water supply schemes in the QMDB in 2021/22 are shown in table 2.

Table 2: Announced allocations for QMDB water supply schemes

Water supply scheme	Announced Allocation – high priority (%)	Announced Allocation – medium priority (%)	Comments
Condamine and Balonne catchment			
Upper Condamine	100	100	Access to flows in the river from runoff downstream of the storage may be made available to entitlement holders separately to the announced allocation from the storage and is accounted against entitlements.
Chinchilla Weir	100	100	
Maranoa River	N/A	N/A	Announced allocations do not apply to this scheme.
St George	N/A	100*	Announced allocations only apply to entitlements managed as part of the bulk share.
Border Rivers catchment			
Border Rivers	N/A	N/A	
Macintyre Brook	100*	100*	Announced allocations only apply to entitlements managed as part of the bulk share.
Warrego catchment			
Cunnamulla	N/A	100	

* Announced allocations for the continuous share schemes (St George Water Supply Scheme and Macintyre Brook Water Supply Scheme) are as announced for the bulk share component. These numbers are different to those reported in the Data Submission Form for onward calculations.

- Actual take (*the quantity of water actually taken from the water resources of the water resource plan area during the water accounting period)*

A summary of the methods for determining actual take is provided below. More detail is available in the Condamine-Balonne, Queensland Border Rivers-Moonie and Warrego-Paroo-Nebine water accounting methods reports.

For the purpose of accounting for annual actual take from the Queensland Border Rivers SDL resource unit, the quantity of water actually taken for consumptive use by each form of

take from the SDL resource unit is interpreted to only apply to actual take within the resource unit, i.e., within the Queensland Border Rivers or within the New South Wales Border Rivers SDL resource unit. Actual take of water from the New South Wales Border Rivers SDL resource unit in Queensland is reported in accordance with the annual water use information provided by New South Wales. Approximately 11 GL of water from the New South Wales Border Rivers SDL resource unit was used in Queensland and no water from the Queensland Border Rivers SDL resource unit was used in New South Wales.

The take of water from watercourses under an entitlement and from overland flow by floodplain harvesting

Diversions in the QMDB generally include much greater volumes of unsupplemented water than supplemented water. In 2021/22, the availability of unsupplemented water and overland flow during flow events resulted in a reduced reliance on supplemented water (7% of take), compared to unsupplemented water (72%) and overland flow (21%).

Major water users in the QMDB have been metered to improve reliability in monitoring use. The installation of instruments to measure off-stream storage levels in the Lower Balonne was completed in the 2012/13 water year. Combined with measurement of direct take from the watercourse, this informs estimates of floodplain harvesting take in the area. A combination of estimated and measured water use is provided for all watercourse take and significant areas of floodplain harvesting.

The take of water from watercourses under basic rights

Water taken from watercourses under basic rights is not measured and is estimated using the method outlined in the Water Accounting Methods Report for the relevant water resource plan area.

The take of water by runoff dams (including take under basic rights)

The annual actual take of water by runoff dams in the Condamine-Balonne and Queensland Border Rivers-Moonie water resource plan areas is the long-term annual average limit estimated by the Authority, which is listed in Schedule 3 of the Basin Plan and identified in the relevant water accounting methods reports. The annual actual take of water by runoff dams in the Warrego, Paroo and Nebine catchments is estimated using the method outlined in the Water Accounting Methods Report for the Warrego-Paroo-Nebine Water Resource Plan.

The take of water by commercial plantations

The annual actual take of water by commercial plantations is the long-term annual average net take estimated by the Authority, which is listed in Schedule 3 of the Basin Plan and identified in the relevant water accounting methods reports.

There are no commercial plantations in the Moonie, Warrego, Paroo and Nebine catchments.

Summary of surface water take (SDL compliance)

All surface water SDL resource units were compliant with SDLs in the 2021/22 water year. Annual actual take was 84% of annual permitted take from all surface water sources for the Condamine-Balonne SDL resource unit, 50% for the Queensland Border Rivers, 45% for the Moonie, 60% for the Warrego, 99% for the Paroo and 90% for the Nebine SDL resource unit.

- Decisions affecting permitted take *(details of any other decisions made by, or under the law of, the Basin State, that permit the taking of water from the water resources of that area during that water accounting period)*

A total of 2 ML of surface water was made available in the QMDB for short-term use under water permits.

- Trade details *(details of the trading or transfer of tradeable water rights in relation to the water resources of that area during that water accounting period: within the area; and into the area; and from the area)*

Temporary and permanent trading of unsupplemented water access entitlements within a water management area and of supplemented water access entitlements within a water supply scheme (subject to specific rules in the water plan, water management protocol and operations manuals) may occur in all water resource plan areas in the QMDB. Water management protocols prohibit some trades where it has already been assessed that trade cannot occur without impacts to third parties or the environment.

Out of 158 GL of water access entitlements permanently transferred to new ownership in the QMDB in 2021/22, 135 GL was traded separately from land and 23 GL traded with land, with 86% of the total volume of permanent trades occurring in the Condamine-Balonne, 13% in the Queensland Border Rivers and less than 1% in the Warrego SDL resource unit. The volume of water permanently traded includes 9.6 GL of water access entitlements leased either with or separately to land. An additional 6.8 GL of water access entitlements had the location of take permanently changed without a change in ownership.

The New South Wales – Queensland Border Rivers Intergovernmental Agreement 2008 (the IGA) provides for permanent and temporary interstate trade of supplemented and unsupplemented water. This applies to water access entitlements in the Border Rivers water supply schemes and the Border Rivers Water Management Area. Take of water through works that are permanently linked to an entitlement for supplemented or unsupplemented water in the other state is not reported as trade for section 71 purposes because there is no transfer of entitlement.

In the Border Rivers catchment in 2021/22, approximately 5 GL of New South Wales supplemented water was authorised through temporary trade for use in Queensland. No Queensland surface water was authorised for use in New South Wales.

There was no temporary trade between consumptive and environmental entitlement pools in 2021/22 and no environmental entitlements were permanently traded back for consumptive use.

Groundwater

This section presents a summary of the key section 71 clauses of the *Water Act 2007* for groundwater resource plan areas (and SDL resource units where appropriate).

- Available water *(the quantity of water available from the water resources of the water resource plan area during that water accounting period)*

There is not considered to be any change to the available water overall (the available water being based on the long-term average recharge).

- Permitted take (*the quantity of water permitted to be taken from the water resources of the water resource plan area during the water accounting period)*

The annual permitted take is the SDL for the SDL resource unit, except in the SDL resource units in the Warrego-Paroo-Nebine Water Resource Plan, where the permitted take is the permitted take of water from the resource unit under entitlements plus the take of water permitted under basic rights.

Entitlements to take water from aquifers in the QMDB are in the form of water licences, water allocations (water access entitlements) or water permits, and these have conditions that identify the nominal entitlement (volumetric limit) and the source aquifer. Water licences were converted to water allocations for some alluvial aquifer subareas in June 2019. These included the Oakey, Dalrymple, Upper Condamine (Cunningham section) and Border Rivers (Deep) alluviums. In aquifers where the total entitlement volume is less than the permitted take volume, the water plan may identify a volume of unallocated water.

The take of groundwater for basic rights is authorised under the *Water Act 2000* (Qld) and does not require a water entitlement for the aquifers managed under the Basin Plan. Stock and domestic take is limited under the *Water Act 2000* and the volume taken is estimated for aquifers in the QMDB in accordance with the method in the relevant water accounting methods report.

- Decisions affecting permitted take *(details of any other decisions made by, or under the law of, the Basin State, that permit the taking of water from the water resources of that area during that water accounting period)*

A total of 10 ML of groundwater was authorised in the QMDB for short-term use (for mining operations in the Border Rivers Fractured Rock) under water permits. This is less than last year, likely due to the slightly wetter climatic conditions.

- Water allocations *(details of the water allocations made in relation to the water resources of that area in relation to that water accounting period)*

Access to the nominal entitlement for entitlement holders in a number of subareas is managed under an announced entitlement regime (a general restriction on take as a percentage of the nominal entitlement in accordance with rules in the relevant water management protocol). Additionally, access to the nominal entitlement for any entitlement holder can be limited when groundwater systems are exhibiting seasonal storage loss because of drought episodes or when longer term recharge has not been sufficient to

maintain groundwater levels in an aquifer, through limitations on take applied under the *Water Act 2000*.

Access in the Central Condamine Alluvium was limited to announced percentages of 50% or 70% prior to 2019 depending on their location within the system. The Central Condamine Alluvium limitations were at this level from 2011 until the water recovery process was completed. For the 2021/22 water year, the Central Condamine Alluvium was announced at 100% of nominal entitlement. Continued access will be managed under the Water Plan (Condamine and Balonne) 2019 through announced entitlements.

Due to good rainfall over the catchment area and subsequent groundwater level rises, restriction levels were either lifted or remained the same in most systems for the 2021/22 water year. The Oakey Creek management area was announced at between 70% and 80% across the four zones, whilst Dalrymple Creek Zone 1 was announced at 90% across all three zones. Cunningham Alluvium was limited to 75% in zones 1, 2 and 3 and 90% of nominal entitlement for zones 4 and 5. Jimbour Creek Alluvium was limited to 80% of nominal entitlement. Access in the Upper Hodgson Creek (basalt) system was lifted to 70% in Zone 1, however, remained at 60% for Zone 2 as little increase in water levels had been observed. The Toowoomba City Basalts remained at 60% of nominal entitlement.

The underground water management units subjected to limitations on take under the *Water Act 2000* are detailed in table 3. These are located in the Condamine and Balonne underground water management area.

Table 3: Limitations on take for the 2021/22 water year

SDL unit	Underground water management unit	% of nominal entitlement
Upper Condamine Alluvium (Tributaries)	Moola Creek Alluvium	50
	North Myall, Middle, Myall, Cains and Spring Creek Alluviums	70
	Campbells Gully Alluvium, Freestone Creek Alluvium, Glengallan Creek Alluvium, Gap Creek Alluvium, Millarvale Creek Alluvium	75
	Emu, Farm, Rosenthal and Swan Creek Alluviums	90
	Canal, Rodger, Greymare, Kings and Spring Creek Alluviums	80
	Condamine River Alluvium – upstream of the New England Hwy at Warwick	80
	Thanes, Cattle, Condamine River downstream of the CCA and remaining Tributary Alluviums	100
Upper Condamine Basalts	Toowoomba North Basalts	60
	Toowoomba South Basalts, Nobby Basalts, Warwick Basalts (within Kings Creek Administrative area)	60
	Warwick Basalts (outside Kings Creek Administrative area)	80

The increased rainfall and streamflow in the Upper Condamine from November 2021 onwards is reflected in groundwater monitoring in the latter half of the 2021/22 water year. This situation is expected to improve in the 2022/23 water year with ongoing above average rainfall and streamflow continuing in the catchment.

- Actual take *(the quantity of water actually taken from the water resources of the water resource plan area during the water accounting period)*

The take of water from aquifers under an entitlement

In many highly developed groundwater systems, the works of entitlement holders have been metered to improve the reliability in monitoring use. Water use is based on end of year meter readings. Note: where final meter readings are not recorded, full use is assumed.

In the systems that are unmetered, the nominal entitlement, adjusted for any limitations, is considered to represent the actual use. The estimated data are combined with the metered data to provide the total water use for an SDL resource unit.

The diversion of water from groundwater taken under entitlements for 2021/22 is 106 GL based on a combination of metered and estimated use. This does not include take under basic rights.

The take of water from aquifers under basic rights

Queensland does not require works (infrastructure that includes bores, wells, spears and excavations) that take water for the purpose of basic rights to be metered. Accordingly, use volumes have been estimated.

For the Queensland Border Rivers-Moonie, Condamine-Balonne and Warrego-Paroo-Nebine water resource plan areas, the permitted take for basic rights has been estimated using the method outlined in the Water Accounting Methods Report for the respective water plan area. The method is based on the 'Queensland Murray Darling Basin Methodology for Estimating the Take of Groundwater for Stock and Domestic Purposes' (Parsons Brinckerhoff, 2011) and also takes into account the report 'Methodology for determining growth in take of groundwater and accounting for groundwater take in the Granite Belt Underground Water Area' (WSP Parsons Brinckerhoff, 2018) which allows stock or domestic use to be separated from non-stock or domestic in the Granite Belt Underground Water Area. Prior to 2019/20 the estimated volume of take reported was the volume used by the MDBA in determining the SDL.

The total take of groundwater under basic rights for 2021/22 is 24.5 GL.

- Trade details *(details of the trading or transfer of tradeable water rights in relation to the water resources of that area during that water accounting period: within the area; and into the area; and from the area)*

Permanent trading of water access entitlements is permitted within the Upper Condamine Alluvium (Central Condamine Alluvium) area, as well as within the Border Rivers Alluvium (Deep) and the Oakey Creek, Dalrymple Creek and Cunningham Alluvium areas within the Upper Condamine Alluvium (Tributaries). Temporary trading (seasonal assignment) is also available within these areas, as well as in parts of the Upper Condamine Basalts

(Toowoomba City Basalts, Upper Hodgson Creek Basalts) and in the Queensland Border Rivers Alluvium (Deep and Shallow) areas. These permanent and temporary water sharing rules have been included in the respective Water Management Protocols and allow for greater water entitlement flexibility for licensees.

Permanent trades during the year totalled 1.8 GL. This figure includes both changes in location and trade of water with land for authorisations that may be traded separately to land. Temporary trade (through seasonal water assignments) was very active again during the year with 1.7 GL of groundwater temporarily traded across the QMDB area.

Summary of groundwater take

Rainfall totals for this year were significantly higher than last water year across the QMDB area. As a result of this, recharge is starting to be observed in some systems, allowing for some relaxation of restrictions. This, together with increased rainfall and access to alternative surface water supply, has resulted in a decrease in groundwater extraction for the 2021/2022 water year.

Total diversion of groundwater in the QMDB for 2021/2022 for all SDL resource units was 130 GL. Diversions (including basic rights) for all aquifer units were within the respective SDLs, (Border Rivers Fractured Rock not withstanding). A downward trend in diversions was reflected in all systems, again, primarily due to higher rainfall and increased access to surface water. The Central Condamine Alluvium (GS64a) showed a significant reduction in take with less than half of last year's water use recorded.

Table 4: 2021/22 Snapshot of water diversions in the QMDB

Resource	Annual actual take 2021/22 (GL)	Annual permitted take 2021/22 (GL)	Annual actual take 2020/21 (GL)	Annual permitted take 2020/21 (GL)
Surface water	1720	2357	1403	1542
Groundwater	130	399	152	399

Environmental water – held and planned

In Queensland, water planning incorporates provisions for balancing the often-competing interests in water between human consumptive needs and the environment. Environmental water requirements are primarily met through the various water sharing rules specified in the water plans, as well as through conditions on water access entitlements that limit when and how much water may be taken. In addition, there is held environmental water consisting of water access entitlements gifted by the Queensland Government to the Commonwealth and water which has been recovered by the Commonwealth from entitlement holders through the Water for the Future programs of buyback and investment in on-farm water use efficiency works.

Annual permitted take is reduced by the modelled volume of held environmental water entitled to be taken.

Information about the volume of held environmental water and its use can be found at http://www.environment.gov.au/water/cewo/catchment.

For the purposes of reporting under Matter 9.2 (volume of planned environmental water), Queensland has reported the volume of water provided for environmental purposes under specific flow event management rules in the relevant water management protocols. These rules include flow event management arrangements and preservation of tributary inflows in the Border Rivers; low, medium and Narran Lakes flow event management arrangements in the Lower Balonne; and flow event management arrangements in the Warrego. In 2021/22 these rules provided in-stream benefits in the Border Rivers (through flow event management arrangements and preservation of tributary inflows), the Lower Balonne distributaries (through release of environmental, stock and domestic water and flow event management arrangements) and the Warrego River (through flow event management arrangements).

No trading of environmental water occurred in the water year.

Cap compliance

Queensland reviewed the methods used to determine annual permitted take and annual actual take of water from a watercourse during the development of Basin Plan compliant water resource plans. The new methods and updated models with better data are also being used to assess Cap compliance.

All Cap valleys were compliant with long-term Cap limits in the 2021/22 water year.

Diversions from watercourses and floodplain harvesting reached 90% of the annual Cap target for the Condamine and Balonne catchment, 42% for the Border Rivers, 9% for the Moonie, 50% for the Warrego and 73% for the Nebine. There were no diversions accounted against the annual Cap target in the Paroo catchment for the 2021/22 water year.

Progress of water reform

The Warrego-Paroo-Nebine Water Resource Plan was accredited in June 2017. The Condamine-Balonne and Queensland Border Rivers-Moonie water resource plans were accredited in September 2019.

Surface water

Queensland's Rural Water Futures program is driving more transparent and sustainable rural water management across the state and is delivering better systems, policies, and processes to give confidence that our water resources are being managed fairly and responsibly. This is being implemented by a range of projects that collectively will deliver:

- a policy to strengthen measurement of all types of non-urban water use
- robust water accounting
- efficient and defensible compliance actions using fit-for-purpose tools
- systems and tools to proactively manage Queensland's water in 'real time'
- efficient and consistent customer-focused processes to manage entitlements
- transparent publication of water resource management information
- optimised trading in suitable locations
- legislation that is simple to interpret and supports our business and our customers.

A key project is the development of an overland flow measurement standard and risk-based overland flow measurement program to improve the measurement and accounting of take of overland flow on the floodplains.

Since 2000, Queensland has had a moratorium on new overland flow works in the QMDB water resource plan areas. Licensing of overland flow works on the floodplain started in these areas in the late-2000s and has been largely completed in the Lower Balonne. Good progress is being made on licensing the take of overland flow water through works in the Border Rivers and Moonie River floodplains. The measurement of overland flow water taken in these areas will be reviewed as part of the program.

More information is available at: https://www.rdmw.qld.gov.au/water/consultations-initiatives/rural-water-futures/projects/measurement-overland-flow.

Groundwater

The Authority, in conjunction with Queensland, have been engaged in several projects to gain a better understanding of groundwater systems in the QMDB. The projects have focussed on the heavily utilised and lesser-known groundwater systems to improve collective knowledge and assist in future planning. Two key projects in the Upper Condamine Alluvium are outlined below.

Upper Condamine Alluvium modelling

> Improved assessment and modelling of the Central Condamine Alluvium (CCA) will help to inform the longer-term sustainable capacity of the system and look at potential changes in the system as buyback recovers entitlements. The Upper Condamine Alluvium project has been finalised with the incorporation of the tributary alluvial systems into the CCA model. The construction and calibration of the model according to currently accepted modelling guidelines were completed in January 2018. The final model was completed in August 2021.

Upper Condamine Alluvium (UCA) (Tributaries) – Hydrogeological and hydrochemical characterisation of recharge and connectivity

> This work is investigating geochemical and thermal signatures of various water sources to assist in determination of the degrees of connectivity (if any), which will improve knowledge and better inform future management and trade arrangements.