SNOWY HYDRO WATER OPERATIONS REFERENCE REPORT

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GLOSSARY OF TERMS USED IN THIS WATER OPERATIONS REFERENCE REPORT

TERM	MEANING
Above Target Water	Inflows that occur when Snowy Scheme storages are above Target Storage. This water is not required to make current and future year's Required Annual Releases.
AWOP	Each water operating plan prepared annually by Snowy Hydro and approved by the Ministerial Corporation under the Snowy Water Licence.
Below Target Water	Inflows that occur when Snowy Scheme storages are below Target Storage. This water is required to make current and future year's Required Annual Releases.
Corporation Date	28 June 2002, being the date on which the *Snowy Mountains Hydro-electric Power Act 1949 (Cth)* was repealed by the *Snowy Hydro Corporatisation Act 1997 (Cth)*.
Development	Either the Snowy- Murray Development or the Snowy- Tumut Development and "Developments" means both of them.
Dry Inflow Sequence Formula	The predictive tool set out in clause 8 of Schedule Four to the Snowy Water Licence which calculates the "Dry Inflow Sequence Volume".
Dry Inflow Sequence Volume or "DISV"	With respect to each Water Year and each Development, the volume of water calculated using the Dry Inflow Sequence Formula.
DSE	The Victorian Department of Sustainability and Environment.
DWE	The NSW Department of Water and Energy.
Environmental Entitlement	The environmental entitlements known as the Snowy- Murray Development (River Murray) Environmental Entitlement and the Snowy-Tumut Development (Murrumbidgee River) Environmental Entitlement as referred to in the SWIOID.
GL	Gigalitre. 1 gigalitre = 1,000 megalitres. 1 megalitre = 1 million litres
KNP	The Kosciuszko National Park.
NEM	The National Electricity Market.
NSW Corporatisation Act	The *Snowy Hydro Corporatisation Act 1997 (NSW).*

MDB Agreement	The Murray- Darling Basin Agreement made on 24 June 1992 between the Commonwealth, New South Wakes, Victoria and South Australia.
MDBA	The Murray- Darling Basin Authority.
Ministerial Corporation	The Water Administration Ministerial Corporation constituted under section 371 of the *Water Management Act*
ML	Megalitre. 1 megalitre = 1 million litres and 1,000 megalitres = 1 gigalitre.
Quarterly Guaranteed Minimum Releases	The Water Consultation and Liaison Committee agreed following the 2002-03 Water year that rather than provide a likely lower bound of quarterly releases, in each Annual Water Operating Plan Snowy Hydro should provide Quarterly Guaranteed Minimum Releases as a firm release commitment subject only to force majeure.
Release Targets	In recognition of the engineering realities of such a large and complex Scheme, through the Snowy Water Licence the Ministerial Corporation acknowledges that in operating the Snowy Scheme the Licensee cannot achieve precise release volumes each Water Year but, rather, can only target a release volume. Any surplus or deficit against a target is carried forward to the next Water Year.
Required Annual Release	Snowy Hydro's requirement to release a calculated volume of water from the Developments each Water Year under the Snowy Water Licence.
River Murray Increased Flows	Each year the annual allocation to River Murray Increased Flows is credited to the Snowy- Murray Above Target Water Account. When an Above Target Water release is made from the Snowy- Murray development, the MDBA can choose to allocate that release to environment uses to the extent of the accumulated River Murray Increased Flow account.
Seasonal Availability	A combination of the final seasonal allocation announcement of the relevant State during the previous Water Year and the allocated volume received during the previous Water Year by South Australia as a proportion of its entitlement during that Water Year under the MDB Agreement.
Snowy Agreement 1957	The agreement between the NSW, Victorian and Australian Governments attached to the Snowy Mountains Hydro- electric Authority Act 1960 (Cth).
Snowy Bilateral Deed	The Deed entered into between the State of Victoria and Snowy Hydro dated 31 May 2002.
Snowy Montane Rivers Increased Flows	The additional flows that Snowy Hydro must allow to pass through or over certain of its regulating structures.
Snowy River Increased Flows	Releases to be made from Jindabyne Dam into the Snowy River.

Snowy Scientific Committee	A committee established by the Minister administering the NSW Corporatisation Act to advise the Ministerial Corporation on releases relating to the Snowy Scheme and the Snowy Water Licence.
Snowy Scheme	The Snowy Mountains Hydro- electric Scheme.
Snowy Water Year	The period of 12 calendar months commencing on 1 May and concludes on 30 April.
SWIOID	Means the Snowy Water Inquiry Outcomes Implementation Deed dated 3 June 2002.
Target Storage	Means the volume of storage of the Snowy Scheme which is required, to meet current and future years' nominal Required Annual Releases through the design dry inflow sequence.
Water Act	Means the *Water Act 2007 (Cth)*
Water for Rivers	Means the business name of the Joint Government Enterprise, a public company established by the Commonwealth, NSW and Victorian Governments.
Water Management Act	Means the *Water Management Act 2000 (NSW).*
WCLC	Means the Water Consultation and Liaison Committee.

INTRODUCTION

1. PURPOSE OF THIS DOCUMENT

1.1 Statement of Purpose

Snowy Hydro owns and operates the Snowy Scheme. The Snowy Scheme is a large and complex water storage and diversion scheme. The costs of operating and maintaining the Snowy Scheme are met through Snowy Hydro's participation in the NEM. To balance the needs of both downstream water interests and electricity market imperatives, the Snowy Scheme's water operations are subject to a comprehensive and highly inter- related regulatory regime.

In the five years since corporatisation of the Snowy Scheme, there has been a growth of stakeholder views about how Snowy Hydro operates the Snowy Scheme that demonstrate a lack of understanding about the various arrangements and accountabilities concerning the water operations of the Snowy Scheme. Snowy Hydro has identified that this lack of understanding is principally due to a lack of information provided to stakeholders about the regulatory regime under which Snowy Hydro operates the Snowy Scheme. These stakeholders are both within Governments and the general community.

Whilst it is the clear role of Governments to facilitate an understanding of their regulatory arrangements, Snowy Hydro has decided to take a proactive step towards addressing this obvious knowledge gap, in particular as a result of submissions made to the five year review of the Snowy Water Licence.

This report sets out in summary form key information about the water operations of the Snowy Scheme, including:

(1) the physical water operations and its operating principles;

(2) the regulatory regime;

(3) Snowy Hydro's interaction with other parties;

(4) how releases fit in with the electricity market and downstream water users; and

(5) environmental releases.

Snowy Hydro hopes that this reference document may also assist the Governments in commencing a broader communication programme to ensure that stakeholders have access to information that enables them to develop a clearer understanding of how the Snowy Scheme is managed and operated.

THE WATER OPERATIONS OF THE SNOWY SCHEME

2. SNOWY HYDRO

Snowy Hydro is mainland Australia's largest renewable energy generator and accounts for more than 70% of renewable energy production in the mainland NEM.

Snowy Hydro owns and operates the 3,800 MW Snowy Scheme. It also owns and operates the 300MW Valley Power and 320MW Laverton North gas-fired power stations located in Victoria and Red Energy, an electricity and gas retailer operating primarily in Victoria and South Australia.

Snowy Hydro is the NEM's second largest generator by capacity. Its portfolio of hydro generation assets and its gas- fired peaking capacity places it in a strong position to take advantage of periods of high demand in the NEM spot market. Snowy Hydro generally targets its generation to periods of high demand, which normally correlate with periods of higher spot market prices.

Snowy Hydro is a leading supplier of electricity price risk hedging contracts such as price caps and similar contracts to other NEM participants (retailers and other generators) who are seeking protection to limit the price risk they face in the NEM spot market. Snowy Hydro's ability to draw on large-scale generation at short notice means that it is able to offer such contracts, and generally hedge the risk it takes on under those contracts by generating electricity as required.

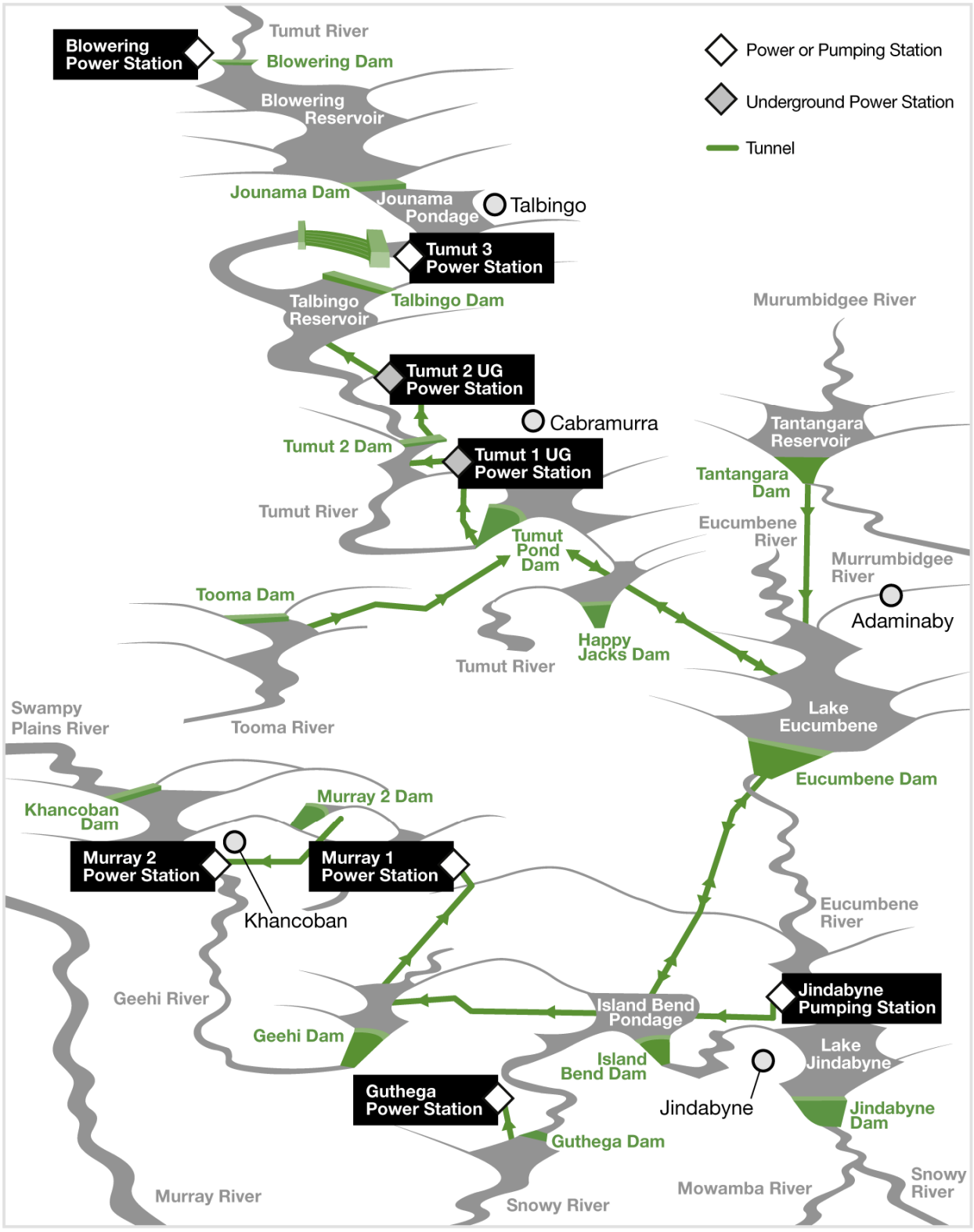
3. THE SNOWY SCHEME

3.1 Introduction

Located predominantly in the **KNP**, the Snowy Scheme consists of a network of seven power stations, 32 generating units, 16 dams and 225 kilometres of tunnels and aqueducts dispersed over a catchment area of 5,124 square kilometres.

The Snowy Scheme was designed to produce electrical energy, but one of the objectives of the Snowy Scheme was to mitigate the effects of drought on irrigated agriculture in New South Wales and Victoria. The Snowy Scheme collects and stores water, including water that would naturally flow east of the Snowy Mountains to the coast, diverting it through trans-mountain tunnels and power stations and then releasing it west of the Snowy Mountains into the catchments of the River Murray and the Murrumbidgee River where it can be used for town water supply, irrigation and environmental uses.

The Snowy Scheme comprises two major developments: the northern Snowy-Tumut Development and the southern Snowy-Murray Development.


Power or Pumping Station
Underground Power Station
Tunnel
Blowering Power Station
Tumut River
Blowering Dam
Blowering Reservoir
Jounama Dam
Jounama Pondage
Talbingo
Tumut 3 Power Station
Talbingo Reservoir
Talbingo Dam
Murumbidgee River
Tumut 2 UG Power Station
Cabramurra
Tantangara Reservoir
Tumut 2 Dam
Tumut 1 UG Power Station
Tantangara Dam
Tumut River
Eucumbene River
Tumut Pond Dam
Murrumbidgee River
Tooma Dam
Adaminaby
Happy Jacks Dam
Tumut River
Swampy Plains River
Tooma River
Lake Eucumbene
Eucumbene Dam
Khancoban Dam
Murray 2 Dam
Murray 2 Power Station
Murray 1 Power Station
Khancoban
Eucumbene River
Geehi River
Jindabyne Pumping Station
Island Bend Pondage
Geehi Dam
Lake Jindabyne
Island Bend Dam
Guthega Power Station
Jindabyne
Jindabyne Dam
Guthega Dam
Snowy River
Murray River
Mowamba River
Snowy River

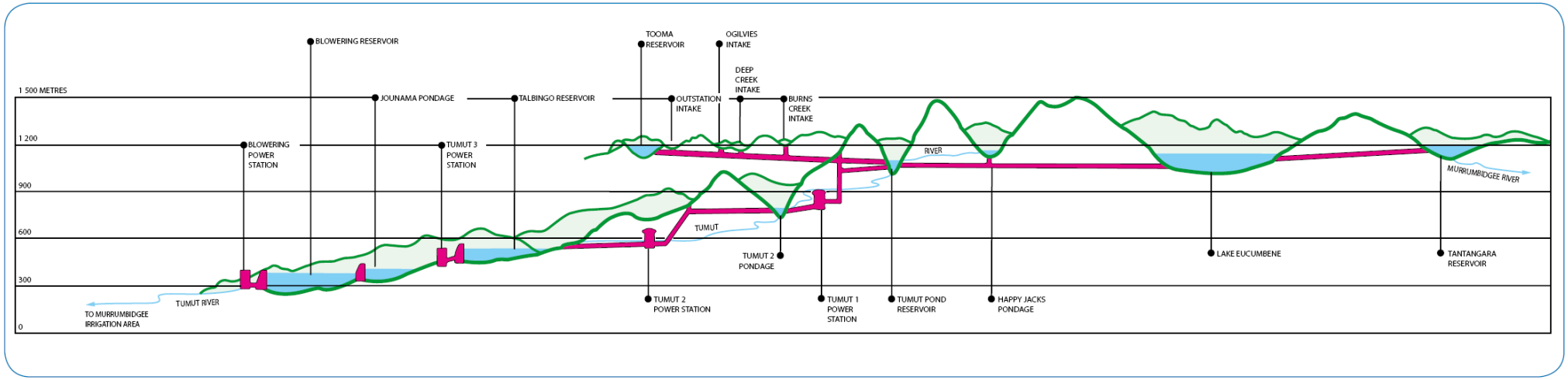
3.2 The Snowy-Tumut Development

The Snowy-Tumut Development currently consists of four power stations and 15 generating units and has a total generation capacity of 2,196MW.

The Snowy-Tumut Development collects the headwaters of the upper Murrumbidgee, Tooma and Eucumbene Rivers. Those waters are diverted through trans-mountain tunnels to Tumut Pond Dam. There they join the waters of the Tumut River and flow through Tumut 1 and Tumut 2 underground power stations discharging into Talbingo Reservoir.

Water stored in Talbingo Reservoir then passes through the Tumut 3 Power Station and into Jounama Dam. Three of the six generators at Tumut 3 Power Station have pumps that can be used to pump water from Jounama Dam back up into Talbingo Reservoir, thereby "recycling" water. Water is released from Jounama Dam into Blowering Reservoir. A small hydro power station is currently under construction at Jounama Dam.

Blowering Power Station is located on Blowering Dam and is leased from State Water. Water releases from Blowering Dam are controlled by State Water, a NSW State Owned Corporation, to provide for town water supply, irrigation and environmental use requirements. Blowering Power Station is therefore a "run of river" plant that operates as State Water releases water from Blowering Dam into the Tumut River to join the Murrumbidgee River near Gundagai.



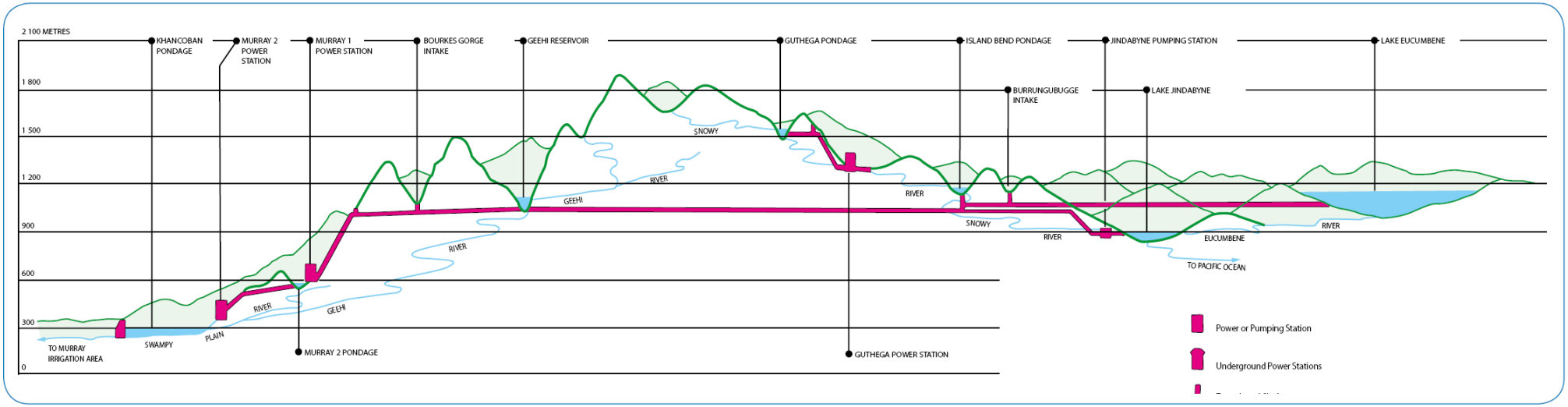
3.3 The Snowy-Murray Development

The Snowy-Murray Development consists of three power stations and 16 generating units and has a total generation capacity of 1,560MW.

Water in the upper Snowy River is diverted at Guthega Dam through Guthega Power Station. Inflows into the relatively small Guthega Pondage are seasonal.

During times of high inflows, water flowing into Island Bend Pondage is directed to Lake Eucumbene for storage and subsequently transferred to the River Murray catchment. At times of low inflows, water from Island Bend is diverted directly to Geehi Reservoir through a trans-mountain tunnel together with water which flows back from Lake Eucumbene and supplemented with water pumped from Lake Jindabyne. Pumps lift water from Lake Jindabyne, normally using off-peak power, to discharge into Geehi Reservoir on the western side of the Great Dividing Range.

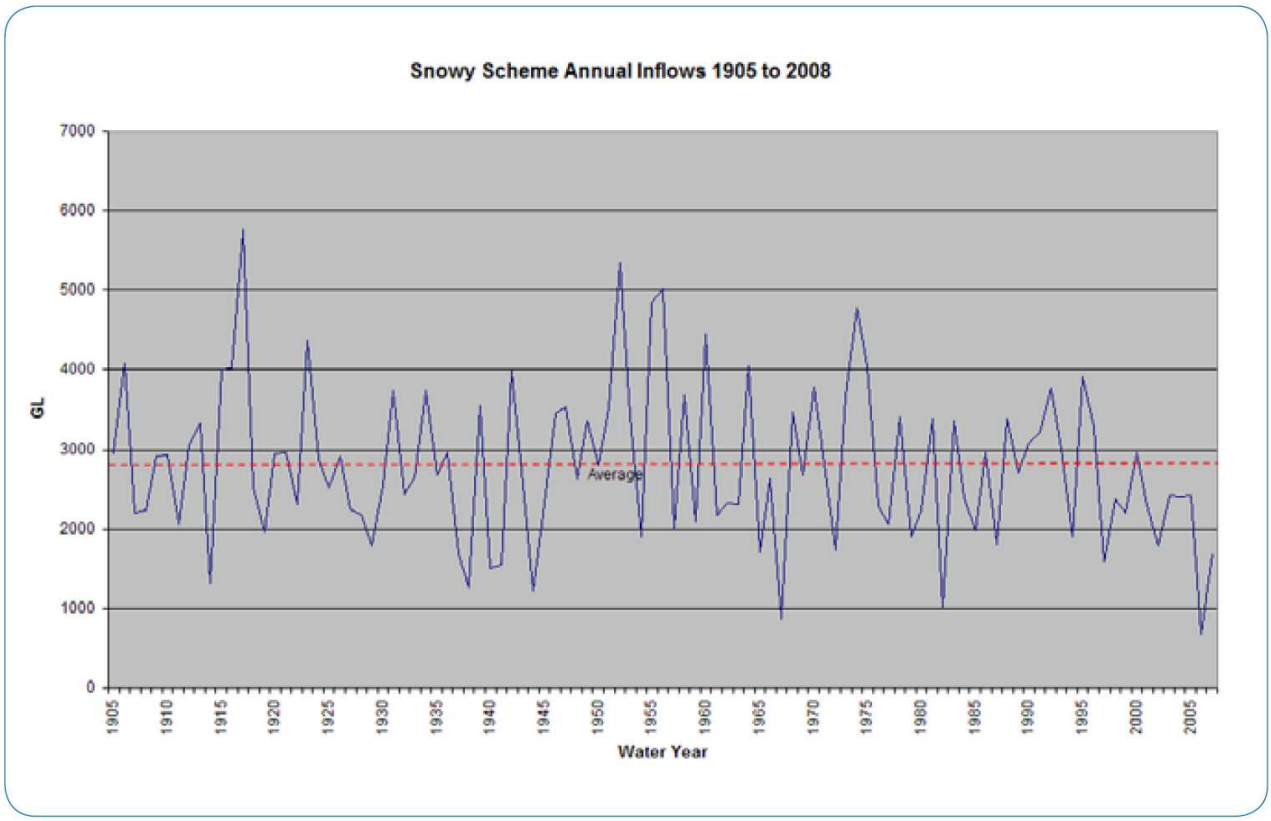
There, with additional water from the Geehi River, the water passes through Murray 1 and Murray 2 power stations. Khancoban Dam regulates water released from Murray 2 power station down the Swampy Plain River which is a tributary of the upper River Murray.



4. THE DESIGN OF THE SNOWY SCHEME

4.1 Highly Variable Annual Inflows

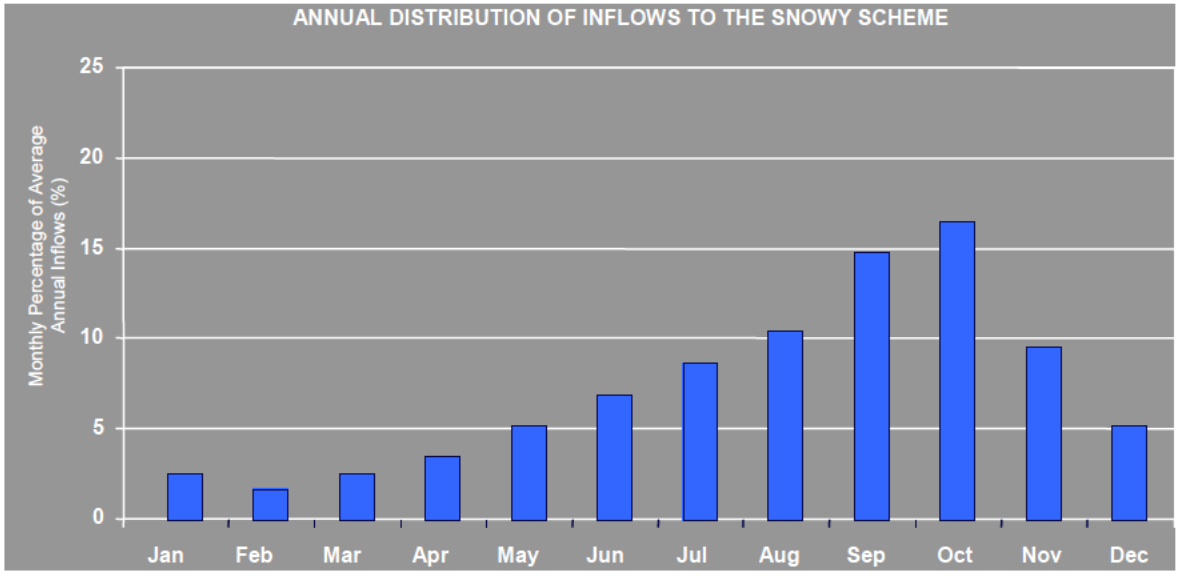
There is significant variability in the volume of inflows into the Snowy Scheme's catchment between years. This is illustrated in the graph below. Annual inflows into the Snowy Scheme have varied from 683 GL during drought years to 5,760 GL during wet years. This is a range from 24% to 203% of average annual inflows, where the average annual inflows are 2,825 GL.



4.2 Seasonal Inflows

The physical structures of the Snowy Scheme have been designed to capture inflows at times of spring run-off. Much of the Snowy Scheme's catchment is made up of alpine areas where several months of precipitation builds up a snow-pack over winter. As temperatures rise in spring, this snow- pack melts, often quite rapidly. This spring run-off is initially captured in the Snowy Scheme's short term storages. The Snowy Scheme's network of tunnels enables these inflows to be diverted from those short term storages into Lake Eucumbene for long term storage.

About half of the Snowy Scheme's annual inflows occur during the months of August to November.



4.3 Large Storage for Reliable Releases

The Snowy Scheme has a total active storage capacity of 5,300 GL, which is about double the volume of the average annual inflows. This large active storage capacity allows the Snowy Scheme to collect water during wet years, store that water and release it through subsequent dry years.

Historically the reliability of releases from the Snowy Scheme is best illustrated by their contribution to mitigating the effects of drought on irrigated agriculture in NSW and Victoria:

(1) on the River Murray as at Hume Dam, the Snowy Scheme contributes inflows of only 8% during average inflow years but 33% during drought years; and

(2) on the Murrumbidgee River as at Wagga Wagga, the Snowy Scheme contributes inflows of 25% during average inflow years and 60% during drought years.

THE OPERATING PRINCIPLES OF THE SNOWY SCHEME FROM A WATER PERSPECTIVE

5. THE OPERATING PRINCIPLES OF THE SNOWY SCHEME

5.1 Introduction

To ensure that the benefits of the Snowy Scheme could be maximised for both water security and electricity generation, a set of operating principles and water accounting rules was developed under the 1957 *Snowy Agreement*.

On corporatisation of the Snowy Scheme in 2002, the key elements of those operating principles and accounting rules were codified and carried forward in the *Snowy Water Licence*, which is described below in more detail along with the other key elements of the comprehensive regulatory regime surrounding the water of the Snowy Scheme.

Those principles and rules are:

(1) catchment- based sharing of inflows;

(2) the target storage principle;

(3) Above Target Water and Below Target Water;

(4) Required Annual Releases to western rivers; and

(5) the Dry Inflow Sequence Volume.

5.2 Catchment Based Sharing of Inflows

Despite much of the Snowy Scheme's inflows being diverted into one storage reservoir, Lake Eucumbene, Snowy Scheme operations and water accounting must preserve a catchment- based sharing of inflows as follows:

(1) the waters of the Snowy River are to be diverted to the River Murray; and

(2) the waters of the Tooma River, the Upper Murrumbidgee River and the Eucumbene River are to be diverted and, together with the waters of the Tumut River, released into Blowering Reservoir, and hence to the Tumut River and then Murrumbidgee River.

This catchment- based sharing of inflows is required to preserve the arrangements between the States of New South Wales and Victoria for the sharing of releases from the Snowy Scheme, namely that:

(1) water released from the Snowy-Tumut Development is allocated 100% to NSW; and

(2) water released from the Snowy-Murray Development is shared 50:50 between New South Wales and Victoria.

5.3 Required Annual Releases to the Western Rivers

Under the Snowy Water Licence Snowy Hydro is required to operate the Snowy Scheme so as to release a calculated volume of water from each of the two Developments each Water Year. These releases are referred to as "Required Annual Releases".

The nominal Required Annual Release for each of the two Developments is:

(1) 1,062 GL from the Snowy-Murray Development to the River Murray catchment; and

(2) 1,026 GL from the Snowy-Tumut Development to the Murrumbidgee River catchment.

The nominal volumes referred to above were calculated as follows.

If the Snowy Scheme was at the Target Storage volume and then experienced inflows equivalent to the design dry inflow sequence, the Snowy Scheme would be capable of releasing those nominal volumes each year through that sequence and the Snowy Scheme would not fail (run out of water) before inflows recovered.

The corollary of this is that if the Snowy Scheme experiences inflows that are lower than the design dry inflow sequence, the Snowy Scheme is not capable of releasing the full nominal Required Annual Releases. Refer to Dry Inflow Sequence Volume below.

In each year the actual calculated Required Annual Release volume varies from the nominal volume referred to above. For example, the volume of water savings for environmental releases is deducted from the nominal Required Annual Release. These calculations are performed in accordance with the methods and principles of the Snowy Water Licence and approved by DWE in each year's AWOP.

5.4 The Target Storage Principle

The Snowy Scheme is operated relative to a Target Storage. That is, if the Snowy Scheme was at the Target Storage volume and then experienced inflows equivalent to the design dry inflow sequence (refer below), the Snowy Scheme would be capable of releasing the nominal Required Annual Release each year through that sequence and the Snowy Scheme would not fail (run out of water) before inflows recovered.

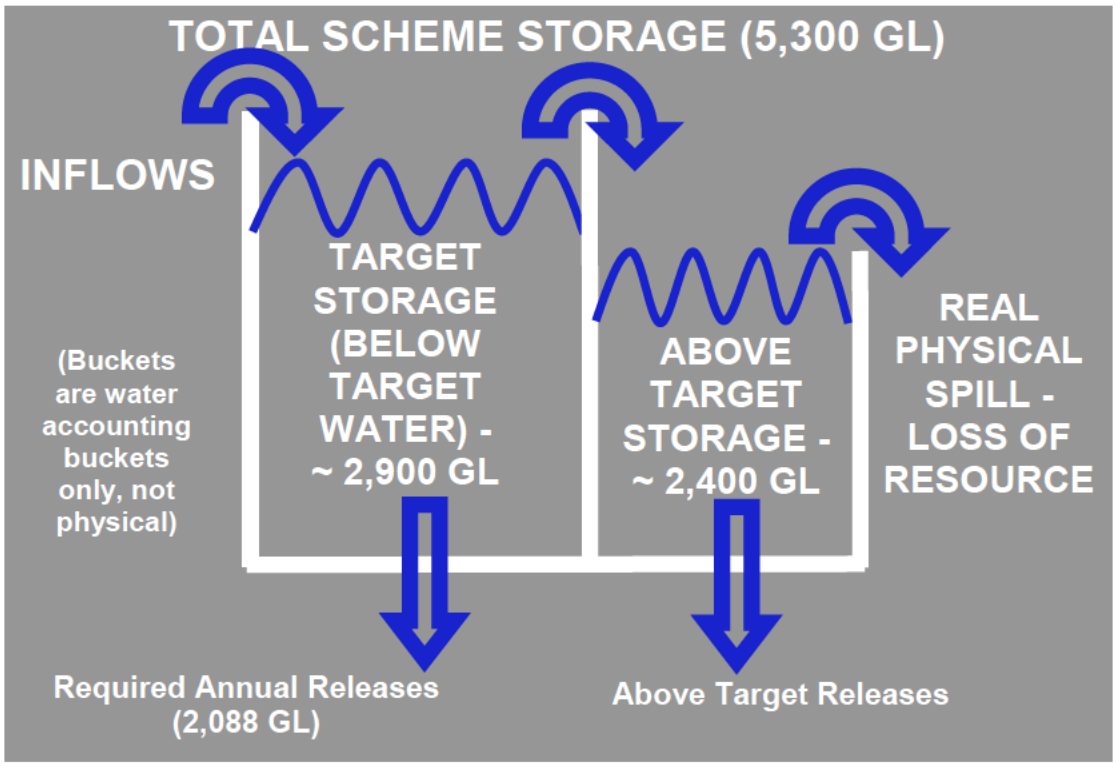
In practical terms, the Target Storage is the volume of storage required to meet current and future years' nominal Required Annual Releases through the design dry inflow sequence. The Target Storage is a fixed volume for each month of the year that varies across months but is the same for each corresponding month each year.

Month	Target Storage (GL) Snow-Murray Development	Target Storage (GL) Snowy-Tumut Development
January	1510	1660
February	1520	1670
March	1460	1610
April	1410	1530
May	1340	1460
June	1290	1410
July	1240	1350
August	1170	1300
September	1190	1490
October	1240	1580
November	1400	1590
December	1450	1580

5.5 Above Target Water and Below Target Water

At any time that Snowy Scheme storages are below Target Storage, inflows into the Snowy Scheme must be allocated to meet current and future years' nominal Required Annual Releases. These inflows are therefore accounted as "Below Target Water".

At any time that Snowy Scheme storages are at or above Target Storage, inflows into the Snowy Scheme are not required to meet current and future years' nominal Required Annual Releases. These inflows can be thought of as being surplus to the water security objective for the Snowy Scheme. These inflows are therefore accounted as "Above Target Water".



5.6 Timing of releases

The Snowy Water Licence also regulates the timing of releases of water from the Snowy Scheme.

The calculated releases of Below Target Water are prescribed in the Snowy Water Licence as being an annual release requirement. That is, generally speaking the Snowy Water Licence does not prescribe within- year release requirements with respect to Required Annual Releases. This ensures that for water allocation purposes downstream of the Snowy Scheme there is sufficient certainty of supply across water years and that there is sufficient flexibility of timing of releases for generation purposes within each water year.

However, under each AWOP, Snowy Hydro is required to specify and meet Guaranteed Quarterly Minimum Releases from each Developments.

Although not strictly a timing of release constraint, it is also worth noting here that under the Snowy Water Licence when State Water's Blowering Dam is spilling and the flow immediately downstream of Blowering Dam exceeds the operating channel capacity of the Tumut River, the volume of releases from the Snowy-Tumut Development via Jounama Dam is limited to the daily volume of natural inflows to Jounama Dam.

Due to the fact that Above Target Water is surplus to the water security objective of the Snowy Scheme, Snowy Hydro has discretion on the timing and quantities of Above Target Water releases both within and across water years.

Under the Snowy Water Licence, any releases made in a Water Year in excess of the calculated Required Annual Release for each Development is deemed to be a release of Above Target Water.

5.7 Dry Inflow Sequence

The 1936 to 1946 “design dry inflow sequence” used to calculate the nominal volume of the Required Annual Releases, was considered to be a severe drought at the time of the construction of the Snowy Scheme. However, at that time it was also recognised that because of the relatively short length of the historical record for inflows, a worse dry inflow sequence could occur.

In simple terms, if:

(1) the Snowy Scheme storages were “on target”;

(2) the Snowy Scheme catchment then experienced an inflow sequence worse (drier) than the design dry sequence; and

(3) over that period Snowy Hydro still targeted for release 2,088 GL each year;

the Snowy Scheme would run out of water.

The Snowy Water Licence therefore contains a predictive tool that is designed to calculate the Snowy Scheme’s future ability to meet the Required Annual Releases. This predictive tool is called the Dry Inflow Sequence Formula and the measure it calculates is known as the Dry Inflow Sequence Volume.

The Dry Inflow Sequence Formula predicts, on the basis of annual lowest on record inflow conditions, whether the current inflow sequence is worse (drier) than the design dry sequence. If it is, the measure of the difference, the DISV, is then deducted from the volume of the calculated Required Annual Release. This effectively delays the Snowy Scheme running out of water.

The DISV is calculated at the beginning of every month. Therefore, at times where there is a DISV amount, the volume of the calculated Required Annual Releases is adjusted monthly. However, the DISV does not change in the last two months of each water year. To the extent that inflows recover during those last two months, the following year’s calculated Required Annual Release is increased.

THE REGULATORY REGIME GOVERNING WATER AND THE SNOWY SCHEME

6. THE SNOWY SCHEME WATER REGULATORY REGIME

6.1 Introduction

Snowy Hydro's water rights and obligations are granted and imposed under the Snowy Water Licence. However, the overall water regulatory regime comprises a series of highly inter-related legal instruments.

6.2 The Water Act

The Water Act) provides the legislative framework for the Commonwealth Government to assume significant planning and management powers and responsibilities for water resources in the Murray- Darling Basin.

The Water Act establishes an independent Murray- Darling Basin Authority (which replaced the Murray- Darling Basin Commission) The Murray- Darling Basin Authority is required under the Water Act to prepare a strategic Basin Plan for the Murray- Darling Basin which will be complimented by Water Resource Plans prepared by Basin States.

The Water Act also establishes a Commonwealth Environmental Water Holder to manage the Commonwealth's environmental water in the Murray-Darling Basin.

6.3 The Murray-Darling Basin Agreement

The MDB Agreement is an inter-governmental agreement annexed to legislation of several Parliaments including those of the Commonwealth and the States of New South Wales, Victoria and South Australia. As a matter of law, the MDB Agreement has the character of legislation.

Following corporatisation of the Snowy Scheme, a new Schedule G was inserted into the MDB Agreement. Among other things Schedule G replicates the provisions of Schedule Four to the Snowy Water Licence relating to the water available to the Snowy- Murray Development and water releases from that Development, including Snowy River Increased Flows.

The effect of this particular inclusion is that the MDBA accounts releases from the Snowy-Murray Development in accordance with Schedule G. That is, those releases are allocated 50:50 to the States of New South Wales and Victoria as set out in the Schedule G formula unless agreed otherwise by the MDBA.

The new Schedule G to the MDB Agreement also:

(1) implements new arrangements for sharing water made available from the Snowy Scheme to the River Murray catchment above Hume Dam;

(2) secures Victoria's water rights (and consequently those of South Australia)

which were contained in the original Snowy Agreement; and

(3) requires the MDBA to adjust water accounts to restore the status quo if New South Wales amends the Snowy Water Licence in a way which alters Victoria's access to water.

6.4 Snowy Hydro Corporatisation Act

The Snowy Hydro Corporatisation Act is the legislation that enabled the corporatisation of the Snowy Scheme. The Snowy Hydro Corporatisation Act is complementary legislation of each of the Commonwealth, New South Wales and Victorian Parliaments.

In relation to water, the NSW Corporatisation Act deals with two important matters. First, it sets out the terms and timing for the Snowy Water Inquiry which was to examine environmental issues arising in rivers and streams from the operations of the Snowy Scheme. Second, it establishes the entitlement of Snowy Hydro to the Snowy Water Licence and prescribes the basic rights and obligations that are to be contained in the Snowy Water Licence.

6.5 The Snowy Water Inquiry Outcomes Implementation Deed

The SWIOID is a legally binding and enforceable agreement between the Commonwealth, New South Wales and Victorian Governments. Snowy Hydro is not a party to the SWIOID.

The SWIOID:

(1) sets out the three Governments' commitment to achieve water efficiency savings and the methodology they will apply to accounting for the water efficiency savings; and

(2) establishes the WCLC, which is given the right to review and provide comment on each draft Annual Water Operating Plan prepared by Snowy Hydro.

Under the NSW Corporatisation Act and the Water Management Act, it is the duty of DWE to exercise its function of issuing a Snowy Water Licence under Part 5 of the NSW Corporatisation Act consistent with the terms of the SWIOD.

Further, the Snowy Water Licence requires that in administering the licence DWE must act in a manner that is consistent with and is necessary or desirable to give full effect to the SWIOID.

6.6 The Snowy Water Licence

The Snowy Water Licence is a statutory instrument issued under Part 5 of the NSW Corporatisation Act.

The Snowy Water Licence embodies the operating and accounting principles described above.

The Snowy Water Licence confers the following rights on Snowy Hydro:

(1) to collect all water from the rivers, streams and lakes within the Snowy Water

Catchment;

(2) to divert that water;

(3) to store that water;

(4) to use that water to generate electricity and for purposes that are incidental or related to the generation of electricity; and

(5) to release that water from storage.

Snowy Hydro's rights are subject to the rights of certain other occupiers to take and use water (for example, local councils).

In addition to these rights, the Snowy Water Licence also sets out Snowy Hydro's water related obligations, in particular release obligations.

The Snowy Water Licence gives effect to the provisions of the SWIOID (refer above).

The Snowy Water Licence expires on the 75th anniversary of the Corporation Date being 28 June 2077. There is no provision in the Snowy Water Licence or the NSW Corporatisation Act for the renewal or extension of the Snowy Water Licence term beyond this date.

6.7 Annual Water Operating Plans

Under the Snowy Water Licence, each Snowy Water Year Snowy Hydro is required to develop and then comply with an AWOP approved by the Ministerial Corporation.

The purpose of each AWOP is to provide Commonwealth and State water authorities with details of how Snowy Hydro proposes to operate the Snowy Scheme to meet the requirements of Schedule 3 (environmental flow requirements) and Schedule 4 (western river releases) to the Snowy Water Licence.

Each AWOP contains the following information:

(1) a detailed review of previous water year operations, including inflows, diversions, storage changes and releases;

(2) factors affecting operations for the coming water year, such as major plant outages; and

(3) details of the planned operations for the coming water year, including the Required Annual release volume, Quarterly Guaranteed Minimum Releases and Environmental Flow targets.

The process of developing each AWOP involves Snowy Hydro preparing a draft, which is then reviewed by the WCLC. Snowy Hydro must consider the WCLC's comments and provide a revised plan to DWE. DWE then considers the plan and, if satisfied, approves it. Any subsequent amendments to each AWOP must also be reviewed by the WCLC and approved by DWE.

SNOWY HYDRO'S INTERACTIONS WITH OTHERS ON WATER ISSUES

7. INTERACTION WITH OTHERS

7.1 Introduction

There are a number of organisations and committees that Snowy Hydro interacts with on water matters. Following is a summary of those groups and their purpose.

7.2 DWE / Ministerial Corporation

The Ministerial Corporation is established under the Water Management Act. The Ministerial Corporation is a statutory body representing the Crown and has various functions with regard to carrying out water management works, monitoring and research and other activities for the purpose of enabling the objectives of the Water Management Act to be attained.

The Ministerial Corporation issued and now administers the Snowy Water Licence and is represented on the WCLC (see below). Effectively, the Ministerial Corporation and DWE are one and the same.

DWE is responsible for accounting for Snowy-Tumut Development inflows and releases. Snowy Hydro provides DWE with water resource data to assist with these accounting processes.

7.3 Victorian Department of Sustainability and Environment

Whilst the Snowy Water Licence is administered by the Ministerial Corporation, the Victorian Government and Snowy Hydro are parties to a legally binding and enforceable agreement called the Snowy Bilateral Deed. The purpose of the Snowy Bilateral Deed is to give Victoria legally enforceable remedies against Snowy Hydro for breach of the Snowy Water Licence. The Snowy Bilateral Deed is administered on behalf of the Victorian Government by DSE.

DSE is also represented on the WCLC (see below).

7.4 Murray Darling Basin Authority

The MDBA is responsible for accounting for Snowy-Murray Development inflows and releases in accordance with the MDB Agreement. Snowy Hydro provides the MDBA with water resource data to assist with these accounting processes and River Murray operations.

MDBA is also represented on the WCLC (see below).

7.5 NSW State Water Corporation

NSW State Water Corporation is responsible for River operations of the Murrumbidgee River. Snowy Hydro provides State Water with water resource data to assist with these

operations. Snowy Hydro also leases Blowering Power Station from State Water.

7.6 Water Consultation and Liaison Committee

The WCLC is established under the SWIOID to assist the Ministerial Corporation to fulfil its regulatory function in administering the Snowy Water Licence. It is responsible for reviewing and providing comment on each draft AWOP prepared by Snowy Hydro and any proposed amendment to an approved AWOP.

Currently the WCLC comprises representatives from DWE, DSE, MDBA, the Commonwealth Department of Industry and Snowy Hydro.

7.7 Snowy Hydro Consultative Committee

The Snowy Hydro Consultative Committee was established by the NSW Government in 2006. It is chaired by the New South Wales Irrigators' Council and comprises representatives from the three irrigation Corporations that operate on the Murrumbidgee River and the NSW side of the River Murray. The Committee's purpose is to facilitate direct communication between Snowy Hydro and NSW irrigators. Currently the committee meets quarterly.

7.8 Water for Rivers

Water for Rivers is the business name of the Joint Government Enterprise, a public company established by the Commonwealth, NSW and Victorian Governments to achieve significant improvements in environmental flows into the Snowy River and the River Murray. Those increased flows are to be generated by water savings found on the western river systems. To meet those objectives, at corporatisation of Snowy Hydro the three Governments committed $375 million progressively through to June 2012 for the Joint Government Enterprise to achieve total targeted water savings of 282 GL, being 212 GL for the Snowy River and 70 GL for the River Murray.

7.9 Snowy Scientific Committee

The Snowy Scientific Committee is established by the Minister administering the Snowy Hydro Corporatisation Act. It is composed of six members nominated by the NSW and Victorian governments including an independent scientist as chairperson.

The principal functions of the Snowy Scientific Committee are:

(1) to advise the Ministerial Corporation each year on the regime for the release of water for environmental reasons under the Snowy Water Licence.

(2) to advise the Ministerial Corporation from time to time on the adequacy of those releases and the programs for management and restoration of the catchments (and the Snowy River and other rivers and streams) receiving water from those releases, including the arrangements for consultation, monitoring and on-going research about those programs.

SNOWY SCHEME RELEASES, THE ELECTRICITY MARKET AND DOWNSTREAM WATER USE

8. SNOWY SCHEME WATER RELEASES

8.1 The Four Drivers to Snowy Scheme Water Releases

There are four drivers to Snowy Scheme water releases:

(1) **Regulatory**: to meet the water release requirements prescribed in the Snowy Water Licence;

(2) **Electricity Generation**: to generate electrical energy. Snowy Scheme generation is generally targeted to periods of peak electricity market demand;

(3) **Physical**: inflows and storage levels:

(a) Snowy Hydro manages its storages so as to minimise spill from its reservoirs because spill equates to a loss of resource;

(b) Snowy Hydro moves water from short term storages to long term storage in Lake Eucumbene to minimise forced generation; and

(4) **Operational Constraints**: physical constraints in the Snowy Scheme such as tunnel diversion capacities.

It is important to note that electricity generation is inseparably linked to Snowy Scheme water releases because the only practical way to release water from the Snowy Scheme is by generating electricity through the Snowy Scheme's turbines.

8.2 The Snowy Scheme and the Electricity Market

The Snowy Scheme provides peak electricity and reserve products to the NEM. With the exception of some environmental flows and evaporation, all of the water collected, diverted and stored in the Snowy Scheme is used to drive Snowy Hydro's turbines and in practical terms water can only be released from the Snowy Scheme when Snowy Hydro generates electricity for dispatch into the NEM.

Snowy Hydro is a registered generator in the NEM and is therefore subject to the National Electricity Rules and Law. Snowy Hydro aims to sell its electricity into the NEM spot market in periods of high demand when demand for electricity within the NEM is not fully met by other base load generators. High demand for electricity usually occurs between 7am and 7pm of a weekday and during extreme weather fluctuations, such as during hot summer days when the use of air conditioners is high.

The Snowy Scheme's fast start electricity generation assets also allow Snowy Hydro to provide reserve products (e.g. voltage support, frequency control and system restart products) to the NEM and to therefore assist in maintaining the security of the interconnected power system and the quality of electricity supplied through it.

Although over a Water Year the Required Annual Releases and Quarterly Guaranteed Minimum Releases will be achieved; there will be some variability around Snowy Hydro's releases over the short term when NEM market events occur. Factors which govern the short term volume and timing of releases of water from the Snowy Scheme by Snowy Hydro include:

(1) the demand for electricity in the NEM;

(2) the spot price of electricity in the NEM; and

(3) Snowy Hydro's need to generate hydro-electricity to cover its position under various electricity risk management contracts with counterparts in the NEM.

Snowy Hydro cannot always predict NEM market events but will capitalise on such events whenever it is able to do so.

Virtually all of Snowy Hydro's annual revenues are derived from electricity market products and services.

8.3 Providing Flexibility for Downstream Water Users

Snowy Hydro does not earn any revenue from headworks or water supply charges. Since 2002 however, Snowy Hydro has received a small amount of revenue from agreements it has entered into with irrigators to make pre-releases of the following year's Required Annual Release in exchange for payment.

These agreements have been approved by the DWE (which is a party to them) and by the Murray- Darling Basin Commission in the case of arrangements affecting the Snowy-Murray Development. Approval is conditional upon satisfaction that the arrangements will not compromise the rights of other water users in the relevant catchments.

In the majority of the arrangements entered into the water is "repaid" to the Snowy Scheme by a reduction in the Required Annual Release from the relevant Development in following years. This reduction only takes place if water is available to irrigators, that is, when general irrigator allocation entitlements, as determined by the Minister of the DWE, rise above a certain percentage.

Also, under some of these arrangements, given the low levels of system storages and the benefit gained by irrigators in terms of earlier delivery of allocation water, DWE agreed that in certain Water Years Snowy Hydro could release up to 200 GL in excess of the current Water Year's RAR and have that excess accounted as a pre- release of the following year's RAR rather than have that excess accounted as a release of Above Target Water.

8.4 Downstream Re-Regulation of Snowy Scheme Releases

Snowy Scheme releases are not supplied directly to downstream water users. Rather, those releases and the other River Murray and Murrumbidgee River catchment inflows are re-regulated by the Hume Dam on the River Murray and Blowering Dam on the Tumut River.

Water releases for irrigation and environmental uses along the upper River Murray are managed by the MDBA principally through releases from Dartmouth and Hume Dams (the Snowy Scheme does not make releases into Dartmouth Dam), and by NSW State

Water along the Murrumbidgee River through releases from Blowering and Burrinjuck Dams (again the Snowy Scheme does not make releases into Burrinjuck Dam).

Irrigation releases are made:

(1) into the Murrumbidgee River catchment: from both Blowering Dam and Burrinjuck Dam. The operations of these dams are synchronised to meet irrigation demands; and

(2) into the River Murray: from both Dartmouth Dam and Hume Dam. Again, the operations of these dams are synchronised to meet irrigation demands.

ENVIRONMENTAL FLOWS AND OTHER RELEASES

9. ENVIRONMENTAL FLOWS

9.1 The Governments' Commitments to Environmental Flows

At the corporatisation of Snowy Hydro, the three Governments committed to funding and securing water efficiency savings on the Western Rivers to be used to provide environmental flows to the Snowy River below Jindabyne Dam, to the River Murray and to montane rivers within the Snowy catchment area.

The details of the Governments' commitments in relation to environmental flows are set out, in legally binding form, in the SWIOID. In terms of environmental flows objectives, the Governments summarised those objectives in the table below which is extracted from the SWIOID:

TIMING	INCREASED FLOW	TARGET VOLUME
STAGE ONE		
During the 12 Months from the Corporatisation Date until the first anniversary of the Corporatisation Date	Snowy River Increased Flows from either or both of the Mowamba River and Cobbon Creek	Target flow up to maximum of 38 GL per Water Year.
STAGE TWO		
During the period from the first anniversary of the Corporatisation Date until the seventh anniversary of the Corporatisation Date	Snowy River Increased Flows including, up until the third anniversary of the Corporatisation Date, a target flow up to a maximum of 38 GL per Water Year from either or both of the Mowamba River and Cobbon Creek	Target average annual flow of 142 GL per Water Year.
	Snowy Montane Rivers Increased Flows	Target average annual flow up to maximum volume equivalent to 100 GWh per annum of forgone electricity generation.
	River Murray Increased Flows	Target allocation of 70 GL per Water Year.
STAGE THREE		
From the seventh anniversary of the Corporatisation Date until the tenth anniversary of the Corporatisation Date	Snowy River Increased Flows	Target average annual flow of 212 GL per Water Year.
	Snowy Montane Rivers Increased Flows	Target average annual flow up to maximum volume equivalent to 150 GWh per annum of forgone electricity generation.
	River Murray Increased Flows	Target allocation of 70 GL per Water Year.

TIMING	INCREASED FLOW	TARGET VOLUME
STAGE FOUR		
From the tenth anniversary of the Corporatisation Date	Snowy River Increased Flows	Target average annual flow: (a) of 212 GL per Water Year; or (b) if applicable under **clause 5** of **Annexure One**, from 212 GL up to 294 GL per Water Year
	Snowy Montane Rivers Increased Flows	Target average annual flow up to maximum volume equivalent to 150 GWh per annum of forgone electricity generation.
	River Murray Increased Flows	Target allocation of: (a) 70 GL per Water Year; or (b) more than 70 GL per Water Year if agreed between the parties.

9.2 Environmental Flows and Snowy Hydro

Snowy Hydro has no role or involvement in the securing of water efficiency savings, in the allocation of those water efficiency savings between Snowy River Increased Flows or River Murray Environmental Flows, the calculation of Montane Rivers Environmental Flows and the timing of releases of environmental flows. All of these volumes, and the timing of release of these volumes, are notified by DWE to Snowy Hydro each water year. Snowy Hydro's only role is to target release of the volumes nominated by DWE and at the timing notified by DWE.

Snowy Hydro's only role is to provide the physical infrastructure to enable environmental flows to be made and to operate those works to target releases as defined in the Snowy Water Licence and each AWOP.

Set out below is a table that identifies the entities who are responsible for the various actions required to implement the water regulatory arrangements set out in the SWIOID, the NSW Corporatisation Act, the Water Management Act, the MDB Agreement, and the Snowy Water Licence with respect to environmental flows from the Snowy Scheme:

ACTION REQUIRED	WHO IS RESPONSIBLE
Securing verified water savings from water savings projects on the River Murray or Murrumbidgee River (or purchase of water entitlements).	Water for Rivers
Transferring verified water savings into Environmental Entitlements.	NSW (DWE) and Victoria (DSE)
Calculating annual allocations from the Environmental Entitlements each year (in arrears).	NSW (DWE) and Victoria (DSE)
Apportioning the annual allocations between the Snowy River Increased Flows, River Murray Increased Flows and the Mowamba Borrow.	NSW (DWE)
Determining and then notifying Snowy Hydro of annual, monthly and daily release volumes for Snowy River Increased Flows.	NSW (DWE)
Providing infrastructure to enable Snowy River Increased Flows from Jindabyne Dam and modify existing infrastructure to enable Snowy Montane Rivers Increased Flows.	Snowy Hydro
Targeting releases of Snowy River Increased Flows from Jindabyne Dam.	Snowy Hydro

9.3 Government Funding for Water Efficiency Savings

Under the SWIOID, the Snowy River Increased Flows, the River Murray Increased Flows and repayments to the Mowamba Borrow are all to be offset by the annual allocations attaching to (nominal) water entitlements obtained by the Governments primarily through prior verified water efficiency savings in diversions from the River Murray and in the Murrumbidgee and Goulburn-Murray river systems.

In simple terms those (nominal) water entitlements will reduce the volume of water required to supply the needs of downstream entitlement holders on the Murray and Murrumbidgee river systems. Therefore, the volume of the Required Annual Releases can be reduced each year by the volume of the annual allocations attaching to (nominal) water entitlements without prejudicing the security of downstream users' entitlements. That water is then available for use as environmental flows.

To achieve these water efficiency savings, the three Governments established the Joint Government Enterprise (trading as "Water for Rivers") with a charter to obtain water efficiency savings at least cost.

On the corporatisation of the Snowy Scheme, New South Wales and Victoria each committed $150 million and the Commonwealth $75 million, over 10 years (2002 - 2012) to achieve the water efficiency savings. The Commonwealth has since committed a

further $50 million in 2008.

The Snowy Scientific Committee, established by the Minister administering the NSW Corporatisation Act, is to advise the Ministerial Corporation each year on the regime for the release of water for environmental reasons under the Snowy Water Licence.

9.4 The Key Element of the Environmental Flow Regime: the 1:1 Ratio

The key element of the environmental flow regime established under the SWIOID is that the total volume of environmental flows each year (Snowy River Increased Flows, River Murray Increased Flows and repayments to the Mowamba Borrow) must not be greater than the volume of the annual allocations attaching to the water efficiency savings entitlements achieved by the Governments to date.

Therefore the SWIOID prescribes that environmental flows in a Water Year must be released on a 1:1 ratio with the annual allocations attaching to the water savings achieved by the Governments prior to that Water Year up to the target volume specified in the SWIOID. Any breach of this 1:1 ratio will, by definition, prejudice the security of downstream water users' rights (irrigators and the environment).

9.5 Environmental Entitlements and Annual Allocations

The SWIOID prescribes in some degree of detail the process that must be gone through each year to determine the volume of environmental flows to be made from the Snowy Scheme. The process can be summarised as follows.

Each Water Year:

(1) **Transfer of verified water savings to Environmental Entitlements**: the States of New South Wales and Victoria must transfer verified water savings and any water entitlements purchased by Water for Rivers achieved in that Water Year into the State's relevant Environmental Entitlement;

(2) **Apportionment of Environmental Entitlements**: the State of New South Wales must then apportion the water within each Environmental Entitlement between the Snowy River Apportioned Entitlement and the River Murray Apportioned Entitlement on a 2:1 basis; and

(3) **Determining the Annual Allocation**: the State of New South Wales must then determine the annual allocation attaching to each of the Snowy River Apportioned Entitlement and the River Murray Apportioned Entitlement according to the Seasonal Availability of water contained in each Entitlement.

9.6 Why the Required Snowy River Increased Flow Volume May Be Less than the Volume of the Nominal Environmental Entitlements

Verified water savings and the Environmental Entitlements are in the form of entitlements, not allocations. In other words, those volumes are purely nominal. They may comprise, for example, nominal amounts of NSW high security water, NSW general security water, NSW sales water, Victorian water rights or Victorian sales water.

The actual volume of Snowy River Increased Flow releases to be made by Snowy Hydro is based not on these nominal amounts but on the annual allocations attaching to those nominal entitlements. In simple terms, if during one Water Year the allocations made in

respect of the entitlements comprising the Environmental Entitlements were low (for example, due to drought), the allocation volume will be less than the entitlement volume. It is the (lower) allocation volume calculated by the Ministerial Corporation that is to be targeted for release by Snowy Hydro.

9.7 Snowy River Increased Flows Prior to the Third Anniversary of Corporatisation – the Mowamba Borrow

Under the *Snowy Water Licence*, Snowy Hydro was required to make Snowy River Increased Flows from the Mowamba Weir only from the period from the Corporatisation Date until the third anniversary of the Corporatisation Date (28 June 2002 to 28 June 2005). This was a temporary arrangement until modifications were made to Jindabyne Dam to enable the release of Snowy River Increased Flows from Jindabyne Dam.

The releases made from Mowamba Weir during the first three years after Corporatisation Date were "borrowed" from the Snowy Scheme's Below Target Water and have to be repaid to the Snowy Scheme. That is, those environmental releases were not off-set by annual allocations attaching to verified water savings at the time of the release but, rather, are to be offset by future water savings as they are verified.

While there is a balance in the Mowamba Borrow account (that is, the Borrow is not repaid), the Snowy Scheme will run out of water earlier in a dry inflow sequence than it otherwise would have in terms of being able to maintain western river releases. This prejudices the security of downstream entitlements on the River Murray and Murrumbidgee Rivers.

9.8 Snowy River Increased Flows from the Third Anniversary of Corporatisation

Under the Snowy Water Licence, from the third anniversary of the Corporatisation Date (28 June 2005), Snowy Hydro has been required to make Snowy River Increased Flows only from Jindabyne Dam into the Snowy River (and not from Mowamba Weir).

To comply with this requirement, the temporary arrangement for the release of Snowy River Increased Flows from Mowamba River ceased in January 2006 when diversions from the Mowamba River to Jindabyne Dam recommenced.

The Snowy Scientific Committee, established by the Minister administering the NSW Corporatisation Act, is to advise the Ministerial Corporation each year on the regime for the release of water for environmental reasons under the Snowy Water Licence.

9.9 Environmental Flows – Snowy River

Under the Snowy Water Licence, Snowy Hydro is required to make two types of environmental flows.

The first is known as Snowy River Increased Flows. These are releases to be made from Jindabyne Dam into the Snowy River.

The volume of the Snowy River Increased Flows to be made each year by Snowy Hydro is determined by the volume of verified water savings achieved and water entitlements purchased to that date by the Governments from the River Murray and Murrumbidgee Rivers.

Note in this regard that, generally, water efficiency savings are allocated to the Snowy

River Increased Flows and the River Murray environmental flows in the proportion 2:1. That is, for every 3 GL of water efficiency savings achieved by the Governments, 2 GL is allocated to the Snowy River and 1 GL is allocated to the River Murray.

The main exception to this general rule is that the Snowy River allocation is then to be split 1:1 between Snowy River Increased Flows to be made from Jindabyne Dam and to repayment of the Mowamba "borrow" which currently stands at about 62 GL. The releases made from Mowamba Weir during the first three years after the Corporatisation Date were "borrowed" from the Snowy Scheme's Below Target Water and have to be repaid to the Snowy Scheme. That is, those environmental releases were not off-set by verified water savings at the time of the releases but, rather, are to be offset by future water savings as they are verified. If the borrow is not repaid, the Snowy Scheme will run out of water earlier in a dry inflow sequence than it otherwise would have in terms of being able to maintain western river releases.

9.10 Environmental Flows – Snowy Montane Rivers

The second is known as Snowy Montane Rivers Increased Flows. These are additional flows that Snowy Hydro must allow to pass through or over certain of its regulating structures.

The volume of Snowy Montane Rivers Increased Flows increases proportionately with the volume of Snowy River Increased Flows. Under the Snowy Water Licence (which in this regard mirrors the SWIOID) the volume of Snowy Montane Rivers Increased Flows is capped at 150GWh of foregone electricity generation.

10. OTHER RELEASES

10.1 Introduction

In addition to the Required Annual Releases and Environmental Flows, a number of other releases are made from various Scheme Storages.

10.2 Base Passing Flows

Base passing flows, defined in the Snowy Water Licence, are releases made from Jindabyne Dam to the Snowy River and from Tantangara Dam to the Upper Murrumbidgee River in addition to any riparian or increased flow release requirements. They are made from Below Target Water and shared equally between the Developments.

The Snowy River base passing flow is 9 GL per year and in the Upper Murrumbidgee River the base passing flow is to be a long term average of 2 GL per year.

10.3 Riparian Releases

The Snowy Water Licence was intended to codify Snowy Hydro's water release obligations on and from the Corporatisation Date.

The Snowy Water Licence does not, however, refer to the three riparian releases made from the Snowy Scheme. In the paragraphs below those riparian releases are defined and their accounting treatment is described. Snowy Hydro has no other riparian release obligations.

(1) **Upper Murrumbidgee River**

Tantangara riparian releases up to the lesser of 83 ML/day or the inflow into Tantangara Reservoir are made to as far as practicable maintain the flow of the Murrumbidgee River at Mittagang Crossing at 32 ML/day.

In a letter of 3 December 1984 by the Water Resources Commission of NSW, now DWE, restrictive flow conditions were formulated to prohibit irrigation from the river unless flow is sufficient to satisfy flow requirements at Mittagang Crossing and other nominated locations downstream to Burrinjuck Storage.

The riparian release is accounted as Tantangara Base Passing Flow.

(2) **Mowamba River**

Riparian releases of approximately 1.2 ML/day equivalent to 0.4 per annum are made continuously from the Mowamba Weir and accounted as Jindabyne Base Passing Flow.

(3) **Eucumbene River**

Riparian releases of up to 2.4 ML/day are made from Eucumbene Dam to maintain visible flow in the Eucumbene River at Nimmo, about 7 kilometres downstream of Eucumbene Dam.

WATER ACCOUNTS FOR THE 2007-08 WATER YEAR

11. DETAILED WATER ACCOUNTS FOR THE 2007-08 WATER YEAR

11.1 Annexures to this Water Operations Reference Report

Annexed to this Water Operations Reference Report are:

(1) **Annexure One: the Water Balance for the 2007-08 Water Year**. This table sets out the start storage, inflows, releases and the closing storage for the Developments for the 2007-08 Water Year; and

(2) **Annexure Two: calculation of the RAR for the 2007-08 Water Year**. This table provides a detailed breakdown of the calculation of the RAR in accordance with the formulae set out in the Snowy Water Licence for the 2007-08 Water Year.

ANNEXURE ONE: WATER BALANCE FOR THE 2007/08 WATER YEAR (GL)

	SNOWY-TUMUT	SNOWY-MURRAY
Storage at 1-5-2007	206	211
Inflows from 1-5-2007 to 30-4-2008 (Snowy-Tumut inflows include only Upper Tumut inflows. Lower Tumut Inflows are accounted through the net change in storage at Ta bingo/Jounama during the year – see below)	739	847
Turbined Release (Turbined releases are accounted at Tumut1 & Murray1 power stations)	-577	-725
Aqueduct Losses (Water that would have passed through T1 and M1 power stations but does not for operational reasons such as maintenance outages is accounted as a release)	0	-2
The Snowy-Tumut Development Annual Allocation Transferred to the Snowy – Murray Development	-31	31
Snowy River Increased Flows	N/A	-32
Snowy Montane Rivers Increased Flows	-17	0
Inter-valley transfers Snowy- Tumut Development to Snowy-Murray Development	0	0
Inter-valley transfers Snowy- Murray Development to Snowy-Tumut Development	0	0
Notional Spill Snowy- Tumut Development to Snowy- Murray Development	0	0
Notional Spill Snowy- Murray Development to Snowy- Tumut Development	0	0
Tantangara Base Passing Flow	0	0
½ Jindabyne Base Passing Flow (total 9 GL split equally)	-5	-5
½ Mowamba Payback	0	0
Blowering Pre-release Compensation Release	0	0
Net Evaporation from 1-5-2007 to 30-4-2008	-13	-20
Talbingo/Jounama Storage Change (Equates to Lower Tumut inflows of 102 of which 91 was passed)	11	N/A
Storage at 30 April 2008	**312^**	**305**

^ Rounding correction

ANNEXURE TWO: CALCULATION OF REQUIRED ANNUAL RELEASE FOR 2007-08 (GL)

	SNOWY-TUMUT	SNOWY-MURRAY
REQUIRED ANNUAL RELEASE FOR THE 2007- 2008 WATER YEAR		
Annual Calculated Yield for the Development	1026	1062
PLUS: DISV as at 1st March 2007 from 2006-07 Water Year	0	151
LESS: Releases in Excess of Required Annual Releases up to DISV	0	151
LESS: reduction in 2007-08 Required Annual Release to repay Above Target Water released under Water Deals:	0	0
LESS: Snowy-Murray Development Annual Allocation/ Snowy-Tumut Development Annual Allocation	31	18
Calculated Required Annual Release for 2007-08	995	1044
LESS: Releases made in 2006-07 Water Year above Required Annual Releases but accounted as pre-release of 2007-08 Required Annual Release under Flexibility Provisions	187	66
1 May 2007 Required Annual Release deliverable in 2007-08	**808**	**978**
Less 1 March 2008 DISV	276	383
Less Water Deals Payback	85	0
Final 2007-08 RAR	**447**	**595**