

Submission  
No 59

## INQUIRY INTO WATER AUGMENTATION

**Organisation:** Sydney University Speleological Society  
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## **Sydney University Speleological Society Submission to the Upper House Inquiry into Water Augmentation in NSW**

This submission is put forward on behalf of the Sydney University Speleological Society (SUSS). SUSS is the oldest caving club on mainland Australia, established in 1948, and we engage in cave surveying, scientific research, recreational caving, and karst conservation. Our aims are to foster speleology as a science and a recreational activity; to encourage the preservation of natural wilderness areas and in particular natural subterranean areas and the karst heritage of Australia; and to cooperate with other bodies in the furtherance of these aims.

In accordance with this, SUSS is concerned with the proposed dam on the Belubula River in Central West NSW, specifically focusing on sections 1.b and 1.f of the Terms of Reference. A dam here is by no means a sustainable, practical or superior choice for water augmentation. Both options for the dam site (Cranky Rock and Needles Gap) would have a severe impact on the environmental, geological and cultural heritage values of the Belubula River Valley, and in particular the Cliefden Caves Area.

The Cliefden Caves Area is located on the Belubula River, southwest of the City of Orange. SUSS began surveying the cave systems in 1973. This work continues, with SUSS presence at Cliefden now almost monthly. A significant part of this effort stems from the urgent need to understand and appreciate the extent and value of these systems before they may be flooded.

Early survey results indicate that any dam on the Belubula River that floods above approximately 380 metres above sea level will flood Cliefden Caves. Both the proposed dam options would well exceed this height, and the water level at Needles Gap would be raised by up to 50 metres.

The Cliefden Caves Limestone was the first discovered in mainland Australia in 1815. There are over 100 recorded caves and geological features at Cliefden in near pristine condition due to controlled access to the site. The cave systems are up to 3km long and contain key records of past environments in cave sediment deposits, which are largely unstudied. The significance of the geological heritage, scientific importance, and – not least – the intrinsic value and beauty of Cliefden Caves cannot be overstated.

The Cliefden Caves Area has previously been recognised as having national significance, with it being listed on the Register of the National Estate until its closure in 2007. The area is the most significant cave system outside of a National Park in New South Wales, is listed on the National Trust Register, and is considered by the National Parks and Wildlife Service (NPWS) as one of the highest priority areas to

acquire. The caves contain the full range of decorative cave formations, including rare blue stalactites, stalagmites, helictites and columns. The quality of these has been compared to NSW's Jenolan Caves, which are Australia's most visited and renowned internationally as part of a UNESCO World Heritage Site. The caves are also a significant habitat for several species of microbat, including species protected by the NSW Threatened Species Conservation Act, 1995.

While the caves are located close to the Belubula River, there is no evidence that the river has ever flowed through them, and they are instead likely to have formed by groundwater solution. Flooding the caves would irreversibly damage and degrade everything that makes them so special.

The environment of the Belubula River Valley above the caves is equally precious and too must be preserved.

450 million year-old invertebrate fossils are found at Cliefden, and more than 60 scientific papers have been published in peer-reviewed Australian and international journals documenting 191 genera and 263 species. Of these fossil species, 45 genera and 101 species are unique to the area threatened by flooding. The fossil deposits at Cliefden are used as an international paleontological reference site. Flooding the area would permanently alter and destroy the fragile fossil deposits and prohibit future research on them.

A thermal spring is located on the Belubula River adjacent to the caves. Only three such springs (rising from Paleozoic rock as opposed to those from the Australian Basin), have been documented in NSW.

Native fish and platypus also inhabit the river in the proposed area of inundation, and tributaries to the Belubula are known to have a high diversity of macroinvertebrate species compared to that of other watercourses. The Belubula River is a tributary to the Lachlan River system, and the wetlands at the end of the Lachlan River are protected by commitments from the Australian Government under international migratory bird agreements.

The Belubula River is already dammed at a number of locations upstream of Cranky Rock including at Carcoar Dam, Lake Rowlands and at the Cadia Valley Mine operations. The Millennium Drought saw the Belubula run dry, with the entire Lachlan system running out of water. An additional dam will reduce downstream flows, negatively effecting the ecology of both the Belubula River, and wetlands of the Lachlan River System. Further to this, the reduction of water for downstream users will lead to social and economic impacts, and, if private enterprise is the beneficiary of the water (as put forward in the Federal Government's Water Infrastructure Ministerial Working Group paper in 2014), it would likely increase water prices for local water uses.

Another dam will not be able to provide the water augmentation benefits to outweigh the damage that it will cause. The proposed dam would only increase inefficiencies in water management that are a loss to all users, as the storage reservoir created would be shallow, with a high surface area and high evaporation rates. Further to this, the proposed dam sites have been rejected twice before, in the 1940s and in the 1970s, as being geologically unsuitable. NSW needs innovative, well-considered, sustainable approaches to water management in the face of changing climatic conditions and the need to promote economic growth, protect our environmental heritage and support both increasing urbanisation and agricultural intensification. The proposed dam will fulfil none of this, and only add to the unnecessary degradation that has been caused in the past by tunnel-vision approaches.

Clear alternatives to water augmentation in Central NSW exist, including urban stormwater harvesting, managed aquifer recharge, non-potable water recycling and direct potable reuse, together with re-evaluation of water demand and the continued increase in implementing more sustainable water use practices.

SUSS submits in the strongest terms that the Inquiry reject the proposal for any future dam on the Belubula River, and that it examines other, more sustainable water management options that will bring both environmental as well as social and economic benefits (which should be mutually reinforcing, rather than mutually exclusive). The heritage values of the Cliefden Caves Area and Belubula River Valley outweigh the need for any dam proposal that would compromised their protection.

Thank you very much for your time and consideration.