

Battle4Berrima

“Our fight is for the whole Southern Highlands”

Battle For Berrima Inc. Submission – Expert Water Panel

13 November 2018

Office of the NSW Chief Scientist & Engineer
GPO Box 5477
SYDNEY NSW 2001

Re: Submission to the Independent Expert Panel for Mining in the Catchment

We thank you for the opportunity to make a submission on behalf of our members and the community of the Southern Highlands of NSW and Greater Sydney Water Catchment.

1: Introduction

Battle for Berrima is a politically non-aligned community organisation established following the announcement by Korean owned Hume Coal of its plans for the Southern Highlands' first ever mega underground coal mine.

If approved, this will be the first new coal mine granted authority to operate in the Greater Sydney Water Catchment in decades.

Our aim is to protect both the Southern Highlands and our shared water catchment from the unacceptable and proven risks to our water, air, environment, flora & fauna from coal mining activity.

We aim to empower residents, families, businesses and local communities across the Southern Highlands to ensure that their voices are heard using democratic means.

2: Terms of Reference, Expert Panel

We note that the Terms of Reference for the Expert panel is limited to examining the impacts of coal mining within the Special Catchment Areas.

This is despite the well-documented damage of both past and present coal mining activities within the Greater Sydney Drinking Water Catchment and which have potentially significant impacts on the Special Catchment areas as well as Catchment storages including Warragamba.

Of most significant relevance here is the ongoing pollution event at the Boral owned Berrima Colliery at Medway. This heavy metal contamination of The Wingecarribee Rover

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has been the subject of extensive academic research and inquiry that has been widely reported.

In summary millions of litres of contaminated mine discharge – containing high levels of zinc, manganese, nickel, iron and other heavy metals - has been pumped directly into the Wingecarribee River which is the emergency transfer route in periods of drought for water being pumped back into the Warragamba Dam storage from the Shoalhaven’s Tallowa Dam.

The proposition – inherent in the Panel’s Terms of Reference - that coal mining activities can be assessed in isolation within the Special Catchment Area without consideration of the impact of activities in the Greater Sydney Catchment Area where drinking water is passing through a known contamination site – is frankly insupportable.

More broadly, the Terms of Reference do provide the Panel the opportunity to consider the matters raised in this submission within the parameters of 2(d) which states:

2(d) In delivering its report, the Panel will provide comment on and make observations or recommendations about any information or factors the Panel believes relevant, including requirements to strengthen monitoring networks or undertaking further scientific research.

2 (d) speaks directly to the capacity of the Panel to consider “any information or factors the Panel believes relevant” and on any reasonable interpretation should include coal mining activities past and present within the Greater Sydney Water Catchment.

3: Boral Colliery, Berrima

The Boral owned Berrima Colliery is located on the Wingecarribee River at Medway, within the Greater Sydney Drinking Water Catchment.

In 2017 the extent of damage to the Wingecarribee River caused by the uncontrolled heavy metal contaminated pollution discharge.

Dr Ian Wright at the University of Western Sydney is an independent expert on coal mine closures and has undertaken work on a number of sites across the Greater Sydney Drinking Water Catchments.

His research at the Boral Berrima Colliery at Medway found the mine, in care and maintenance mode, was discharging 30 litres a second of heavy metal contaminated water directly into the Wingecarribee River.

This is the equivalent to an Olympic Swimming Pool a day. Dr Wright considered that the polluted discharge accounted for 50% of the River’s flow given the dry conditions.

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The Wingecarribee River is in the Catchment and water from it ends up in Warragamba Dam that supplies Sydney’s drinking water. It is also the emergency transfer route of water from the Tallowa Dam to the Warragamba Storage in times of drought.

Dr Wright’s report on water discharged from the mine was provided to the EPA and Boral in August 2017.

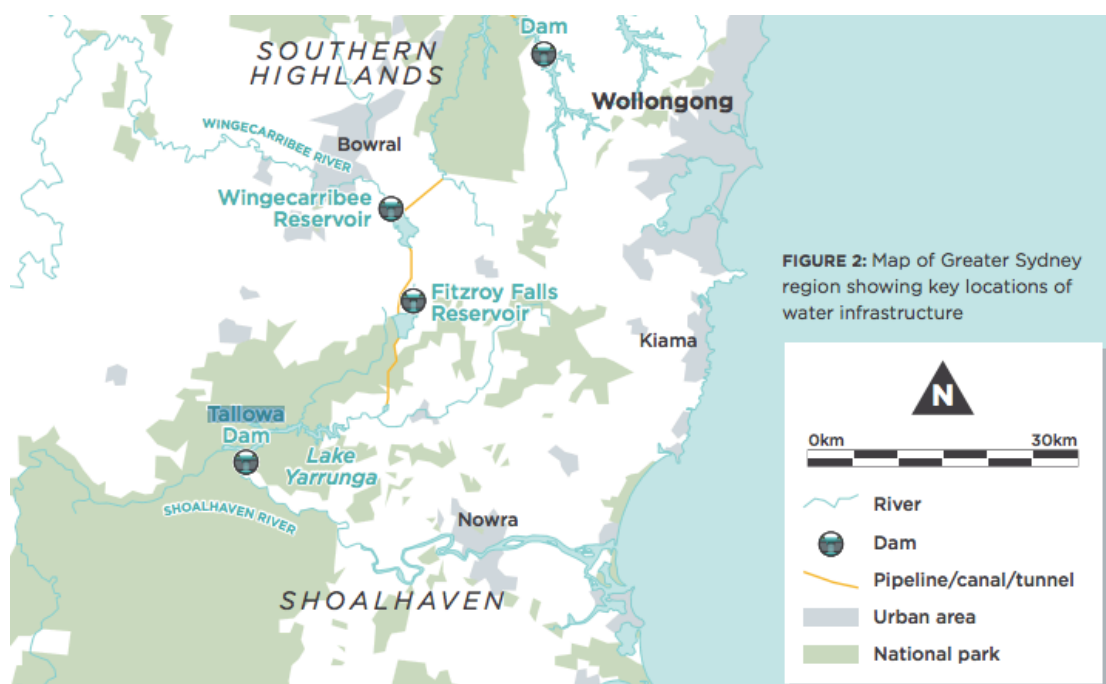
The Community was not told about the pollution from the Boral Mine until Dr Wright’s report was subject of media reporting in August 2017.

Dr Wright found heavy metal contaminated water flowing directly into the River with levels of manganese, iron, nickel and zinc above permitted levels. He found zinc at 120 times baseline level.

He described the pollution from the Boral Medway Colliery as ‘internationally significant’ and:

- ***"I've been studying coal mines and water pollution associated with coalmines for nearly 20 years in the Sydney basin.***
- ***"This is the worst. And it's counterintuitive, to many, to me indeed, that the mines shut down and the pollution has got worse. Dr Wright said the contamination was "internationally significant".***

4: Tallowa Dam Transfers to Warragamba



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The 2017 Metropolitan Water Plan describes the role of the Tallowa Dam and the critical importance of water transfers into the Warragamba Storage in times of drought as currently being experienced.

“Tallowa Dam stores inflows from the Shoalhaven River, which can be transferred to Warragamba Dam via the Wingecarribee River or to Nepean Dam when needed to boost supplies to both Sydney and the Illawarra. The Shoalhaven system has operated since the 1970s and can provide a significant portion of supply when storage levels in the Warragamba and Upper Nepean dams are declining.

And:

SUPPLEMENTING DRINKING WATER SUPPLIES WITH ADDITIONAL TRANSFERS FROM THE TALLOWA DAM ON THE SHOALHAVEN RIVER

Sourcing water from Tallowa Dam on the Shoalhaven River is critical to maintaining water supplies to Greater Sydney. Shoalhaven pumping begins when dam storages drop to 75 per cent of total dam storages but the drawdown level of Tallowa Dam is limited to one metre below the full supply level to avoid negative impacts on recreational use of the river, storage and the local economy. During an extreme drought, and in line with existing agreements, we are able to lower the level in Tallowa Dam to three metres below the full storage, which provides additional water to top up the region's water supplies.

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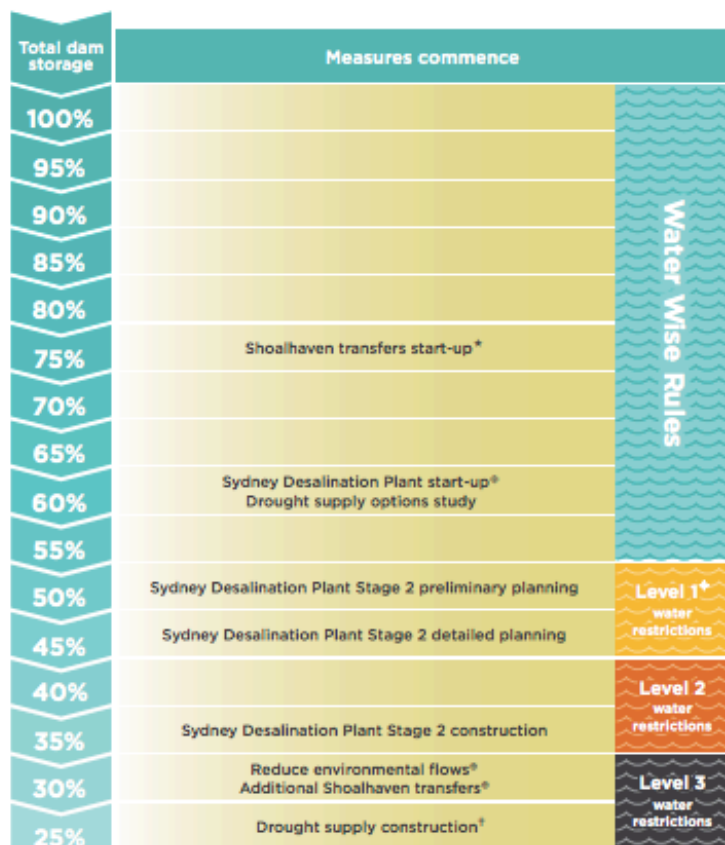
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2017 Metropolitan Water Plan portfolio of measures



- * Shoalhaven transfers turned off when dam storage levels reach 80%.
- ⊕ Sydney Desalination Plant operates in a certain way in its drought response role: when total dam storage levels fall below 60% ('on' trigger) Sydney Desalination Plant Pty Ltd must operate to maximise its supply of drinking water to Sydney Water's area of operations. Outside the 'minimum run time', these arrangements will continue to apply until total dam storages reach 70% ('off' trigger).
- ⚡ Water restrictions eased as dam levels rise, based on circumstances at the time.
- ⊖ Off trigger linked to the easing of Level 3 water restrictions.
- ‡ Dependent on the outcomes of the drought supply options study, some drought supply options may need to be introduced earlier.

FIGURE 5: Sequencing of measures and triggers for the 2017 Metropolitan Water Plan portfolio

5: Tahmoor Colliery & Redbank Creek

Dr Ian Wright from the University of Western Sydney has undertaken significant research and independent study into the impacts of coal mining, including longwall coal mining, within important water catchment systems.

In a 2015 published paper¹ Dr Wright detailed findings of research undertaken at Redbank Creek, located above longwall coal mining undertaken by the Tahmoor Colliery.

¹ Subsidence from an Underground Coal Mine and Mine Wastewater Discharge Causing Water Pollution and Degradation of Aquatic Ecosystems Ian A. Wright & Blake McCarthy & Nakia Belmer & Philip Price

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The damage caused to Redbank Creek is well documented and has been reported on widely including this report on the ABC and the NSW Government requiring the mine operator to repair the damage to the creek. It is unclear how repair of the Redbank Creek is expected to be achieved.²

The Abstract of Dr Wright’s paper details the study undertaken and the impacts of the Tahmoor Colliery on the waterways and water quality.

This study examined a single underground coal mine and investigated two aspects of its operation: the disposal of the mine waste through a discharge to a nearby river and the impact of subsidence from an underground longwall to a small waterway above.

Water quality of the two waterways was monitored over a 2-year period with a monthly investigation over a 6-month period, which included collection of stream macroinvertebrates.

Both mine activities modified surface water geochemistry and macroinvertebrate communities. Mean electrical conductivity (EC) increased in surface waters below the mine discharge, rising 4.8 times from (186 $\mu\text{S}/\text{cm}$) upstream to 1078 $\mu\text{S}/\text{cm}$ below the waste inflow. Mean EC increased in a small stream that was disturbed by subsidence from longwall mining, rising 3.8 times from (247 $\mu\text{S}/\text{cm}$) upstream to 1195 $\mu\text{S}/\text{cm}$ below. The mineral constituents of the increased salinities were different.

The coal mine wastewater discharge was enriched with sodium and bicarbonate ions compared to sodium and chloride ions in the subsidence affected creek. Both the waste discharge and the subsidence caused increases in the concentrations of zinc by about four times and nickel by 20 to 30 times the background levels.

The subsidence reduced dissolved oxygen to ecologically stressful levels and increased iron and manganese concentrations by about 20 times the background levels. Two of the key changes in stream ecosystems were a reduction in the proportion of mayfly larvae downstream of the mine waste discharge and mosquito larvae dominating (60–70 % of total abundance) the invertebrate community in the subsidence affected creek.

A further paper³ (Morrison et al. The effects of underground coal mining on stream water quality) detailed a 5-year investigation into coal mining and subsidence, channel fracturing and water pollution in the same Redbank Creek area.

2

<https://www.abc.net.au/news/2018-09-17/sydney-coal-mine-ordered-to-repair-cracked-creek/10253148>

³ Underground coal mining and subsidence, channel fracturing and water pollution: a five-year investigation Morrison KG 1, Reynolds JK 1 and Wright IA1

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The investigation found:

- *Underground coal mining triggered subsidence and severe fracturing of bedrock stream channels.*
- *Flow was lost in some fractured sections and was gained from upwelling groundwater in others.*
- *Subsidence fracturing was clearly linked to major changes in stream water quality.*
- *Salinity increased in fractured sections from c. 250 $\mu\text{S}/\text{cm}$ (upstream) to 400 – 1800 $\mu\text{S}/\text{cm}$.*
- *Metal concentrations (iron, manganese, zinc, nickel, strontium, barium and lithium) in the fractured zone increased sharply.*
- *Zinc and nickel were often at concentrations hazardous to aquatic ecosystems.*
- *Very low dissolved oxygen was often associated with upwelling groundwater that emerged through stream channel fractures.*
- *Mosquitos were the most abundant macroinvertebrate at two subsidence-affected sites.*
- *Future rehabilitation of the fractured waterway channel will be very challenging.*

6: An overview of other coal mining impacts on the catchment

The impact of other coal mining activities within the Greater Sydney Drinking water Catchment is well documented by organisations including Lock The Gate and includes:

APPIN COAL MINE

Flammable methane leaking through Nepean River due to riverbed cracks caused by nearby longwall coal mining.

<https://youtu.be/367ukCsMLAk>

METROPOLITAN COAL (PEABODY) MINE

Undermining Woronora Catchment

The once pristine waterway, Waratah Rivulet, in the Woronora Catchment Special Area which flows into Woronora Dam, was cracked and drained by mining in 2006.

https://youtu.be/6NSe_5sO1LA

RUSSELL VALE COAL MINE

Undermining Cataract Catchment

WaterNSW was scathing about Wollongong Coal’s Russell Vale expansion plan: “The estimated water loss of 7.3 million litres per day is unacceptable, particularly during dry periods.”

<https://youtu.be/QhsYOUPDyOk>

DENDROBRIUM COAL MINE

Undermining Cordeaux Catchment

Sept 2016 catchment inspection revealed newly cracked and drained creeks and dry wetlands. WaterNSW objected to a proposal lodged by Illawarra Coal, saying the risks to

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the Sydney water supply are “unacceptably high.” Recently, Professor Jim Galvin has warned of “potential permanent consequences for the Sydney Drinking Water Catchment Metropolitan Special Area.” A Department of Planning report has revealed that precious rainfall that should be feeding Sydney's dams and drinking water supply is being drawn into polluted mining voids underground.

<https://youtu.be/T445QvnS3oI>

SPRINGVALE COAL MINE

Millions of litres of highly saline mine water containing nitrates, phosphates, zinc, nickel and other contaminants is discharged every day into the Coxs River, which flows into Sydney's largest water supply, Warragamba Dam.

Unpublished research by Dr Ian Wright and PhD student Nakia Belmer has revealed that the disposal of Springvale Coal Mine wastes into two tributaries of the Coxs River (Sawyers Swamp Ck and Springvale Ck) that received mine waste water had highly elevated salinity (approximately 15 to 31 times higher) than the back ground (upstream/reference levels which varied from 35.7 to 53.6 $\mu\text{S}/\text{cm}$). The salinity below the mine discharges was 840.2 to 1162 $\mu\text{S}/\text{cm}$ which was 2.4 to 3.3 times above the Sydney Drinking Water catchment river Guidelines and ANZECC (2000) ecosystem guidelines. The discharge of Springvale wastewater contributes to the degradation of water quality in Lake Burragorang (as identified by the 2016 Catchment Audit – Volume 2 and Volume 3) as all of its 9 sampling sites had elevated salinity, and of additional concern, the rising salinity trend was worsening over 3 years and 20 years at all sites.

7: Other issues for consideration

Setting aside our fundamental and unequivocal position that no coal mining activities should be conducted within the Greater Sydney Drinking Water Catchment, we make the following points in respect of the current situation including the poor regulation and monitoring of existing coal mines as well as the inherent conflicts between government agencies whose sole role is to increase financial returns to the state in contrast with those agencies tasked with protecting our precious water resources.

These points include:

- 1. Lax environmental regulation of coal mine activities contributes to water pollution.*
- 2. The NSW planning system has a key role in approving coal mines that pollute*
- 3. NSW treasury appreciates the massive royalties from coal mining (\$1 billion plus)*
- 4. Key NSW Government agencies keep changing names, functions and this*
- 5. contributes to inadequate protection of our drinking water.*
- 6. Governance of water in the Drinking Water catchments is complex, confusing and needs to be improved*
- 7. Sydney's drinking water is lucrative. In 2016-17 Sydney Water had \$2.8 billion revenue and made \$340 million after tax profit.*

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8. *Water quality monitoring of catchment rivers has many gaps and is poorly shared with the community. It is currently impossible to ‘track’ the pollution impact of coal mines (and other pollution sources – like sewage).*

Michael Verberkt
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