Background

NSW is currently experiencing one of the worst droughts on record. Boggabri has experienced its lowest consecutive rainfall over the past three years since at least 1900 (Figure 1). Accompanying reduced rainfall, are increased temperatures and increased pan evaporation. As a consequence of climate change droughts are likely to become more frequent and more intense.

The EIS for the Vickery Coal Mine Extension has failed to consider these conditions when forecasting the water requirements for the Mine and CHPP. They appear to have made the incorrect assumption that since the average AWD (Available Water Determinations) for general security Namoi River entitlements is 76%, they will have 76% of their entitlement every year. There are no provisions for zero allocations coinciding with low rainfall capture.

The modellers for the Vickery Extension Water Budget have also inexplicably used the Mt Lindesay weather station in the Nandewar Ranges for rainfall data (See pg 28 on following link).

https://majorprojects.accelo.com/public/4c7416e1051db63aa17b92c6abdd430a/22.%20Appendix%20B_%20Surface%20Water%20Assessment.pdf

Mt Lindesay is over 50km away, sits at 1373 meters above sea level (compared to 250m at Boggabri), and has nearly double the average rainfall of Boggabri.

Maules Creek and Tarrawonga Coal mines have been scrambling for water recently, with the purchase of new properties and water rights, haulage of water by road trains and rushed installation of pipelines to deliver inter-zone transfer of groundwater. This is despite Maules Creek Coal Mine holding a high security entitlement on the Namoi river of some 3000ML in comparison to Vickery's 50ML, and at least 824ML of Upper Namoi Alluvial groundwater allocation compared to Vickery's 396ML (much of which has been transferred to Maules Ck for the past two water years).

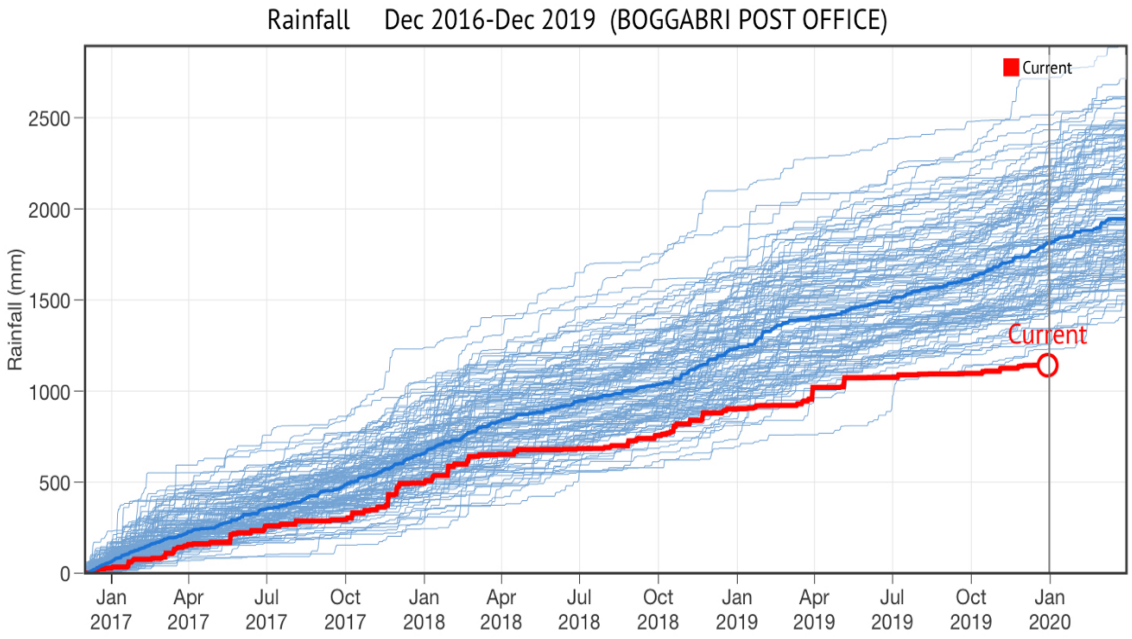

Figure 1. Cumulative rainfall for Boggabri Post Office over a 36 month period since 1900. Source Australian CliMate app.

WHC have allocated 2145ML of groundwater and river licences to this project, (figure 2), of which only 396ML would be available in the 2019-20 water year, as there is zero allocation on the Namoi river. Of this 236ML has been traded to Maules Creek Coal Mine this year to keep up production there, leaving just 160ML for Vickery (figure 3).

WAL No	Works Approval	Groundwater/River	Allocation (Shares)
WAL 12645	90CA806830, 90CA806981, 90WA9807004	Groundwater	35
WAL12651	90CA806845	Groundwater	52
WAL12653	90CA806850	Groundwater	166
WAL 12701	90CA806971	Groundwater	20
WAL 12715	90CA806981, 90WA807004	Groundwater	75
WAL 12724	90CA806981, 90WA807004	Groundwater	45
WAL 12731	90CA807045	Groundwater	3
		Sub-total: Groundwater	**396**
WAL 2682	90WA804771, 90CA802036	River - General Security	486
WAL 13051	90CA802398	River - General Security	96
WAL 14936	90WA801821	River - General Security	1,056
		Sub-total: River - General Security	**1,638**
WAL 16034	90WA801821	River - High Security	50
		Sub-total: River - High Security	**50**
WAL 2683	90WA804771, 90CA802036	River - Supplementary	53
WAL 13052	90CA802398	River - Supplementary	10.5
		Sub-total: River - Supplementary	**63.5**
		TOTAL:	**2,147.5**

Figure 2. Existing water licenses dedicated to the Vickery Extension Project. (Vickery EIS)

Assign From (Seller)			Assign To (Buyer)			Details			
Water Access Licence	Water Source	Category	Water Access Licece	Water Source	Category	Application Number	Date Assigned	Volume (ML)	Price Paid $per ML
90AL806889 - WAL No. [redacted]	UPPER NAMOI ZONE 4 NAMOI VALLEY (KEEPIT DAM TO GIN'S LEAP) GROUNDWATER SOURCE	AQUIFER	90AL806945 - WAL No. 12691	UPPER NAMOI ZONE 4 NAMOI VALLEY (KEEPIT [redacted] LEAP) GROUNDWATER SOURCE	AQUIFER	SWC782718	12-Nov-2019	28.0	$400.00
90AL806844 - WAL No. 12651	UPPER NAMOI ZONE 4 NAMOI VALLEY (KEEPIT DAM TO GIN'S LEAP) GROUNDWATER SOURCE	AQUIFER	90AL807011 - WAL No. 12718	UPPER NAMOI ZONE 4 NAMOI VALLEY (KEEPIT DAM TO GIN'S LEAP) GROUNDWATER SOURCE	AQUIFER	SWC783687	14-Nov-2019	70.0	$0.00
90AL806849 - WAL No. 12653	UPPER NAMOI ZONE 4 NAMOI VALLEY (KEEPIT DAM TO GIN'S LEAP) GROUNDWATER SOURCE	AQUIFER	90AL836245 - WAL No. 42478	UPPER NAMOI ZONE 4 NAMOI VALLEY (KEEPIT DAM TO GIN'S LEAP) GROUNDWATER SOURCE	AQUIFER	SWC783688	14-Nov-2019	266.0	$0.00

Figure3. Recent transfers of Zone 4 groundwater licences that were identified for the Vickery Project.

Instead of relying on the proponents own forecasts, actual water demand for the Vickery project may be more accurately forecast by using projected required volumes for the nearby Boggabri Coal Mine. These forecasts are based on an actual working mine under current climatic conditions.

Table 4-13 Predicted Water Demand

	Dust suppression (haul roads)	CHPP	MIA and Potable water
Period	Jan 2017 to 2033	Jan 2017 to 2033	Jan 2017 to 2033
Demand	1460 ML/yr	1460 ML/yr	365 ML/yr

Figure 4. Predicted Water demand for Boggabri Coal -total 3285ML/year. Source Boggabri Coal Mine Annual Review, Pg. 55
https://www.idemitsu.com.au/mining/wp-content/uploads/2016/02/2220016-REP-1_BCM-2018-Annual-Review.pdf

Boggabri Coal requires 3285ML (1460+1460+365) to produce 7 mtpa of Coal. On a pro rata basis this equates to 4693 megs for Vickery's peak production of 10 mtpa, not accounting for extra water needed for the externally mined coal it plans to process through the CHPP.

So if we look at the scenario that Vickery is up and running at full production with the current climatic conditions of 2019:

239mm rainfall Boggabri Post office (BOM) 1/1/19 – 1/1/20

0% allocation from river

175ML allowable harvestable right from non pit surface flows.
528ML pit rainfall capture (221ha x 239mm rainfall)[a].
518ML pit groundwater inflows (1.42ML/day x 365 days)[b].
160ML zone 4 from Bore field

Total 1381ML of inflows

Therefore
Total water requirements 4693ML
Total available water 1381ML
Leaving a deficit of 3312ML

a. 221ha is the maximum area of pit during life of mine, and assuming 100% runoff (no infiltration), ie. best case in terms of rainfall capture.
b. 1.42ML/day is the maximum life of mine predicted pit inflows, ie. best case for water capture.

The Consequences

These simple calculations prove the inaccuracy of the models used to determine the water requirements for the Vickery Extension project. The calculations above don't even factor in losses due to evaporation and seepage. They are also made under the assumption that there is no carry over water in storage or on the groundwater license after a deficit of 2791ML and no river allocations the previous year (Boggabri 2018 rainfall 368mm).

As Upper Namoi Zone 4 groundwater is the only locally available water source in these extreme dry conditions, 100% of the deficit would have to come from this source. The average licence entitlement in zone 4 is 127ML. For the proponent to procure 3312ML, they would have to obtain 26 of these licences. That is up to 26 farmers who would have to sell their water from their farms or more likely their farms as a whole, (detaching water from an irrigation farm drastically reduces the value of the land, so they are unlikely to do so).

"Worst case scenario" modelling for the Vickery Mine Extension EIS, conducted in 2018, has been based on a 26 year period beginning in 1915. As this "worst case scenario" has already been exceeded by the current ongoing drought, the current water budget must be scrapped and replaced with an alternative that is based on practical, real-time numbers and conditions.

Page 66 of the surface water assessment in the EIS under subtitle
7.5 Water Requirements, states that;

"*In accordance with the Project water management system's objectives and design criteria, the system has been designed to provide a reliable source of water for use in mining operations even in extended periods of below average rainfall. Although the water consumption requirements of the Project and the system water balance would fluctuate with climatic conditions and the stage of mine development, the water management system has been designed to be adaptable. Water may be obtained from licensed external sources if additional water is required for operational use.*"

This adaptive management approach to water licensing is unsustainable. The proponent must not be allowed to proceed with the development based on drastically underestimated water requirements, and then once the project is

up and running procure water by any means possible to the detriment of the local community and agriculture.