

Wallacia cemetery Proposal

Joe Grech
March 2019

I have looked at the proposal and I am impressed with the detail that is shown regarding groundwater run-off, drainage, ponds plus all the fine details of vegetation and so on.

In regard to floods there is also a large amount work that has been done by hydrologists and is quite detailed regarding rainfall, water flow rates, water retention ground contours and so on.

What amazes me is that with all the data collected and transferred to computer controlled modelling giving everybody detailed colourful maps with corresponding graphs, no one has included what happens when the Warragamba Dam opens it's main spillway gates.

A simple solution would have been to actually come to Wallacia and ask local people what really happens in this area during heavy rainfall, they would have been told that while the Nepean river is flowing it slowly rises in level due to the natural restriction at Nepean Gorge, when the water level gets to around 43m AHD water starts to top the Blaxland Crossing Bridge, Jerry's creek stops flowing into the river and starts backing up and eventually goes over Park road. Which gets cut off at 39.8m AHD Mulgoa road gets cut off even earlier.

This has not been shown on the very detailed reports we have seen. But in my opinion a considerable amount of data has not been added or used in the plan.

What we don't see is when the Dam opens it's spillways to release water for SAFETY reasons the extra water flowing down the Warragamba river to Norton's Basin joining the Nepean River actually slows down the flow of the Nepean River causing the River to back up at Wallacia.

While most of the flood data in this plan is based on a 1% AEP there is no mention at all of levels AFTER the Warragamba Dam opens it's spillways.

In the report a flow rate of the proposed catchment draining into Jerrys Creek is stated at .9 to 3.4 cubic metres per second which is all well and good until the Nepean River rises to a level of the same height as Jerry's Creek. While I am by no means a Hydrologist I know that water can't flow if there is no where for it to go, so if the river rises due to backing up caused by the released water from Warragamba Dam, Jerry's Creek will also rise throwing all the fancy maps, graphs and computer models for the proposal out the window. Flood waters sometimes back flow from the Nepean river into Jerrys Creek. If is still raining in the Wallacia Flood plain, run-off will still be coming into Jerrys Creek and with flood waters not flowing into the river the level of Jerrys creek can only go up even higher.

Photographs

Looking at the old photographs taken of floods at Wallacia will show the level of some of the flooding, classic photographs are the aerial photographs taken by the RTA in 1964 which was a 1:30 or 3% AEP (Annual Exceedance Probability) event. (Figures from Molino Stewart Hawksbury Nepean flood damage assessment report 2012)

It is in stark contrast of the 1% or 1:100 that the modelling for this proposal is showing. (Figure 3 FLOOD DEPTH LEVELS-1% FLOOD EVENT WALLACIA BY GRC HYDRO AND URBIS) It clearly shows the huge difference from a projected model/map and the actual levels in real life. This proves that a Model or Projected plan is only as good as the information put into it. The differences between the 1964 actual flood and the 1% model is influenced by the Water released from Warragamba Dam.

The true levels of flooding in Wallacia are burned in the minds of the people who lived through them. In one picture there is water over Park road with the water level near the top of the power pole that is approximately 4-4.5m of water over park road. Mulgoa Rd at the bridge disappears completely so does Water St on the Silverdale road bridge water level is just below the street lights. # In the past during a flood people were too busy trying to help their neighbours move stock and belongings to safe ground, not looking for a camera and a roll of film to take pictures we are lucky to have some photos. Today with mobile phone cameras, a flood can be shown all over the world in minutes. I personally have seen Jerry's creek over Park road with flood water up to the upper windows of the house on the corner of Golfview Dr and Park road and the house on the left of Mulgoa road just North of the Jerry's Creek bridge with water over the roof. The Sydney Water sewerage pumping station on Park Road near the fire station was designed to be flooded over and it's approximately at 43m AHD, locals have seen previous flood water lapping at where the fire station is now, and most of the Wallacia School playground under water. In 1867 the water level reached near where the hotel is today.

With Climate change today the rain is especially unpredictable, a PMF could happen at any time, look at what happened at Wivenhoe Dam in Queensland in 2011, a wave of water flowing into the river that came close to Brisbane.

Whether you believe in climate change or not we are getting more storms and heavier rainfall plus extreme weather conditions.

A PMF event 1:45000 or 0.002%, flood could occur, it requires only 11mm per hour over the Catchment area for 72 hours with a full and saturated catchment area it could trigger an event at Warragamba Dam. Wollongong 1984 – 440mm fell in 6 hours over a 100 square kilometre area, that is 73mm per hour another way to look at it is if the PMP (probable maximum precipitation) occurred in the Warragamba catchment it would be at a critical level for Warragamba dam in 24 hours it would probably trigger the Emergency Spillway. (information from vol 2 of the hazard and risk in hawksbury-nepean valley)

A flood of around 47 metres equivalent to the 1867 flood estimated at a 1:170 or 0.4% would also trigger the Emergency Spillway.(sourced from NSW SES 2005 Hawksbury/Nepean Flood Emergency sub plan)

A probable mean flood PMF event could see flood levels at Wallacia reach as high as 60m AHD leaving a small strip island on Greendale road

##The Emergency Spillway: this was built to protect the main dam wall from overtopping, it is a fuse plug type wall 190 metres wide and 14.5 metres down from the maximum water level to the Emergency Spillway floor, it is designed to wash away when the water level reaches that predesigned level. The danger being more water coming into the catchment than what can be released by the normal spillways causing a gradual build up of water. When this Emergency Spillway opens, an **additional 18 million litres PER second** will go down river it is fully automatic with no way of stopping it till all. Activation of this Emergency Spillway will drop the water level of the whole Burraborang catchment behind the dam by 14 metres, and will remain at that level until the wall gets rebuilt. All that water must go downstream and back towards Wallacia.

Modelling of a flood zone is a good tool for general conditions, Wallacia has a unique problem in that there are 2 types of flooding, one is with normal river rising and can be modelled with rainfall, water flow and water levels, the other is water input into the Nepean River from the Warragamba River when the Warragamba Dam main spillway opens, this is when the river starts to slow due to the Nepean Gorge restriction and can back-flow into Jerrys Creek

Any competent Hydrologist should know the consequences of a massive dam fitted with an emergency fuse plug spillway only a few kilometres away from a major project with a direct connection between the Nepean River and Jerrys Creek.

In a PMF event, the highest point of the Golf club grounds could be 6 to 10 metres under water for weeks depending on tide levels in the Hawksbury Nepean River system due to the Bathtub effect caused by natural choke points in the system.

In the plan it states the development will be outside the 1:100 AEP yet real time photographs clearly show the level of flooding of an actual 1:40 AEP flood event in 1964, the discrepancies are not small they are huge. The water level reached in 1964 was recorded at 43.9metres at the Wallacia Weir, the water over Park road and Mulgoa road was roughly the same at 4 metres, power cables are usually 4.5m above an intersection This proves that modelling of this area requires special parameters, a 1% AEP would have a river level of around 46metres AEP or higher depending on the release duration of water from Warragamba Dam. That means 46metres AHD at park road. Yet your plan shows a 1%AEP only having .3 of a meter of water over park road. If the river height at the weir is between 45.8m & 46m in height during a 1% AEP and Jerrys creek is connected to the Nepean River how is it in any way possible that there is only .3 of a meter of flood water over Park road (maybe the Catholic Cemetery people have Moses on speed dial)

In my simple way of thinking a 1% or 1 in a 100 flood, is much bigger than the 2.5% or 1:40, flood which happened in 1964 and also very similar in 1978 so a 1% AEP could have water over Park road at a height of approximately 46metres AHD, with Warragamba Dam main Spillway open but not the Emergency Spillway, (above figures from Hazard and risk in Hawksbury-nepean flood plan Volume 2)

I would like the IPC to stop or at least put a hold on a decision until all the relevant flood information I have spoken about is checked, The Manly Hydraulics Laboratory did have a scale working model of Warragamba Dam and the Hawksbury/Nepean system, it had the ability to have water flows using the normal Spillway and the Emergency Spillway operating showing downstream flooding. If the model is not available they should have all the data on file as it was used for modelling of the Emergency Spillway Construction for Sydney Water and the Catchment authority.

The facts are out there I am not an expert in this field just an old retired mechanic and I found a lot of this information and much more in a few days. There is a lot of data missing (accidental or intentional) from the model presented. How can a commercial, ethical or moral decision be made with only selective or partial information provided for the proposal.

By Joe Grech March 2019

Automotive Engineer (Retired)

Former president of the Wallacia Progress Association

Was a Member of the Warragamba Dam Auxiliary Spillway Construction
Community Liaison Committee

Also was Member of the Sydney Water Sewerage Scheme for Mulgoa, Wallacia &
Silverdale Liaison Committee