Warragamba Dam wall raisin
SSI – 8441
Submission

Chapter 15 Flooding and Hydrology
15.4.1 Historical flooding in the Hawkesbury-Nepean Valley

As written: Significant rainfall event that occurred in February 2020 downstream flooding was estimated to be about 1 in 5 chance in a year event. At the time Warragamba Dam capacity was less than 50% full, and all upstream inflow was trapped by the dam with no spill downstream flooding was therefore wholly a result of local flooding with no contribution from the Warragamba Catchment.

My comment: While this is correct, the statement does not say that the Upper Nepean Dams on the tributaries of the Nepean River, upstream of Camden, and entry below Warragamba Dam, were also well below full storage capacity.

Since records of floods and river level heights have been recorded at Windsor from about 1799 there have been many times when multiple flood occurrences in a given year:

1857; July & August with moderate flooding
1860; February, April, July 7 November with moderate flooding
1864; June & July with Major and moderate flooding
1866; June & July with moderate flooding
1867; April & June with moderate and Major flooding (June being the highest recorded)
1870; March, April, May & November with moderate & Major flooding (May the biggest flood in Burragorang Valley i.e., above the now Warragamba Dam.
1871; May & May (2 in one month) moderate flooding
1877; May & July with moderate flooding
1929; February & October with moderate flooding
1950; January, March, June, July & October with moderate flooding
1952; June, July & August with moderate flooding
1956; February & June with Major and moderate flooding
1963; April, June & August with moderate flooding
1974; April, May & August with moderate flooding
1988; May & July with Major and moderate flooding
1990; April & August with Major and moderate flooding
2022; March & July with Major flooding

Other earlier Major flooding events that seem to be overlooked (recorded at Windsor):
1806; March 12.9 meters
1809; May 14.7 meters
1816; June 14.1 meters
1817; February 14.4 meters
1819; March 12.9 meters
1873; February 13.1 meters (note; highest recorded on Nepean at Camden 14.2 m)
1875; June 12.28 meters

1879; September 13.62 meters
1889; May 12.15 meters
1890; March 12.28 meters
1900; July 14.5 meters
1904; July 12.64 meters
1949; June 12.11 meters
1960; Warragamba Dam completed
1961; November 14.95 meters
1964; June 14.57 meters
2021; March 12.93 meters

Another fact that seems to be missing in the report is the correlation of flooding on the Nepean River (recorded at Camden) and its effect in the Hawkesbury – Nepean Valley, with its entry below what is now Warragamba Dam.
In June 1867 the largest flood recorded at Windsor is 19.68 meters but a there was 14.2 meters recorded at Camden on the Nepean River at this time. The highest flood at Burragorang Valley (above what is now Warragamba Dam) came three years later in 1873. So, the 1867 flood most likely came from high flows from all tributaries above (and possibly below) Windsor.

The flood recorded at Windsor of February 1873 was 13.1 meters with the Nepean River level at Camden recorded at 16.53 meters (the highest recorded at Camden) and so most likely this flood at Windsor most likely resulted from waters from the Nepean with not a great deal from the Warragamba (perhaps the hydrologists could work it out best?).

A flood recorded at Windsor in February 1898 was recorded at 10.08 meters with the Nepean River at Camden recorded at 15.21 meters (second highest recorded at Camden), so most likely the flood at Windsor came from the Nepean with not a great deal from the Warragamba (perhaps the hydrologists could work it out best?).

A Major flood recorded at Windsor in June 1949 at 12.11 meters had the Nepean River at Camden recorded at 12.46 meters, so a great deal of influence from the Nepean below what would later be Warragamba Dam.

A Major flood recorded at Windsor in February 1956 (during the construction of Warragamba Dam) was recorded on the Nepean River at Camden at 12.42 meters, so a great deal of influence at Windsor.

A Major flood at Windsor in June 1964 recorded at 14.57 meters and recorded on the Nepean River at Camden at 14.08 meters would have a great influence of the river level at Windsor.

A Moderate flood at Windsor in March 1977 recorded at 8.9 meters would have been mainly from the Nepean through Camden recorded at 12.80 meters.

The point is, in my opinion, there has not been enough research within the EIS that fully examine multi floods in a given year (or a closer period) that would be significant if this

project were to proceed, as flood history has shown, at least within the Hawkesbury-Nepean Valley, there have been wet seasons where 2 or more floods have occurred within a month, within continuous months and separated months within a given year. The first of these events were recorded as far back as 1857 and it is not a new phenomenon and almost certainly occurred pre-European settlement.
This would have a profound effect on a structure that would capture a first event but could not prevent spillage if subsequent events followed. When a dam fills, it will spill.

The other point is, although mentioned, the influence of other rivers below Warragamba Dam, have not been fully assessed, as above, the influence of the Nepean and Upper Nepean Rivers and their Dams.

Figure 15-15 Relative contribution of different river catchments in a range of floods in the Hawkesbury-Nepean Valley

Gives examples on a graph of flood events with water coming from: Warragamba, Nepean, Grose, South Creek and others for years 1961; 1975; 1986 7 1990.

Note: the August 1986 flood event was smaller than a 1 in 20 chance per year flood, with Warragamba Dam contributing only 42% of the total volume at Windsor. This is because Warragamba Dam storage level was relatively low and captured a large portion of the incoming flows thus delaying the downstream flows. If Warragamba Dam had been full, the Warragamba Catchment would have contributed 57% of the volume at Windsor.

The above statement is bias as it does not mention that the Upper Nepean Dams, Cataract, Cordeaux, Avon, and Nepean Dams were also low at the time and had to fill before spilling into the Nepean River system.

Perhaps another new extended graph including earlier and later floods such as the: June 1867; February 1873; February 1898; June 1949; February 1956; June 1964; November 1969; March 1977; March 2022 & July 2022, may get a better unbiased result?

In any event after Warragamba Dam being built should include the storage level of the Upper Nepean Dams to exclude a bias of all part full dams at the same time.