The Effects of a 20 year flood at Kempsey

A flood of once in 20 year recurrence interval in the Macleay River would reach a level on the gauge at the Kempsey Traffic Bridge of about 7.5m (1989 Flood Study). (Note that zero on the gauge is equal to 0.525mAHD, so to obtain AHD from a gauge reading, we need to add 0.525m). Thus the 20year AHD level at Kempsey will be about 8m. It is preferable to use the gauge reading for Kempsey as all the flood warnings, predictions and forecasts are based on this datum. However for engineering use levels are converted to AHD as the construction plans and flood studies are based on that datum.

There has not been a flood of this magnitude since May, 1963 (although that was rated as 1 in 15yrs). The 1963 flood reached 7.14m on the gauge. The flood of March, 2001 reached 6.9m on the gauge.

For a I in 20 year flood, a typical rainfall pattern would be 150 to 200mm over the upper catchment (tablelands area) and 300 to 400mm over the middle catchment down to Willawarrin over 48 hours.

Rainfall of this intensity should trigger flood warnings from the Bureau of Meteorology.

The Bureau of Meteorology (BOM) should issue a “Confidential Flood Warning” if they predict or are aware of heavy rain in the upper catchment. This should be faxed to Council’s Engineering Department.
A formal warning should be issued to Council by the BOM as follows:-

- 7 to 10 hours notice of a level in excess of 6m at Georges Creek
- 24 hours notice of a predicted height above 5m at Kempsey
- 12 hours notice of a river level of 5m at Kempsey

A flood of 7.5m would be classified as a Major Flood as it is above 6.1m.

When Council or the SES become aware of a possible river level of 4m at Georges Creek, preparations commence for flood control. This is the level at which the upriver bridges (except Sherwood) will be covered by fast flowing water and may lead to a level of about 0.85m at Kempsey. In the past, at this level at Georges Creek, barricades were placed out on the low level bridges. Council has recently resolved not to place out the additional barricades, signs and lamps in the future. However it will still be necessary to monitor the bridges and to clear them immediately after the flood recedes

Observation of the levels at bridges and the main river gauges, Bellbrook, Turners Flat and Aldavilla will indicate the movement of the rise down the river. The SES will become active when the river level reaches about 4m at Georges Creek

The intense rainfall will cause rapid rises in the Macleay River at Georges Creek. In a 1 in 20 year situation, a level at Georges Creek of about 14m could be reached. This would cause bank erosion, possible road slips, roads flooded, pump & property damage, etc.

Table of approximate gauge levels and flow times (from Georges Ck)

Georges Creek	Bellbrook	Turners Flat	Kempsey	Comments
4m	3m (+8hrs)	2.65m (+16hrs)	0.85m (+24hrs)	Upriver bridges closed
8.5m	7m (+9hrs)	5.8m (+17hrs)	4.5m (+25hrs)	Minimum level for control gates opening
9m	7.3m (+9hrs)	6m (+16hrs)	5.2m (+24hrs)	General overbank flooding
13.8m	**15.5m +5hrs)**	**13.7m (+11hrs)**	**7.5m (+16hrs)**	**1 in 20 year flood (1963)**
17m	17.5m (+4hrs)	18m (+10hrs)	8.2m (+14hrs)	1 in 100 year flood (1949)

NOTE: Levels and times may vary according to flood and seasonal conditions. These are gauge levels. To obtain mAHD at Kempsey, add 0.525m to gauge level.

As the flood often comes at inconvenient times (weekends, night) all flood controls and gates should be checked in advance and made ready. The main ocean outlets at Ryans Cut and Big Hill should also be checked for sand build-up which may need to be removed later. Flood flaps on drainage pipes at Gladstone, Smithtown and Nestles should be checked to ensure they will seal. The water quality monitoring gauge arms should be lifted onto the banks or tied off.

Local Warnings

When a level above 8m at Georges Creek is predicted, the LEMO will be informed and downriver farmers should be warned that it is likely Council will have to operate the flood control structures about 24 hours later. Advance warning notices should be issued to local radio stations for broadcast and several downriver farmers contacted to spread the word. This gives them time to evacuate stock to higher ground. (About 24 hours notice is needed). Council staff and the SES should also prepare to place out “Cattle on road signs” in advance. Signs should be placed on the Highway at Second Lane, (facing northbound traffic), Great North Rd (north), Smithtown Road (south), Clybucca Hill (south), Barraganyatti Creek (south). Other fixed signs on local roads should be unlocked by Council, SES or local volunteers.

Flood Control Structure Opening

Observation of the approaching flood continues until a level of 4m is reached at the Kempsey Traffic Bridge (KTB) gauge. Previously all the control gates were gradually opened from 4.1m on to about 4.6m on the KTB gauge. However with the raising of the Kinchela Creek levees, this will change. Until all the levees are raised it will be necessary to physically observe the situation and identify any low spots or problems. With the elimination of the lowest area on Kinchela right bank, it should now be possible to delay opening the control gates until about 4.6m or later on the KTB gauge. Ultimately when all modifications are complete, the Belmore gates may be opened at a reading of 4.6m and the Kinchela gates at 4.9m on the KTB gauge.

When the approximate time for the gate opening is known, a final notice of the intention to open the control gates should be issued over the radio about two hours in advance. This gives farmers a final chance to clear cattle and equipment from the

floodways. Actual timing will depend upon tides, darkness, level, etc.. The LEMO should also be advised.

The control gates should be gradually opened in several stages until full outflow is reached. It is preferred to have one operator at the Belmore gate and one at Kinchela, with the Flood controller inspecting and liaising between the two by two-way.

Opening the gates should not be delayed for too long as operators may be stranded by floodwaters. If possible a 4WD vehicle should be used by all involved as at night the work can be very hazardous, driving through deep water, etc.

Once the gates are opened, it is necessary to observe the situation for problems and future reference. Roads will become covered in water and should be barricaded. Checks should be made on the ocean outlets at Ryans Cut and Big Hill, to assess the need for machinery to open the channel and any required work arranged.

All flood level information will be given out by the SES, who will operate their headquarters. Council is not required to provide information on levels, but should advise of actions on the control structures and liaise closely with the SES on the data and any problems encountered.

Flooding in Kempsey

The peak of such a flood (7.5m on Kempsey Traffic Bridge gauge or 8.025 AHD) would reach Kempsey about 16 hours after the peak at Georges Creek.

Floodwater would first enter Kempsey from over the Eden Street levee. The Eden Street levees have a crest level of 7.4m AHD and would overtop when a level of approximately 6.15 is reached on the Kempsey Traffic Bridge gauge. Water would quickly enter the town.

All of the Kempsey CBD would be inundated (the Westpac corner is about 7.5m AHD). A level in the Kempsey basin of 7.7m AHD could result in water to a depth of 3m over the lowest part of Belgrave Street and to 1.5m near Woolworths.

Kemp Street, and Sea Street, West Kempsey would be closed at two low areas and Council's depot would be partly flooded (not the store or workshop). The top gate would be available for access.

The railway line may be open, but could suffer localised damage at culverts, wash-aways, etc.

The two Kempsey sewerage treatment plants are built above the 20 year level, although some pump wells and effluent ponds would be flooded.

Water supply should not be affected, although that is subject to electricity supply.

Access to the airport may not be open, as Sherwood Road would possibly be cut at Ronella Drive.

Flooding in other areas

Pacific Highway would be closed after the gauge level at KTB exceeded 5.2m and the downriver levees would begin to be overtopped.

The peak level at Seven Oaks corner (Smithtown Road) could be 5.0m, (about 2m deep) and this would be exceeded in other lower areas (Clybucca Flat, Bellimboppini, etc).

The level at Frederickton would be 6.3m and water would enter the town from the north.

All of Smithtown except Nestles would be flooded (level of 4.8mAHD) and all of Gladstone except some high land around the Police Station and the bridge (4.5mAHD).

South West Rocks, Hat Head and Crescent Head would be isolated and all of the rural areas inundated.

It may be necessary to evacuate people from the lowest areas to emergency centres in Kempsey. People from the Kinchela/ Rainbow Reach area might go to South West Rocks and other coastal areas.

Extensive inundation could last for a week, as it did in 1963.

Aftermath

Following the flood, Council would be extremely busy, repairing damaged roads, bridges, trees, buildings, etc. Mud would need to be removed from streets and a large volume of garbage, rotten food, damaged electrical equipment, etc taken to landfill. There may be problems restoring clean water supply to prevent backflow into the mains, repairing damaged electrical components and repairing sewerage pump wells.