Submission re Grafton Bridge duplication

After a necessarily brief viewing of the EIS documentation at an RMS Public Display on 4th September 2014, I am particularly concerned about the flooding aspects of the proposed new bridge. My concerns are that insufficient information has been provided to enable proper understanding and assessment of the effects on future flooding of Grafton and surrounds. Although a lot of data was obviously supplied to, or derived by, the Consultants WBM, very little has been included in the public documents on display for public comment. For example

(a) It seems to me that, from basic channel-flow hydraulics, it is no secret that if any obstructions (piers) are placed in a flowing stream (Clarence River), there are 3 major effects if the flow is confined (levees) to the channel - the water level upstream increases, the velocity of water flow through or around the obstruction increases, and downstream of the obstruction the water level increases. The 1st effect has been widely reported in the EIS and increased flood levels upstream of 60 to 100mm have been identified, so it is intended to raise 10.7kms of upstream levees by up to 200mm (to be sure, to be sure). However I could find no mention of the 2nd effect, except for a coloured map purporting to show velocity by graduated shades of pink. There is no attempt to quantify the increased velocity, nor anything about any resulting increased erosion of the streambed, nor where that eroded material will be deposited, nor what effect that siltation downstream will have on flood levels. I could find nothing at all about the 3rd effect, i.e. increased water level downstream of the bridge, nor its effect on future flood levels downstream, (except for the bald, unsubstantiated statement on Page 25 Appendix E "Unmitigated Impacts", which of course is irrelevant if mitigation is proposed). Has it been quantified? If so, with what result?

(b) In any major study of this nature I understand that it is usual to have an independent "peer review". That is, another expert assesses the findings of the first. I'm told that this was done, but none of that information is available to the public, not even a summary. Why is that? Was it favourable, or not?

(c) To reach their conclusions, the Consultants obviously had access to detailed survey information showing the existing crest levels of all levees in the Grafton area. None of that information is provided, nor, I was told, is it available to the public. Why is that? Is there some secrecy?

(d) The obvious errors in Tables 5-3 and 5-6 (Appendix E) make a mockery of the forecast impacts of Mit Options 2 and 4, and certainly don't inspire much confidence. Also I was confused by there being two different Appendices A, B and C in the one set of documents.

(e) I couldn't find any conclusion in Appendix E regarding a decision or choice between Mit Options 2 and 4.Which is the preferred Option? (It makes a huge difference to local residents, depending on one's address). Later, it has been pointed out to me that the EIS itself, at P164, adopts Option 2 as the preferred option, with the only justification being that Option 4 would require some raising of a short section of the Gwydir Highway. I imagine that the cost of raising 550 metres of the highway would be more than offset by the savings made from not needing to raise 2.3 kms of levee, so the logic of that decision is elusive.

(f) Could there be some confusion about the Prince St gauge records and predictions? Page A-9 states that the Jan 2013 Flood peaked at "RL 8.09, a 1 in 27yr ARI event". Elsewhere it is stated that the North Grafton Levee provides a 1 in 20 yr protection (RL 7.95), so the first obvious question is why wasn't there major overtopping in January 2013? From my recollection, the Deputy GM of CVCouncil stated after that event that the levee didn't overtop at all. Yet, on Page 5 Append E, it states that significant overtopping occurs during events greater that 20yr ARI - is there an error in the baseline data somewhere?

(g) The information on the impact on Local Drainage in North Grafton is totally inadequate, in my opinion. Without any justification, the report states that a 1,500 CuM detention basin is required and a pump/s of 2 m^3/sec capacity. There are a myriad of unanswered questions arising e.g.

(i) How were these sizes derived?
(ii) Has anyone seriously considered the huge physical size and power requirements of a 2 m^3/sec pump?
(iii) What power will be employed – I imagine the town electricity could not be relied on, and in fact could be turned off prior to overtopping, so will it be diesel fuelled? Where and what quantity of fuel will be stored on site? How many days supply? How will the safe shelf-life of 20 – 50,000 litres of diesel be managed?
(iv) Who will own, manage and operate the pump?
(v) The proposed detention basin holds only a 12.5 minutes reservoir of water – will there be dangerous velocities of make-up water through the proposed culverts under Pound St?
(vi) Will there be negative pressure created in the existing interconnected street stormwater system, resulting in sediment and sand being sucked in through cracked conduit joints, and collapse of pipelines, as has happened in every flood since flood-pumping commenced in Grafton?
(vii) What are the expected noise levels?
(viii) What size will the rising main be, how will it cross the levee and discharge to the river?
(ix) How is proposed to monthly service and start-up the pump/s without a water reservoir?

The logistics of the whole proposal is a minefield, and in my opinion it is unacceptable to say "Oh, we will look at that at the detailed design stage". Surely it must be looked at now, prior to project approval?

(h) Appendix C, Page C-3, explains that an historic rainfall event (2009) was simulated for verification purposes in the Local Drainage scenario. Surely a much more significant event to use for verification would have been the March 1974 flood, when (from memory) something like 420mm rainfall was recorded after closure of the floodgates? Would the proposed bridge have been accessible via Pound Street in that rainfall event?

(i) With regard to North Grafton, I find it confusing that the predictions of existing and future ponding are sometimes related to Prince/Pound Sts., sometimes Fry St/Alumy Ck and sometimes North St/Alumy Ck. (Obviously, the references to Alumy Ck need careful explanation – are those references related to overtopping of the Grafton Levee, or it is ponding from overtopping of the Westlawn Levee, or the Pine St Levee?) Because the ponding in Grafton occurs in at least 3 separate basins, with the ridge following Queen St being the crucial separator, should not separate predictions be included for each basin? As the Eastern Basin is the 1st to flood, and also the deepest, why aren't predictions given for reporting locations in that basin? ,Also, the precise location of the "reporting location" should be specified – for example "adjacent to North St/Alumy Ck" is meaningless - what is meant by adjacent? What is the precise location?

(j) The proposed raising of 10.7kms of existing levee is a major operation. I would have expected a lot more detail and discussion about the methodology, bearing in mind that most of it will be in private property, and much of it is not benefited by existing easements. Apart from an "artist's impression" or two, there are no details explained. In the knowledge that adding 200mm to a concrete levee sounds easy, I would have expected the proponents to address their intentions re weak subgrades, deteriorated sheet-piling and/or cut-off walls, concrete footings etc., and the disruption to private property, in greater detail.

(k) The documents continually state that levees are to be raised by "up to 200mm". What does this mean? If the hydrology and hydraulics have been done, why hasn't the magnitude of the levee raising been specified? Is it 200mm, or if not, what is it? Are more studies proposed?

(l) The Cowan Ck Levee, an adjunct to the South Grafton Levee, does not rate a mention at all. Surely it will also require raising? By how much?

(m) The proposed raising of the levees upstream of the bridge, but not downstream, raises a number of issues. The EIS should have identified the existing low-points in the whole levee

system (relative to the gradient of the River in flood), existing spillway sections, and the pre-bridge overtopping patterns. Then, the post-Bridge effect on these. i.e. will levee overtopping occur in the same locations as pre-bridge, and to the same depths, as in post-bridge construction? Or does the raising of the upstream levees simply shift the problem to downstream?

(n) Is it intended to raise the whole of the South Grafton Urban levee? Are there existing extensive sections that have, by design, far greater freeboard than others? Will the same freeboard be maintained?

(o) Before project approval is issued, I submit that the whole levee system should be carefully assessed. For over 40 years, residents have been told that Grafton has protection from the 1% Flood. Suddenly, we are told "oops, make that 1 in 20 (5%) year protection". Surely there is a moral obligation to give 1% protection, even though there could be arguments that some of the cost should be contributed by other than RMS? If this is ignored, and only 10.7 kms of levee is raised by RMS, and an overtopping event occurs, the residents of Grafton and the Lower Clarence would, rightly or wrongly, blame the RMS and the new bridge for whatever goes wrong, and huge class-actions would no doubt follow (cf Nyngan 1990 Flood)

(p) Page 89 Append E "Emergency response and evacuation" seems to be a one page "she'll be right, mate" approach. Although it could be argued that an in-depth assessment could be beyond the scope of the Bridge EIS, I think that a lot more information should have been accessed and reported. Bearing in mind that perhaps 8,000 people will require evacuation, it seems that sending them to Junction Hill, in the early stages, achieves little, as there no facilities available to house and feed people. Fig 8-1 presents the "evacuation strategy", which is meaningless without explanation – is "Sector A" evacuated first? It contains some of the highest land in Grafton, is by far the easiest to evacuate, and contains critically important amenities such as the one and only Police station, Council, State and Aust. Govt headquarters, Grafton Shoppingworld, Churches etc. Is this really a good plan? Shouldn't the highest and most accessible buildings be the last evacuated?

I urge you to address these questions before project approval is issued.

Mike Gorrie
219 Fry St
Grafton
18th September 2014