

Blackbutt Creek Floodplain Risk Management Study and Plan Submission Response Details

Submission number	Details of submission	Response
1	So basically what you are proposing in this is that floor levels be raised and all structural engineering etc. for renovations or building works. It has never flooded at the residence where you say you have a high rate of flood. I don't agree with this plan.	The location and nature of the flooding issue was identified through modelling undertaken for the publicly exhibited and Council endorsed 2014 Blackbutt Creek Flood Study – details of the modelling assumptions can be found in this study on Council's website. The mapping which indicates your property is in the Mainstream Flow flood planning area is based on the 1% ARI (1 in 100 years) peak flood plus the nominated freeboard (0.5 metres). Buildings affected may not need to have the floor levels raised, however, appropriate freeboard and floor levels need to be considered for areas identified as flood prone as per the NSW Floodplain Development Manual and NSW Flood Prone Land Policy. Council's DCP also contains controls for appropriate freeboard and floor levels.
2	Flood risk with Blackbutt Creek can be minimized if Ku-Ring-Gai Council will keep it clear of refuse; both man and nature-made. My wife and I often see both kinds of obstructions in it on our daily walks on Minnamurra Ave and Place. This issue does need closer though as its continuation risks those of us near Blackbutt to have our home insurance rates continually raised by insurers; even if those like us are not in any danger of all but the most serious flooding (we are a good five meters above the creek). Please see that Blackbutt Creek is kept clean and any flood risk will be minimized.	Some known debris blockage hot-spots are inspected routinely; however blockages and build-up of debris along Blackbutt Creek, along with most drainage lines and watercourses on Council land, are addressed as complaints are received by Council. As this is considered an operational issue, a request has been generated on behalf of the resident for this matter to be investigated. Council only removes debris from the main channel that has the potential to cause blockages, however growing vegetation is not removed from the embankment in mainstream or minor channels.

		Council staff, OEH staff and the consultants employed to undertake these studies are very conscious of the problems associated with insurance premiums and undertake all studies and plans with the best information available, following the NSW Floodplain Development Manual.
3	During medium to heavy rain a lot of the excess water that flows down Fitzroy St should end up at the end of the cul-de-sac and into the drains running along the Gordon golf course. However, due to the out-dated drain system along Fitzroy street, a lot of this water from the street ends up flowing down my driveway and eventually finds its way into my back garden and into the storm water drain that runs through my back garden and into the golf course. If the drains on Fitzroy St were working properly, I should not have any of this water from the street re-directing down my driveway and into my property. Could we have this looked at as part of this study please.	Desktop investigation indicates that the property has a legacy of the old style driveway system incorporating a pipe crossing, which is prone to blockage from leaf debris, and a flat driveway into the premises. The flat driveway offers no threshold for protection from any rising gutter flow when the pipe is blocked and results in water across the driveway. Residents may be unaware that the pipe crossing forms a component of the private driveway across the nature strip, including the asphalt between the road pavement and the property line. As such owners are liable for costs associated with the construction, maintenance and repair of a vehicular access under Section 218 of the <i>Roads Act 1993</i>. To avoid this, Council recommends removing the pipe crossing and changing to a layback access. Residents may apply to Council for required driveway levels and seek advice from Council on construction of their vehicular access.
4	In my opinion, it is ludicrous to consider the subject property as a high trapped zone. In the last 21 years, that is since we've owned the property, we never had floods. In addition, just by looking at the inclination of the land, you can see that nearly a quarter of Sydney will be flooded before this property is. I would therefore ask to reconsider its zoning.	The Floodplain Development Manual 2005 requires flood studies and flood risk management studies and plans to address the management of continuing flood risk to both existing and future development areas. As continuing flood risk varies across the floodplain so does the type and scale of emergency response problems and therefore information necessary for

		effective Emergency Response Planning (ERP) needs to be included. The front section of your property is shown to be impacted by the Overland Flow flood planning area, not the Mainstream Flow or flood water rising from the creek. As such, your property has been identified as having restricted access during a flood event and is therefore considered as 'High Trapped Perimeter' on the Emergency Classification Response maps. This is used by the SES and Council to develop appropriate plans for responses during floods. This emergency classification mapping is only intended as a guide for flood response considerations and is not for zoning purposes. Notations have been added to the maps to clarify this.
5	Please look at stormwater drains in Rand Ave, especially outside the subject property. Kerb and guttering in Rand Avenue is not suitable for amount of rain especially when large in particular kerbs close to Pymble Avenue. This area must deal with runoff from both ends of Pymble Avenue and also run off from PLC. Look into source of Water in creek, up Pymble Ave somewhere. Sydney Water burst pipe? Basement pump out?	Council's Water and Catchments Program Leader inspected the water flow and Sydney Water was notified of a potential potable water leak on 8/05/2018. A Sydney water crew inspected the site on 09/05/2018 and determined that the leak was likely due to a broken service line and a plumbing contractor was sent out to undertake repairs. However, the plumber could not find the source of the leak and no works have been undertaken. The water is still flowing. Council staff have followed up again with Sydney Water. The matter has also been referred to Council's Drainage Asset Engineer to investigate the network capacity and water source, who will respond directly to the resident on this matter.

6	Question about regular maintenance and clearing of stormwater drain particularly on Ryde Road at the corner of Nadene Place. Water running through stormwater pipe most of the time – you can hear it.	Maintenance of the drainage network on main roads, such as Ryde Road, is carried out by contractors on behalf of RMS, whilst on local roads Council undertakes routine maintenance of the pits and pipes. Unusually constant water flows may be due to a leak in Sydney Water’s infrastructure and should be reported to Sydney Water. Council staff believe that this issue is related to the potential potable water leak identified in Submission 5.
7	Incorrect emergency response classification of my property? Figure A-5: 20% - Indirect Figure A-6: 1% - High Trapped Perimeter Figure A-7: PMF – Indirect	This error has been addressed in the revised report. Figure A-6 should have been categorised as Indirectly Affected.
8	1. Our property (in the flood zone) is on the low side of a proposed large Nursing Home Development 3 blocks wide (not in the flood zone) with extensive underground car basement with driveway adjacent to our dwelling. Our land slopes gently down in a NW direction. Predominately Sydney Sandstone. What impacts will a development of this scale have on water run-off and seepage? Are there different impacts on fruit/vegetables, exotics and natives? What are the possible and likely problems with retention and detention tanks? When is it necessary or desirable to have a pump out system in the basement? From our experience (at a workplace) these pumps are noisy and run intermittently throughout both the day and the night. What controls are in place to ensure that pump noise does not exceed acceptable limits? 2. We’d like to see controls on the use of hard-surfacing to replace existing green cover, re. Public Awareness In our experience with gardens and landscapes, it is crucial to slow run off and to allow as much water as possible to seep into the ground. This can be done by	1. Comments on a specific development application (DA) are beyond the scope of this public exhibition process, however the issues raised in the submission are considered as part of the DA approval process. 2. Council’s Development Control Plan (DCP) contains controls for landscaping and the built upon area; impacts on nearby vegetation; and water management, which address water quantity and quality impacts from development. In addition to the controls contained in Council’s DCP, Council also delivers the Water Smart program, which encourages water sensitive urban design and sustainable water management on private properties, through the provision of educational information and rebates for residents to undertake improvement works, such as the installation of rainwater tanks,

	using appropriate planting on slopes (e.g. moisture-lovers at the lowest points, plants that can tolerate both drought and occasional flooding e.g. many natives, e.g. callistemon) and also by making use of swales and terracing. The role of trees in utilising water, and in modifying climate effects is also very important. If these simple but effective ideas and practices could be part of the public awareness program, the residents would be helping to mitigate effects of flash flooding or excess water run-off and also building up the land's health and resilience. There needs to be education (as well as legislation) for the use of appropriate green landscaping rather than hard landscaping and hard surfaces.	rain gardens and more permeable surfaces.
9	I have read the information regarding the flood study and firstly would like to say thank you for preparing such a detailed study. I have Honeysuckle Creek running through my back garden. During periods of heavy rain, branches are washed down the creek and become stuck in a bottle neck in the creek where two huge boulders are less than 30cm apart. This directly results in flooding in my garden as the water backs-up the creek. I also have a dead tree laying across the creek (the tree has fallen from council land, it is not a tree from my property.) Can you advise whom in the local council can remove the tree and also if the council would be prepared to widen the gap between the two rocks using a stone cutter/pneumatic drill. (I presume I am not allowed to hire one myself from Kennards and cut the rock myself as it is council property?)	A Council owned drainage reserve adjoins the rear boundary. Debris washed from upstream can be removed by the Council. As this is considered an operational issue, a request has been generated on behalf of the resident for this matter to be investigated. Council will not conduct works (such as the suggested widening of the gaps between the two rocks), resulting to a change in the water course's bed and banks, unless asset stability is seriously threatened (flooding of a garden within the riparian zone is not sufficient cause to undertake these works).
10	There is an anomaly in the location of the stormwater drainage line between Browns Road and Bushlands Ave as shown in figure 8.20 para 8.4.9 . I have attached copy of a Survey shows the actual location of this line and specifically records, "no part of the building is erected over the easement". I feel that it would be to my future interest and for that matter that, of my neighbours if this was corrected. I my opinion the conclusions drawn regarding the problem in Browns Rd should	Figures 8.20 and 8.21 have been amended to show the correct location of the drainage system. The resident's comments in relation to flood flow are noted and appear to be consistent with the flood model.

	still stand. Incidentally I may have been the person who indicated that there had been a surface flow through my front yard, a few centimetre in depth. At times of heavy such has been in evidence a number of times. It has invariably been from water that has come down my side lane from the back yard and through the fence from the house immediately at the rear of my property, which fronts Browns Road. I have NEVER seen water come across my property from Browns Road.	
11	I've been a resident for 20 years now and have observed the changes in the neighbourhood and been an active member in improving the Ku-ring-gai area. I recently received the letter from council in regards to the Blackout Creek Flood Risk Management Study and Plan that aims to prevent and reduce flood impacts in the Blackbutt area. I've reviewed the draft plans and the background information online and would like to present my thoughts. During my time here at my current residence our property has flooded severely twice to a point where I've had to take out flood claims for the loss and damage it has caused our property and contents of more than \$100,000. As mentioned in the plan on page 29, Yarran Street has experienced above-flooring flooding with reports from more than one residence. The Yarran Street reserve is directly connected to my backyard and there is a large drainage pipe that is connected to all the sewers of the surrounding houses. I've written many letters to the council over the years about the poor condition of this drainage pipe that has been blocked and caused severe flooding to my property. The council visits around every 4 months to weed the reserve as part of its maintenance process but fail to remove the excess vegetation leaving the reserve to be a landfill. This has elevated the land in the reserve over the years and the sewerage is becoming elevated with it - causing a slower flow of water	Yarran St hasn't been referred to in the document as having multiple residences effected by above floor flooding, simply that above floor flooding is known to occur at Yarran St. Individual residences haven't been identified. The Study found that this residence does have a major flood risk issue but it was an isolated property in this regard. Hence it wasn't short listed as it was only a single residence found to have an issue and hence was not seen as practical to focus on a flood risk management option in the Study. Further investigation and discussion with the resident will be required to clarify this matter given that potential sewer and stormwater issues are raised. As this is considered an operational issue, a request has been generated on behalf of the resident for this matter to be investigated.

	during heavy downpour. The excess waste and vegetation are also in and around the pipe opening causing it to be blocked with soil and rocks building up from waste. I've had to personally go out and clean the pipe up which is not ideal given this is temporary relief and not a long term strategy with the risk of flooding at an all-time high. This draft needs to highlight specific actions and plans that will be put in place for areas that are at high risk of floods including Yarran Street as already determined by the council. I've suffered financially, emotionally and physically from an old drainage and piping system that is long overdue to be rebuilt and structured. My proposal for the Yarran Street Reserve flood risk is to rebuild the piping area and clear out excess soil and land to re-level the land in the reserve where it can facilitate appropriate water flow that will not cause flooding in the properties. Specific plans and blueprints of this should be developed and included in the draft to target these flood areas.	
12	Having read your Risk Management Study we object to having our property categorized as flow or flood prone or as a "High Flood Island"¹. We have lived here for 12 years and never had flow or flood issues. We have taken approximate measurements and concluded our house floor level is 11 meters above Black Butt Creek's natural water course at the front. From floor level to the top of our block the land rises a further 8 meters at the rear. To categorize our property as a "High Flood Island " is not rational given that the neighbouring property is categorized as "indirectly affected"² which by your own definition means they will not be flooded or cut off. If their property is not flooded how can we be surrounded by water?! Further to this, 2 properties behind us with frontage to Dunoon Ave are included in this "Flood Island" even though they front onto Dunoon Ave where all the other houses are only indirectly affected. For this "High Flood Island" to eventuate the creek would have to rise a conservative 18 meters to cut off the back of our property and even higher to reach all the way to Dunoon Ave which is at a considerably higher elevation	The 2014 Flood Planning area Map identifies this property in the Overland Flow Flood Planning area. This flooding is not in relation to flood waters from Blackbutt Creek reaching the property. The 2014 Flood Study mapping shows overland flow from the drainage system coming from Dunoon Avenue (behind the subject property). As a result, the property is identified as a High Flood Island Emergency response classification for the PMF event. This categorisation is only applicable for the PMF event and that a PMF event is extremely large in magnitude of flooding but extremely unlikely (though still needs to be considered). The property is shown as Indirectly Affected for the 1% and 20%

again. Your own estimation of our house as a "High Flood Island" indicates that we would be surrounded by water and have no access to the road. Even if we couldn't access Bolwarra Ave through our "indirectly affected" neighbour's property, we have direct access to the lane beside our property from our back yard which provides easy access to the top of Bandalong Ave where the houses are only indirectly affected. The notion that we would require resupply by air or boat is frankly ludicrous! We realise this is a draft plan but it seems obvious you have a lot of further work to do. If the objective of the Council is to re-categorize our property among others as flood prone or affected we will use all means available to us to fight it. Should the Council be considering any changes to the classification of our land we ask to be informed in writing in a timely manner. 1 High Flood Island The flood island is higher than the limit of flooding (i.e. above the PMF). The island is surrounded by flood water but there is still enough land available to provide a flood free space for people remaining in the area. This flood free space may not be enough to adequately sustain the population. Properties may or may not be flooded. The area will require resupply by boat or air if not evacuated before the road is cut. Evacuation will have to take place before isolation occurs if it will not be possible to provide adequate support during the period of isolation, if essential services won't be available, or if houses will be flooded. 2 Indirectly Affected Areas There will be areas outside the limit of flooding which will not be inundated and will not lose road access. Never the less they may be indirectly affected as a result of flood damaged infrastructure such as due to the loss of transport links, electricity supply, water supply, sewerage or telecommunications services. They may require resupply or in the worst case, evacuation.	events. The definitions are from the Flood Emergency Response Classification of Communities guideline and have been applied by the consultants according to best practice. The PMF event mapping from the 2014 Flood Study shows flood depths of 0.2-1m around the dwelling and along Bandalong Path and Bolworra Ave in front of the property. This is considered to be deep enough to prevent escape from the dwelling during such an event.
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13	We refer to your letter dated 28 March 2018 advising us of the above study wherein you state that “you are receiving this letter as your property is located within the Overland Flow or Mainstream Flow flood planning areas in the Blackbutt Creek Catchment Flood Study (2014)”. We acknowledge that our property, at which we have continuously resided since 1981 is within the Blackbutt Creek catchment and specifically within the catchment of its tributary, Falls Creek and its tributary “Maitland St Creek” ¹ We have studied the various reports by Council’s consultants Jacobs and GHD and wish to comment as follows. Background We note that the report states “Council sent information letters and questionnaires to residents of 2,395 properties in the catchment during September 2016.” We are unable to recall such correspondence and would be grateful if you would resend it; We are concerned that certain classifications made are incorrect or at least overstated and are potentially detrimental to the value and sale-ability of our property; Those classifications possibly arise because our property is at the margin of areas potentially affected by storm water discharge along the Maitland St Creek watercourse and because the terrain model adopted in Council’s analysis is simply too coarse to pick up the true local manner in which storm water – both in channelled and overland flow form -- is conducted in this location; a key question that we want Council to address is whether the models have been ground truthed by field survey in Maitland St. Council’s studies appear to have been based on data for three locations only, all of which are remote from the Maitland St Creek catchment, being:	Council has record of receipt of a completed questionnaire from the submitter in October 2016 following distribution of information mentioned in the report (Council record number 2016/289076). This will be forwarded to the resident. Ground survey of channel cross sections and other key features was undertaken as part of the 2014 Flood Study, however, due to the expense involved, surveys were limited to channel cross sections and major crossings and consequently the closest area surveyed at that time was downstream of Maitland Street. In relation to the current flood risk management study and plan, as this property was not in a ‘hot spot’ or area for potential mitigation, it was not covered in the visual survey of floor levels. However, as viewed from the street it appears that the floor levels at the front of the property are more than 500mm above the ground. Catchment delineation bisects Regimental Park, but the study does not, as far as GHD or Council is aware, consider any data used to upgrade the reservoir under Regimental Park. Rainfall data used for inflow was published Intensity Frequency Duration (IFD) on a catchment using similar parameters representative of catchments in the area. No storage at Regimental Park has been considered in either the hydrologic or hydraulic models as it is a potable water reservoir, not a flood detention reservoir. There are no other rainfall records from Killara which are suitable for use in the study. We have reviewed the modelled flood behaviour in this area and the residents’ anecdotes are consistent with the modelling. The flood water is isolated to within the front yard of the property and does not appear to affect the residence. Shallow
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• Dumaresq St flow gauging data from MHL in Gordon; • Pymble Pool, in West Pymble; • Sydney Water from their depot on Telegraph Road, Pymble; We are aware that in the early '90s Sydney Water undertook upgrading of the Regimental Park Service Reservoir, which sits at the head of the Maitland St Creek catchment, for a PMF event and would expect that they hold data for that site. Was this checked? It is noted that the following storm events were considered. Of these, that in the late 1980's is, in our recollections, the most severe as is described later herein². Overland Flow and Storm Water Behaviour at the property. Notwithstanding that, since 1981, we may or may not have experienced a 1% AEP or PMF event, at no time since 1981 has storm water been at the depths implied in Council's flood map and furthermore it has not been ponded, because of inflows to our property or from backwatering, as is implied in this figure i.e. up against the front wall of our house; Extract from Jacob SKM Appendix C. Flood Depth Mapping 1% AEP Flood Depths This figure implies that there are two flows – the major one which passes through the front of our property and a lesser one which is within Maitland St. In our experience the reverse is, in fact, correct; Whilst in major storms, there are overland flows through our front garden arising from runoff on our own property and our neighbour's property, these are mostly conducted around our house by paving on both edges to the front garden which is well graded and drained as an overland flow path. At no time since 1981, has there been any problem of water being above floor level -or even remotely near floor level -and entering our house because of these flows,	flow is contained within the Maitland street roadway, where the depth of flow is controlled by the road gutter height. There are no current requests relating to the fill in the front yard. Any previous remediation would have been undertaken based on engineer's advice at the time. Comments in relation to the subsoil drainage issues are beyond the scope of this public exhibition process. In relation to the Aerial imagery and terrain data used for the flood study – the Blackbutt creek flood study was undertaken from 2013 – 2014. The aerial imagery and terrain data (LiDAR) used were the best available at that time and included LiDAR collected in 2007 and Aerial imagery from 2011. These sources are further described in the 2014 Blackbutt Creek Flood Study. There are many site specific issues that can't be addressed through a catchment wide flood study however residents are able to address these through undertaking their own flood study, where required. The front section of your property is shown to be impacted by Overland Flow. As such, the property has been identified as having restricted access during a flood event and is therefore considered as 'High Trapped Perimeter' on the Emergency Classification Response maps, and as 'Evacuation Problems' on the Flood Risk Precinct Map. These maps recognise that an escape to a neighbour's property is likely to be prevented by fencing or other obstacles and residents are likely to be trapped during an event. This is used by the SES and Council to develop appropriate plans for responses during floods. This emergency classification mapping is only intended as a
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which have not exceeded 50mm in depth if that. Some ponding may occur in parts of our garden on the boundary. Most of the flow coming from upstream is contained between the tops of the kerbs in Maitland and within Council's road way – in the very major storm event of the late 1980s, the road was brim full and refuse floated down it. During such event, it has been noticed that, because of our guttering crossing, possible gutter blockages, Council's pit outside the neighbours being blocked with twigs and leaves and the velocity of the flow in the gutter, some street flow jumps out of the gutter and flows over our front lawn and discharges along an overland flow path which continues through the neighbours. This has never exceeded 50 mm in flowing water depth and, other than the one occasion described, caused us to choose not to drive out of our property – even then this lasted less than one hour; The overland flows along Maitland St Creek then enters the open channel via Council's storm water pits and a short section of pipe or by overtopping and running down the drive way of a neighbour – which occurred recently and caused extensive damage to the driveway. Typically, during a very major event, the flow may jump out of the open channel through this neighbour and flood the garage³. While ponding occurs in Warwick St. at the head of Maitland St., this is because of the drainage pit there being blocked or undersized. This part of Maitland St. is too steeply graded for ponding as shown and flows off as described herein. Impact of Neighbours Redevelopment However, there have been changes to the overland flow path, because of redevelopment in Maitland St. In February 2012, we wrote to Anne Seaton of Council, requesting that Council, intercede on our behalf to require the developer to restore the levels in the front garden to what they had originally been because he had effectively built a	guide for flood response considerations and is not for zoning purposes. Notations have been added to the maps to clarify this. Response to 'Actions needed from Council' 1. Installation of detention chambers is considered where appropriate to prevent flooding of residences (this does not include gardens). Council has undertaken such works in the past however they are very expensive and were not identified as a feasible solution in this this flood risk management study and plan. 2. Upgrading of the pipes and pits is an ongoing part of Council's stormwater asset management program; 3. The open channel is contained within private properties ; 4. Council has an existing drainage maintenance program, any problem areas should be reported to Council for maintenance; 5. Any consideration of the driveway and low flow pipe will be considered where an application for development is considered; 6. The catchment scale of the study and expense of the modelling mean that it is not feasible to remodel immediately. Individual topography characteristics are considered for any planning applications; can be communicated to insurance companies; and could be raised during a future revision; 7. There is sufficient information in the current studies to determine the modelled flood height in relating to existing floor level ; 8. Notes have been added to the maps to clarify the
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dam across the overland flow path, which then caused a buildup of overland flow in our front garden and caused our cellar to flood.⁴ At the time I said “As I have predicted in all of my communications with Council, the filling of the overland flow path has caused runoff to pond on the boundary. The fact is that the level is significantly above what it used to be and as result water cannot escape”. While Council, in fact, did act on this occasion and required the developer to remove fill to restore a form of overland flow path⁵, the level in the front garden along the overland flow path is, in our opinion, still higher than it was pre-development and the cross-sectional area of the overland flow path is now smaller. In addition, the developer insisted on a picket fence across the overland flow path, against our recommendation citing compliance with planning approvals, which has the potential to accrete debris in storm event. The impact of higher ground level has had the effect – despite the apparent insertion of some subsoil drainage - of raising the ground water level which has lessened the efficacy of the subsoil drainage that we installed to manage groundwater issues in our property, and which hitherto had functioned well. As a result, we still have some nuisance problems in very heavy rainfall, not experienced prior to this development It is relevant to note that our former neighbour had been there since it was built in 1926 and up till 2012 and, despite her front garden occasionally being partially inundated with flowing or ponded water to possibly 50mm, never reported to us that water had ever reached floor level, which was more than one metre lower than ours. It is also probably relevant to note that the driveway built across the neighbours property in 2012 would now preclude any backwatering effects and – note that the base picture used by Council does not seemingly show this development; Council’s plans also classify our property as being “High Trapped Perimeter”⁶.	purpose and details of these classifications in relation to flood duration and are outlined in section 2 of the report.
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and “High – Evacuation Problems”. We reject those classifications since, as may be seen by visiting the site, we are able to exit our property through a neighbours property at a point which is above even Council’s estimated flood levels. In any event, no flood event, even at the scale predicted by Council, could require “High – Evacuation Problems” – this is not the Hawkesbury River floodplain⁷ but a minor steeply graded catchment where any nuisance flooding of Maitland St and/or our garden lasts at most a couple of hours, if that. Of far greater concern to us, is the possibility of property damage or personal injury, from major limb loss or entire tree fall of the Eucalyptus Saligna on our front boundary⁸ caused by heavy rain and storm winds during a PMF or even a lesser event.

Actions needed from Council

The principal actions that we believe Council should undertake are:

1. Installation of detention chambers to retard peak flows that occur within Council’s assets, for example, roads at the same proportion that Council requires of private owners; for example, at the intersection of Maitland and Warwick Streets.;
2. Upgrading of the piped system and pits from Warwick St and the head of Maitland St to the open channel;
3. Upgrading of the open channel which commences in Maitland St through to Norfolk St and beyond;
4. Regular maintenance of Council’s drainage system to ensure it is not blocked by leaves and twigs from the many major street trees in Council’s nature strip.
5. If the drive way and the low flow pipe installed on the neighbours property are inadequate and liable to cause affluxing into our property, then we request Council require the original developer to rectify this;
6. Reassess this part of the Maitland St. catchment using field survey to inform the terrain model;
7. Amend the plans and records to state that the floor level is not affected

under any of Council's analyses;

8. Amend the plans to remove the "High Trapped Perimeter" and "High – Evacuation Problems" designations or reduce the classification to indicate the likely very short term impact of such events.

Summary

We believe that various designations in Council's report are incorrect or at the very least misleading and potentially deleterious to the value of our property and request that these be reconsidered, for the reasons given above.

This may require field survey to ensure the underlying terrain model is valid and reflects the current circumstances. We are happy to provide access for this.

We request that Council amend its Plans accordingly and after consultation with us.

Thank you for Council's work in undertaking these studies and affording us an opportunity to comment.

We trust these comments are of assistance to Council to make its study as accurate as possible and look forward to Council's further advice.

Footnotes

1 Which is named Maitland St. Creek herein in the absence of any other known name

2 Although it is possible that its apparent severity, in terms of what we observed, may have been caused by blockages in Council's drainage systems

3 This occurs mostly when the drainage easement is blocked by tree fall debris washed out of Council's piped drainage system.

4 While the floor level in our cellar is below the paving level outside, it was above the general ground level that existing in in the lower part of our front garden and the ground level in the front of the neighbours property and hence able to drain.

	5 By email on 19 February 2012 we requested Council provide a survey of this path – Ms A Seaton replied she did not have a survey to show that the overland flow path had been restored. Presumably this means Council did not check that the overland flow path was adequately restored? 6 High Trapped Perimeter: Areas which are partially or wholly above the peak flood level but whose evacuation routes are cut-off. These areas are not surrounded by flood waters but there may be a physical barrier preventing evacuation overland. 7 And it is not even 17 Leeds Place, Turramurra where Peter resided for ten years and which has a major open channel creek line immediately in front of the house and which suffered several storm flows through its garage until he and his father constructed an overflow channel. 8 and which Council has refused us permission to remove.	
14	Thank you for the opportunity to comment on the Draft Report, We have owned the property since October 2000 and have appreciated the creek winding through the front of the property. We have noted that over the years that we the water flow has increased especially during rain. Of course this is anecdotal but I believe our observation have some merit. We also observed, and as reported to the Council on several occasions, that the increase in flow has caused erosion to the creek banks and ripping out vegetation. After a number of complaints to Council, the Council has agreed to maintain the Creek on an annual basis. We suffered two major floods, the last in 2015 causing significant damage. The following Youtube site will serve as evidence of the water flow, over the creek banks and into our property: https://www.youtube.com/watch?v=wB5wOI-UmG8 From my reading of the report I was surprised that: 1) No mention was made on the erosion effects of the floods. These are not	1) Erosion is an important issue considered through the flood risk management process and as part of Council's broader riparian management program. This includes provision of riparian controls in Council's Development Control Plan. Erosion is considered in the report during discussion of planning controls and where it was specifically identified as an issue in the area downstream from the Killara Golf Club dam. 2) There are many issues associated with piping existing watercourses and as such piping of natural, or modified natural watercourses in Ku-ring-gai I is not permitted by Council. This is covered by the Water Sensitive City Policy (2016) and Council's Riparian Land section (Part 17) of the Development Control Plan. The watercourse on the property is covered by Category 3 Riparian Lands mapping which is protected through Council's Local Environment Plan. 3) The review of development impact for the study related to

simply consequential but have, as in our case long term effects to the landscape and future water flows. 2) There was no mention in the recommendations of potential piping open water ways to mitigate property damage in cases of extreme waterflows. Why? In fact there is no mention of open channel water flow studies that feed in to Blackbutt. I strongly suggested to Council to pipe the open channels to prevent floods from the waterways and to also preserve the soil and landscapes. This was rejected on the grounds that they are natural waterways. However this cant be an excuse - many properties, in fact in my case all properties upstream of me, have piped the creek; water levels have risen, development/ sealed landscape has increased in the area and the natural vegetation has changed. They are no longer natural and are in fact altering to cater for the flow increase causing further damage. All these need to be factored deciding on piping "natural" water ways. 3) The effect of development in the area was dismissed with no justification, just simply a brief mention that it wasn't material. What needs to be considered is that the fact that while water from roofs may be drained in to storm water sewer I believe that sealing driveways, landscaping and walkways is allowing water to flow into the street and resulting, in our observed, increase in waterflow. 4) Many of the recommendations made at the end of the report seem to be classified as "Low Priority". What does that mean: nothing should be done? 5) There is no timeframes for the order of actions/ recommendations. I would have thought that it would have been useful to use the consultants to help place some order and time frames for the suggestion in the priority list.	the changes in the catchment that had occurred since the original flood study undertaken in 2014. The recent changes were found to not have a significant impact on the model results. Ku-ring-gai Council has had long established on site detention controls which apply to developments to control run-off during major events. However, this does not necessarily control flows during smaller, more regular events which Council has identified as an ongoing issue. As such, water sensitive urban design, rainwater re-use and other onsite stormwater management controls are included in the water management section of Council's Development Control Plan (see section 24C). Council's Water Smart program also aims to improve water management across the LGA, by providing educational information and rebates for residents to undertake improvement works on their property, such as the installation of rainwater tanks, rain gardens and more permeable surfaces. 4) 'Low priority' does not mean 'no action'. Generally the measures given a 'low priority' have been recommended to be included in Council's ongoing programs as they generally only provide minimal flood impact benefits, based on the number of properties affected. 5) Timeframes are provided for Council to implement recommended measures in Section 9 of the report.
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