

**QUEENSLAND FLOODS  
COMMISSION OF INQUIRY**

**THIRD SUPPLEMENTARY  
STATEMENT OF BRENDAN JOHN NELSON**

I, **BRENDAN JOHN NELSON** of c/- Level 9, 119 Charlotte Street, Brisbane in the State of Queensland solemnly and sincerely affirm and declare:

381. I am the General Manager, Land Use Planning in the Queensland Reconstruction Authority (the Authority). Prior to commencing this role in January 2011, I was the Executive Director, Planning Services in the Office of Growth Management Queensland, in the former Department of Infrastructure and Planning where I was responsible for delivering on both regional and statutory planning for Queensland, planning reform implementation and the delivery of Smart eDA, the State Government's commitment to electronic development assessment.

382. I have been a private consultant, worked internationally and have held various planning positions with Queensland local governments during almost 18 years in planning. I hold a Bachelor of Environmental Science (Griffith) and Graduate Diploma of Urban and Regional Planning (with Distinction) from QUT. I am a Corporate Member and Certified Practicing Planner with the Planning Institute of Australia.

383. I was recently awarded the inaugural Queensland Planner of the Year Award by the Planning Institute of Australia (Queensland Division) on 11 November 2011.

384. This third supplementary statement should be read in conjunction with my original statement to the Commission dated 15 September 2011 (exhibit 538), my supplementary statement dated 21 October 2011 (exhibit 925) and my second supplementary statement also dated 21 October 2011 (exhibit 926).

385. This statement is provided to the Commission as a response to exhibit 970 - *Comments with regard to Statements of Others - Queensland Floods Commission of Inquiry dated September 2011*, authored by Mr Paul Grech and tendered with the Commission on 11 November 2011. I received this document on 14 November 2011 and this was the first time I had seen the comments on the Authority mapping noted by Mr Grech as "QCA Mapping" on page 2 of his draft report.

386. This statement also addresses the evidence of Mr Greg Vann, Mr Steve Reynolds and other matters pertinent to the Commission.

**Mr Grech**

387. I had previously reviewed Mr Grech's statement - *Report to Queensland Floods Commission of Inquiry Addressing Town Planning Issues dated October 2011* tendered as exhibit 966 to the Commission. This report identified at paragraph 5.3 that the "report does not review recent draft

*policies released during the conduct of Commission of Inquiry, such as Temporary State Planning Policy – Planning for stronger, more resilient floodplains and associated Part 1 – Interim measures to support floodplain management in existing planning schemes prepared by the Queensland Reconstruction Authority.”*

388. This third supplementary statement therefore responds to the draft report prepared by Mr Grech in September 2011, with specific reference to paragraphs 3.0 – 6.2 which provide comment on the Authority’s mapping, the Part 1 Guideline and the Temporary State Planning Policy 02/11 (TSPP). Extracts from Mr Grech’s September 2011 draft report and my comments thereon are detailed below.

389. Mr Grech’s draft report – Paragraphs 3.0 and 3.1:

### **3.0 Flood Mapping**

#### **General**

3.1 *MJR (Statement 1, paragraph 21) alludes to the issue as to whether flood maps should be included as a statutory overlay to planning schemes (as a “natural hazard management area” as required by the current legislation) or retained as a non-statutory document, as presently the practice of Brisbane City Council. I agree with MJR that the complexity and extent of such information can make it impractical to include within a planning scheme map. This will be particularly the case if more complex flood risk mapping such as discussed in my Statement is undertaken. In principle, I do not see that it matters, provided that there is a system to ensure that consideration of flood risk, where necessary is triggered. Issues to consider include:*

- *Ease of amendment as new flood information is provided and existing information is reviewed;*
- *Misapprehension that the inclusion of the maps in a statutory document reflects certainty with regard to know flood risk; and*
- *Complexity of information that may be included on a flood map can be disproportionate to the level of information provided on other planning scheme overlay maps.*

390. I agree with Mr Grech to the extent that complex flood risk mapping will lose detail if it is only presented at a macro scale in a planning scheme. It should be noted however that the Authority has addressed this issue through the proposal to prepare both statutory planning scheme overlay maps suitable for inclusion in planning schemes and detailed 1:50,000 scale maps available both on the Authority’s website and in hard copy. Provision of both forms of mapping will aid the continued refinement of the detailed flood mapping whilst providing a statutory overlay map for inclusion in existing planning schemes. I have previously outlined this process at paragraph 229 of my supplementary statement and again in further detail at paragraphs 364 and 365 of my second supplementary statement noting specifically that paragraph 365 states the following – *“The Authority has offered to assist Councils in the refinement of the mapping product including*

*the digital dataset amendments and the production of an overlay may suitable for inclusion in a planning scheme document”.*

391. Mr Grech goes on to state that challenges associated with complex flood mapping do not matter if there is a “*system to ensure consideration of flood risk, where necessary is triggered*”. As outlined at paragraph 95 of my original statement, the Part 1 Guideline is a voluntary toolkit including Interim Floodplain Assessment Overlay (IFAO) maps and the Interim Floodplain Assessment Overlay Model Code (model code). Any Council seeking to utilise the floodplain management toolkit provided by the Authority will have a system which ensures consideration of flood risk can occur, with appropriate triggers.
392. The triggering of a development application using the floodplain management toolkit provided by the Authority will allow the local government to investigate and consider the issue of flood risk and when required, the toolkit will provide the impetus for the local government as the assessment manager to require further flood investigations to be undertaken.
393. The Authority has worked in partnership with the Department of Local Government and Planning (DLGP) to establish a streamlined process for the adoption of new and future flood information. This is established through a minor planning scheme amendment process which is outlined at page 16 and 17 of attachment BJN-10 of my original statement. It is also outlined from paragraphs 228 to 232 in my supplementary statement and again in my second supplementary statement from paragraphs 361 to 366. I also outlined this process in some detail during my evidence on 8 November 2011 (QFCOI Transcript page 4715). I regard the process for adopting the Authority’s floodplain management toolkit and any subsequent amendments as being appropriately streamlined.
394. More specifically, the Part 1 Guideline outlines the process by which a Council may choose to adopt elements of the toolkit including the IFAO mapping and model code provisions as a new “Flood Hazard Overlay- Floodplain Assessment” section within an existing planning scheme.
395. A planning scheme amendment process would normally take at least 6 months including public consultation and state agency review periods. The streamlined process being facilitated by the Authority and the DLGP to adopt the floodplain management toolkit as a minor change to the planning scheme may be undertaken in as little as a few weeks given that the Authority is undertaking the public consultation and state agency review on behalf of Councils.
396. *Statutory Guideline 02/09 – Making and amending local planning instruments (SG02/09)* is included at attachment BJN-26 of my supplementary statement. SG02/09 outlines the process to be followed for a minor planning scheme amendment. Specifically, on page 8 of SG02/09, it is noted that a minor amendment to a planning scheme is an amendment that the “*Minister is satisfied: (b) reflects a state planning policy, or part of a state planning policy*”, noting that consultation has been undertaken on the draft Part 1 Guidelines by the Authority.
397. Included at attachment BJN-44 is a copy of advice from the Honorable Paul Lucas MP, Attorney General, Minister for Local Government and Special Minister of State dated 15 November 2011

confirming that amendments proposed utilising the toolkit provided by the Authority will be deemed to be minor amendments for the purpose of SG02/09.

398. The following 7 steps outline the streamlined process by which a Council can review, resolve and adopt the floodplain management toolkit if they choose to do so.

Step 1: Council obtains toolkit including:

- a) Guideline
- b) Model Code
- c) Mapping
  - i. Hard copy mapbook
  - ii. Digital copy mapbook
  - iii. Digital datasets

Step 2: Council commences review process including the IFAO mapping product and model code provisions.

- a) In reviewing the mapping, Councils are encouraged to utilise existing flood studies, records, photographs and local knowledge to visually inspect and ground truth the IFAO mapping.
- b) Authority officers to visit the Council and assist as required.

Step 3: Council resolves to undertake a minor scheme amendment to either:

- a) Adopt mapping and model code as provided by the Authority unchanged; or
- b) Adopt model code as provided by the Authority and adopt locally amended mapping; or
- c) Adopt mapping as provided by the Authority and adopt amended model code; or
- d) Adopt locally amended mapping and amended model code.

Councils can choose to adopt either of the options or a combination of the above to all planning schemes applicable in their jurisdiction.

During the amendment process to either the IFAO mapping / model code provisions, the Authority can assist Councils in making any refinements.

Where amendments are proposed either under b), c) or d) above, Council should outline the basis for the amendments (ie. based on a localised flood study).

Step 4: In the adoption of the IFAO mapping, the Council will resolve to adopt the mapping as a NHMA (Flood) as provided under the *Temporary State Planning Policy 2/11 (TSPP)*.

Further to this designation, a Council may choose to adopt the mapping or areas of the mapping as Flood Hazard Areas under section 13 of the *Building Regulation 2006*.

Council can also choose to nominate flood levels in accordance with section 13 of the *Building Regulation 2006*. In nominating a flood level, a Council may choose to rely on the highest recorded flood or other historical data if a flood study is not available.

Step 5: Council forwards to DLGP a minor scheme amendment package(s) for each of the planning schemes where amendments are proposed. If the amendment package is proposed under option a) in Step 3 above, DLGP will consider the fast-tracking of the amendment as a minor scheme amendment.

If Council elects to proceed with option b), c) or d) from Step 3 above, DLGP will refer the amendment package to Authority for review.

The Authority will liaise with Department of Environment and Resource Management (DERM) to confirm any amendments or refinements to the IFAO mapping and update the state wide information with the proposed amendments.

The Authority will review any such amendments within 5 business days of receipt from DLGP.

DLGP will then provided to the Minister for consideration, the minor scheme amendment package within 10 business days from either receipt of a package provided under option a) or following confirmation from the Authority that the amendments are appropriate.

Step 6: Council incorporates the approved planning scheme amendments into applicable planning schemes as new sections as either an Overlay Code or Overlay Area depending on the format of the existing planning scheme.

Step 7: Assessment of any new applications triggered in the "Floodplain Overlay Area" against the Floodplain Code.

399. As previously outlined, the Authority has offered to assist Councils in the refinement of the IFAO mapping product including the digital dataset amendments and the production of an overlay map suitable for inclusion in a planning scheme document. An example of this IFAO mapping refinement and mapping production process for the Central Highlands Regional Council is provided at BJNI-45 and discussed further at paragraph 401.

400. The second issue identified by Mr Grech relates to the "*misapprehension that the inclusion of the maps in a statutory document reflects certainty with regard to known flood risks*". I note that section 3.8 of the SCARM No. 73 Report – *Floodplain Management in Australia* notes that "*flood maps are necessarily inexact*" and can be derived from a variety of techniques. This is the case irrespective of whether a Council uses the IFAO maps or flood maps derived from a flood study.

401. The third issue identified by Mr Grech relates to the complexity of information that may be included on flood maps which can be disproportionate to the level of information on other overlay maps. I agree that the level of detail may exceed that shown on other overlay maps, but as outlined above, the Authority is proposing that statutory planning scheme overlay maps be

prepared at the macro planning scheme area level and detailed 1:50,000 scale maps be available to provide additional more complex flood hazard information. The detailed 1:50,000 scale maps will be available both on the Authority's website and in hard copy. Provision of both forms of mapping will aid the continued refinement of the detailed flood mapping whilst providing a statutory overlay map for inclusion in existing planning schemes and will address the concerns raised by Mr Grech. As outlined above, included at attachment BJN-45 is an example of the draft macro planning scheme area flood maps proposed for inclusion in the Bauhinia, Duaringa, Emerald and Peak Downs planning schemes which are administered by Central Highlands Regional Council. The Authority and the DERM have been working with Central Highlands Regional Council in compiling these maps. These maps demonstrate the macro planning scheme floodplain assessment overlays incorporating local government verification. The more detailed 1:50,000 scale maps also incorporating local government verification will be available on the Authority's website and in hard copy once they are adopted into the relevant planning schemes.

402. Mr Grech's Statement – Paragraph 3.2:

***QCA Draft Mapping***

*3.2 Having regard to the substantial absence of existing flood mapping (64% of local government planning schemes contain no flood mapping – BJN Transcript re Statement, paragraph 146) and the enormity of the task of undertaking flood mapping across Queensland, it is recognised that some quick but interim approach would be desirable to trigger where flood risk considerations would be relevant.*

403. The covering letter from Ms Jayne Moynihan, Executive Director of the Queensland Floods Commission of Inquiry to Mr Paul Lack, Assistant Crown Solicitor, dated 11 November 2011 enclosing a copy of Mr Grech's draft report referring to Exhibit 670 (sic 970) states that the draft note prepared by Mr Grech "was prepared without reference to the oral evidence of Mssrs White, Reason and Nelson". I note in paragraph 3.2 of Mr Grech's draft report that he refers to "64% of local government planning schemes contain no flood mapping – BJN Transcript re: Statement, paragraph 146".

404. It would appear that Mr Grech's references above relate to page 2811 of the QFCOI Transcript from 19 September 2011 suggesting that Mr Grech did consider my oral evidence in the preparation of his draft report. The relevant reference from page 2811 of the QFCOI Transcript is as follows:

*"I don't know whether that which you've amended changes the actual numbers or just the percentages, but in paragraph 146 of your statement you say that 63 per cent of local government planning schemes did not contain flood mapping, I take it that's still more or less the right percentage?— Yes, it is. I think the updated figure is 64 per cent."*

405. Notwithstanding this, I note and agree with Mr Grech that a quick and interim approach is desirable to trigger where flood risk considerations are relevant. This is precisely the role and function of the floodplain management toolkit produced by the Authority which includes the Part 1

Guideline, model code and IFAO mapping. Furthermore Mr Grech acknowledges that the Authority mapping process is consistent with the concept of preparing maps identifying flood investigation areas which is outlined in detail at paragraph 10.12 of Mr Grech's statement dated 15 October 2011 (exhibit 966).

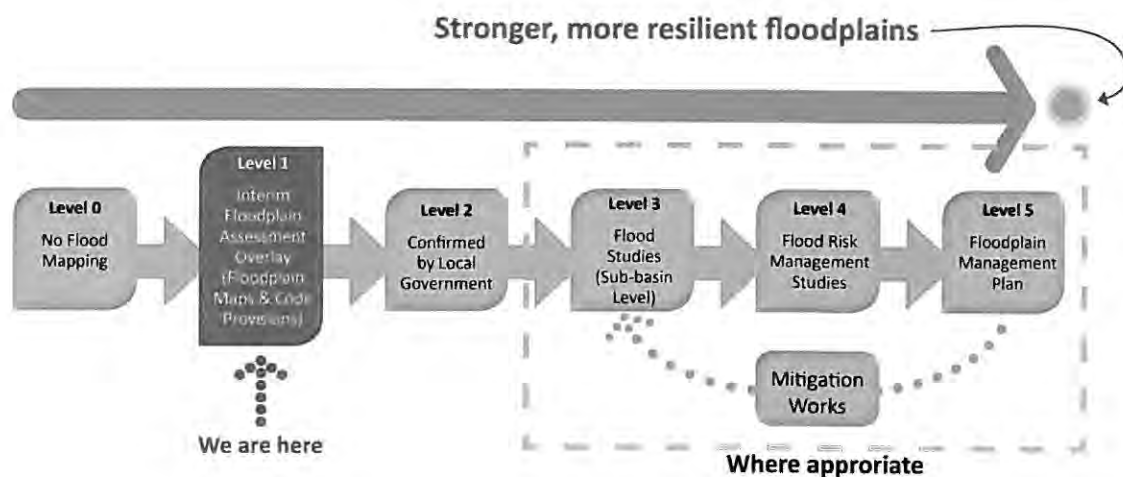
406. Mr Grech's draft report– Paragraph 3.3:

3.3 *The flood mapping undertaken on the State-wide basis (BN Statement, paragraph 99) reflects a rapid assessment technique consistent with the concept of preparing maps identifying "investigation areas", as discussed at paragraph 10.12 of my Statement. That is, in my view such maps can be a useful first step in assisting the consideration of flood risk in the planning process, but should have recognised limitations, being:-*

- *The flood maps need to be clearly recognised for what they present in terms of flood risk information. **Figure xx** provides some comments with regard to the draft mapping available on the Queensland Reconstruction Authority website.*
- *The type of mapping described by BJN (paragraph 99) does not appear to be related to probability mapping (other than where this relates to actual events and their probability is known) and does not relate to flood risk mapping as described in my Statement. The issues arising could be:-*
  - *ultimately if and when more detailed flood mapping based on probabilities (as normally undertaken as part of a flood study) is prepared, it may disprove existing flood mapping or identify areas not previously mapped;*
  - *it excludes other than main riverine flooding (such as major overland flow drainage paths, which could represent substantial flood risks, particularly in more urbanised areas);*
  - *individual development proponents may be able to discredit the flood mapping readily easily, utilising a more conventional flood modeling approach; and*
  - *landowner objections may arise due to concerns with regard to property values and development potential and, as above, be able to disprove the validity of the maps. (Note that this process will identify substantial areas of land as flood-affected across Queensland, not previously identified as such).*
- *For the reasons discussed in my Statement, this type of flood mapping information does not inform the planning process in an ideal way. For example, all areas are identified equally as potentially flood-affected, which does not assist in determining whether there are parts of the floodplain so hazardous that the majority of development should not be permitted, or the relative risk levels within the floodplain that may guide the planned distribution of land uses in a particular way.*

- Without the flood mapping being based on probability modeling, I assume that there would be practical difficulties in determining design flood levels for the purposes of imposing controls on flood levels for different types of land uses, certifying structural soundness of buildings, evaluating flood impacts on others, where a Council does not have design flood levels. As noted at page 17 of the draft Part 1 Guidelines, Council might rely on historical flood data or existing flood studies to determine flood levels for application at the DA stage, but this would not always be available.
- The flood mapping is unlikely to provide a consistent level of flood risk management. This is because the mapping will capture a mix of flood extents based on differing probabilities.
- Such mapping does not provide information on the nature of the flood hazard important in the flood risk management study and plan preparations process (as discussed at paragraph 7.4 of my statement).

407. I note that Mr Grech recognises that the IFAO maps published by the Authority are a “useful first step in assisting the consideration of flood risks in the planning process”. Indeed this is consistent with the flood maturity mapping model that is included on page 9 of attachment BJN-10 of my original statement. This flood maturity model is shown below:



408. This model advances a fit for purpose approach to flood mapping noting the current limited availability of flood mapping in Queensland. The Authority agrees and has maintained that for some areas of the State, high quality information and mapping already exists. However for the majority of the State, this high quality of mapping and information does not exist. It is noted that Mr Grech agrees that it would be unreasonable for this level of mapping to exist for all land within Queensland that is subject to flooding. Further discussion around the reasons and challenges as to why the majority of the State does not have flood mapping is outlined in detail within my original statement at paragraphs 130 to 144.



409. More specifically, the Authority has always maintained that the IFAO maps are not based on a defined flood event, do not represent a Q100 nor a depth, but are a spatial extent based on datasets to determine an area of interest for potential flooding impacts. This is outlined in detail on pages 9 to 11 of attachment BJN-10 of my original statement. This was also outlined extensively in my evidence on 19 September 2011 (QFCOI Transcript pages 2804-2824) and again on 8 November 2011 (QFCOI Transcript page 4706).
410. Mr Grech identifies a number of issues associated with utilising mapping that is not flood risk mapping. One such issue identified by Mr Grech is the fact that more detailed flood mapping based on probabilities may disprove existing flood mapping. It should be noted that this occurs now even with conventional and traditional flood studies and would not be unique to IFAO mapping published by the Authority. As outlined in section 3.8 of the SCARM Report No. 73, flood mapping is necessarily inexact and will continue to undergo refinements and improvements over time. This is consistent with the approach being undertaken by the Authority as I outlined in evidence on 8 November 2011 (QFCOI Transcript page 4710). The IFAO mapping published by the Authority is intended to be dynamic, "so as this better information becomes available, we see that mapping actually being upgraded and improved over time". The Authority has started this process already and the draft flood hazard overlay maps for Central Highlands Regional Council included at attachment BJN-45 are an example of this.
411. In relation to major overland flow drainage paths and urban stormwater drainage paths, I note that the majority of areas where these issues relate are within areas where detailed mapping already exists (ie. Brisbane, Ipswich, Gold Coast, etc). The Authority has not mapped these areas given the extensive existing detailed mapping currently available in these areas. Should this not be the case, and if overland flow is a significant local issue, then the Authority has provide a process that allows Councils to refine the IFAO maps as part of the local verification process outlined in the flood maturity mapping model outlined above.
412. The Authority has always maintained a position that if more detailed information is available, then Councils are strongly encouraged to amend the IFAO maps to ensure that the best available data informs and refines the assessment area. This refinement is discussed further in paragraphs 348 to 354 of my second supplementary statement. The Authority has stated consistently that the IFAO maps do not replace the need for flood studies to be undertaken in appropriate locations.
413. It should also be noted that the draft model code provisions outlined in schedule 1 of attachment BJN-10 of my original statement also deals with maintaining flow paths. In this regard, the IFAO mapping must be considered in context of the entire floodplain management toolkit provided by the Authority and not in isolation as has been done in Mr Grech's draft report.
414. Mr Grech suggests that "*individual development proponents may be able to discredit the flood mapping readily easily, utilising a more conventional flood modeling approach*". In my view, the preparation of flood studies by individual development proponents should not be seen as a potential limitation. Indeed, the preparation of future studies by Councils, landowners and development proponents will lead to a refined and dynamic IFAO mapping product. Further

studies irrespective of who undertakes them will provide an opportunity to refine the IFAO mapping on a statewide basis.

415. In terms of potential landowner objections identified by Mr Grech, it should be noted that as part of the consultation process undertaken by the Authority for the Part 1 Guideline (including the IFAO mapping and the draft model code), 53 submissions were received. A copy of the draft Consultation Report is included as attachment BJN-46. It should be noted that approximately 70 briefing sessions were held across the state with 34 Councils individually briefed during the consultation period. Of the 53 submissions received, 22 were from individual landowners and six submissions raised the issue of property values. Given the process of refinement and local verification provided by the Authority and given the scale and scope of the IFAO mapping, any concerns raised by landowners will be forwarded to the relevant Council for consideration in the verification and refinement process.

416. The notes provided by Mr Grech on his 'Figure xx', can be addressed as follows:

- a) Mr Grech notes that it is "*generally desirable to provide information that is available even if not accurate rather than no information*". I agree that broad scale mapping that undergoes continual improvement and refinement is extremely desirable as a baseline dataset;
- b) An explanation of how to use the Authority's IFAO mapping is shown on <http://www.youtube.com/user/qldra2011#p/u/1/mG7cOV1KSx8>. This YouTube video has had more than 2,400 views up to 29 November 2011. An explanation of how the mapping was derived is available in attachment BJN-10 of my original statement Access to the IFAO Mapping and Part 1 Guideline is available via the Authority's website at <http://www.qldreconstruction.org.au/maps/flood-check-map>. A disclaimer is provided at this website in a prominent position immediately above the "How to Use the Interactive Map" button;
- c) The basis upon which the IFAO maps were developed is outlined in detail in the draft Part 1 Guideline which is part of the floodplain management toolkit provided by the Authority. The draft Part 1 Guideline is included in attachment BJN-10 of my original statement and should be considered in conjunction with the IFAO maps;
- d) I am unaware of the "red dot" referred to by Mr Grech when he clicked on "Affected Communities". The only "red dots" that I can identify on the IFAO map referred to by Mr Grech relate to locality points; and
- e) In the short term, the local verification and refinement process will start to introduce higher quality data including flood hazard data where it is available. The Part 2 Guideline which will be released for public consultation shortly will also start to provide some guidance on how to ensure that any available flood hazard mapping can be incorporated into future land use plans.

417. Mr Grech contends that the IFAO mapping "*does not inform the planning process in an ideal way*". Whilst it would be desirable in the longer term to have access to more detailed flood

mapping, it must always be remembered that flood mapping should be fit for purpose. As Mr Grech outlined in 'Figure xx', it is "*generally desirable to provide information that is available even if not accurate rather than no information*". As I outlined in my evidence on 8 November 2011 (QFCOI Transcript page 4709), the IFAO "*mapping published by the Authority is part of a toolkit. There has been some commentary made recently focussing purely on the flood mapping in isolation of the actual words that support the flood mapping and, really, the words that are in ... the model code ... is an integral part of the toolkit*".

418. The floodplain management toolkit provided by the Authority will provide Councils with tools to assess development applications including seeking further information in areas that may not have been investigated or mapped for flooding previously. This is a significant step forward from the current situation in which approximately 65% of Councils currently have no flood mapping in their planning schemes.

419. For those Councils that don't currently have flood mapping, the IFAO mapping is a first step towards ensuring that floodplain management is considered in the land use planning framework. As previously discussed, Councils are strongly encouraged to locally verify the IFAO mapping using the best available local knowledge, information and flood studies. At paragraph 3.4 of the draft report, Mr Grech acknowledges that an appropriate use of the IFAO maps is for a statutory trigger.

420. Whilst it is well documented that the IFAO maps published by the Authority are not based on probability modeling, I have outlined on numerous occasions about the process that can be adopted by Councils in determining a floor levels for different types of land uses. More specifically, page 17 of the Part 1 Guideline which is included as attachment BJN-10 of my original statement outlines a process for adopting a flood level including utilising historical flood data, existing flood studies and/or topography. The SCARM Report No. 73 recognises that this represents best practice as does the *State Planning Policy 1/03 – Mitigating the Adverse Impacts of Flood, Bushfire and Landslide (SPP1/03) Guideline* (page 35) which states at section A2.21 that "*reductions in the effort and expense of conducting a comprehensive flood study may be available through the alternative flood information sources... These are a compromise between the cost and time involved in a comprehensive flood study and the suitability of information for planning decisions*".

421. I have outlined an example of how a Council may determine floor levels for Goondiwindi at paragraph 235(a) of my supplementary statement and again at paragraph 364 of my second supplementary statement. Whilst Mr Grech is concerned about the lack of available historical data, and whilst it does differ in its quality and age, I am not aware of any sub basins in Queensland that do not have any historical data.

422. Whilst flood risk information will vary across the state in the interim, in my view the withholding of flood mapping until nominated flood risk mapping thresholds are determined poses a greater risk to floodplain management.

423. Mr Grech's draft report – Paragraph 3.4:

*3.4 Accordingly, while the flood mapping program described in the Statement of BJN (and available on the Authority's website) is understandable in the circumstances as an initial step in identifying as quickly as possible, potential areas of flood risk, it seems, in my view, to be more appropriately directed to:-*

- Identifying areas of priority for undertaking more comprehensive flood risk management studies (for emergency management planning as well as the planning process in different area);*
- Providing a statutory trigger where flood issues need to be considered.*

424. I note that Mr Grech accepts that the work of the Authority is "understandable in the circumstances as an initial step in identifying as quickly as possible, potential areas of flood risk". This is the primary purpose of the Part 1 floodplain management toolkit which provides those Councils without flood mapping or planning scheme provisions with an interim toolkit which can be tailored to suit individual Council circumstances and which will afford Councils with tools to assess development applications in areas of potential flood risk.

425. The floodplain management toolkit provided by the Authority will provide a statutory trigger to consider flooding issues for assessable development, and where necessary, will support Councils in requiring consideration to be given to flood related issues as part of any development application, including the provision of flood investigations and/or flood studies.

426. Mr Grech's draft report – Paragraph 3.5:

*3.5 With regard to the second matter, the following issues arise:-*

- The information provided by the flood mapping may not be sufficient to provide a meaningful input to the DA assessment process. Where warranted, due to the scale of development or the sensitivity of the land use being affected by flooding. In cases the mapping could be a trigger to requiring a more detailed flood study.*
- Not all flood-affected land would be identified, nor is it likely or reasonable to expect that all flood-affected land would be identified in the foreseeable future. This is particularly relevant when considering extensive areas that may be affected by overland flow flooding within more urbanised areas. As observed at Section 12 of my Statement, it is desirable to also provide a system that allows for the application of flood related development controls where no mapping exists.*
- I note MJR (Statement 2 paragraph 20) identifies that BBC will require an application to provide a flood study, where not provided with a development application, with regard to detached housing.*
- Similarly, as identified in the Statement of GSW (paragraph 146), an indirect process can be applied to require an applicant to consider flood risks at the DA stage, in the*

absence of a flood map. This process requires the Council assessment officer to identify the potential for flooding and request further information as part of the DA process. It is not clear as to whether this is consistent practice across all Councils in Queensland, and appears to be a "loop hole" process of considering flood risks where not otherwise triggered by a Natural Hazard Management Area overlay in the planning scheme. This process is not clearly reflected within the process described in the Interim SPP Guideline. It would be highly desirable if it did.

- *The flood mapping being undertaken may be misunderstood by the public to indicate that land not mapped is subject to no flood risk. Accordingly, I am of the view that:-*
  - *There should be clear information provided to the public with regard to the purpose and limitations of the flood mapping (other than the disclaimer on the maps) to ensure that there is no misapprehension that they do not necessarily represent all land subject to potential flooding or may even include land not subjected to flooding after more detailed studies are undertaken.*
  - *The flood map extents be broadened as far as reasonably possible to capture what could be later refined to reflect flood extents determined by conventional flood modelling.*
  - *Consideration be given to reflecting the intent of the flood mapping with appropriate terminology, such as describing the floodplains mapped as, "flood investigation areas", as opposed to floodplains. Note: the definition of floodplain within SPP 1/03 would unlikely align with what is being mapped (see paragraph 8.7 of my Statement).*
  - *The flood mapping should not be seen as a long-term fix for identifying and responding to flood risks, particularly in areas where future development may be occurring, which would demand more detailed risk management studies as a priority.*
- *Page 15 of the draft Part 1 Guidelines does appropriately identify a process of Council utilising the QCA mapping as well as relying on an existing overlay or other existing information where this is more accurate.*

427. As a planner with extensive experience as a Council Development Assessment Manager, I disagree with Mr Grech and consider the toolkit provided by the Authority (including IFAO mapping) to be meaningful for Councils, particularly for those (ie. approximately 65%) where no flood mapping or limited planning scheme provisions currently exist. The fact that the floodplain management toolkit provides a trigger for the consideration of assessable development in areas of potential flood risk is a significant step forward for development assessment in Queensland.

428. By way of example, the Central Highlands Regional Council currently has four planning schemes in effect across their local government area. None of these existing schemes appropriately reflect the flood component of SPP1/03. The Council has actively utilised the floodplain management toolkit provided by the Authority. As discussed in paragraph 399 the overlay maps

have been prepared using the IFAO mapping as a baseline and local verification where applicable. The Council has also drafted the scheme amendments for incorporation of the model code provisions into each of the existing planning schemes. The proposed planning scheme amendments for the Peak Downs Planning Scheme are included as an example at attachment BJN-47. The Council is now pursuing a minor scheme amendment and progressing to the Minister for consideration. This process will be completed within 1 month of Council first passing the resolution to utilise the floodplain management toolkit. Following the Minister's consideration, the Council will adopt the amendments within each of their existing planning schemes and have the appropriate scheme provisions and mapping to help inform the development assessment process.

429. Furthermore, based on the feedback received from the recent Council visits, the majority of Councils believe that the IFAO mapping is very valuable particularly for areas where no mapping exists or where there are no current intentions to carry out a flood study.
430. Mr Grech suggests that one of the limitations against using the IFAO mapping is that "*not all flood-affected land would be identified*". Given the limitations associated with conventional flood study mapping, the same limitation will apply irrespective of the standard of flood study mapping utilised. The conventional approach of identifying and mapping a Defined Flood Event (DFE), which is usually a Q100 (1% AEP) will also result in land located between the Probable Maximum Flood (PMF) and DFE, not being mapped. In short, any mapping not up to and including the PMF will have the limitation outlined by Mr Grech. This is not unique to the IFAO mapping in isolation.
431. I note however that recent examples of verification by Councils of the IFAO mapping published by the Authority have indicated that the IFAO mapping offers a high degree of correlation with detailed flood studies. In the case of Gympie Regional Council, I note the evidence of Mr Robert Fredman, Director of Engineering at the Commission on 13 October 2011 (QFCOI Transcript page 4062) wherein he agreed that there was a 95% correlation between the IFAO mapping for Gympie Town Centre and a recent flood study completed by Council. The same has been true in other localities where the Authority has been working with Councils as part of the local verification process.
432. Mr Grech has suggested that it is also "*desirable to provide a system that allows for the application of flood-related development controls where no mapping exists*". This largely describes the existing situation in Queensland where approximately 65% of Council planning schemes contain no flood mapping.
433. Mr Grech makes reference to an indirect process which can be applied "*to require an applicant to consider flood risks at the DA stage, in the absence of a flood map*". Mr Grech is unsure of whether this is a consistent process or a loophole and suggests that it is highly desirable if it were included in the TSPP. In short, the SPP1/03 outlines the process to be applied as part of planning scheme amendment, community infrastructure designation and the development assessment process in Queensland and whilst there is some inconsistency between the provisions of section 5.1 and 6.6 of the SPP1/03, the clear intent and application of SPP1/03 with respect to development assessment is outlined in section 5.1 of the SPP1/03 which states "*until*

*natural hazard management areas are identified in planning schemes, the natural hazard management areas outlined in Annex 3 should be used for development assessment”.*

434. The amendments suggested by Mr Grech are unnecessary for inclusion in the TSPP given that the TSPP is only intended to be used by Councils seeking to amend their planning schemes to incorporate the floodplain management toolkit provided by the Authority. More specifically, the TSPP is not intended to be a tool used for development assessment purposes and has not suspended the provisions of SPP1/03 relating to development assessment. The TSPP is intended to be used as part of the planning scheme amendment process and the SPP1/03 and the amended planning scheme will provide guidance to both the applicant and Council in the assessment of any development applications.

435. Mr Grech correctly outlines that flood mapping can be misunderstood by members of the public. International experience and local experience suggests that this is correct and it is very important to communicate flood mapping in a manner which can be understood by members of the public. It should be noted that the Part 1 Guideline included at attachment BJN-10 of my original statement acknowledges that rarer, bigger floods may fall outside of the IFAO maps. Noting my comments above, even the most sophisticated flood modeling is an inexact science. Like most hazards there will never be an exact line and community understanding and education is paramount for not only flood risk, but for exposure to any natural hazard.

436. In terms of communicating the purpose and limitations of the Authority's toolkit (which includes the IFAO mapping), I note that the Authority has a dedicated webpage located at <http://www.qldreconstruction.org.au/maps/flood-check-map> which identifies in detail the purpose and detail of each element of the Authority's floodplain management toolkit.

437. Mr Grech suggests that the IFAO maps should be *“broadened as far as reasonably possible to capture what could be later refined to reflect extents determined by conventional flood modeling”*. As outlined above in paragraph 431 of this third supplementary statement, current evidence from Councils with whom the Authority has started the local verification process suggests that a high degree of correlation with conventional flood modeling exists. Whilst this is yet to be verified statewide, the approach adopted by DERM in creating the IFAO mapping and which has been outlined at paragraph 98 of my original statement, at paragraph 244 of my supplementary statement, at paragraph 318 of my second supplementary and on page 9 of the Part 1 Guideline which is included as attachment BJN-10 of my original statement. In each of these instances the following principles were outlined for the IFAO mapping created by DERM and published by the Authority:

- a) suitability for a state wide approach
- b) a consistent approach
- c) repeatable if more accurate data is available in the future
- d) evidential and justifiable

438. Notwithstanding the above, the Authority has advised that when better data becomes available, including contour information, further refinements to the IFAO mapping can be undertaken.

439. The IFAO mapping term identified by the Authority was established to identify that the IFAO mapping is 'interim' (subject to local verification and validation), that it represents the state's view of the extent of the 'floodplain' based on a desktop analysis of statewide data sets, and 'assessment overlay' was determined given its accepted nomenclature in Queensland land use planning. Whilst, 'flood investigation area' may be appropriate for some areas of the state, it does suggest that more detailed work is required. In some areas this may be true however in others further investigation including studies are unrealistic due to costs, resources, priorities of a Council and areas of low or no growth.

440. I agree with Mr Grech that the Authority's IFAO mapping should not be seen as a long term fix for high growth areas. Indeed, the majority of high growth areas on the Queensland coast have been the subject of numerous flood studies over many years and there are minimal gaps in flood data in these areas. This is the precise reason why the Authority has not mapped major growth areas such as Brisbane, Ipswich, Gold Coast, etc.

441. The IFAO maps are a baseline mapping dataset and will continue to improve as more information becomes available over time and more detailed inputs are completed. As the Authority has previously stated, these IFAO maps do not replace the need for more detailed risk management studies in appropriate locations. In fact, this floodplain management toolkit helps to identify where more detailed investigations/ studies may be required. Mr Grech acknowledges that "*page 15 of the draft Part 1 Guidelines does appropriately identify a process of Council utilising the QCA (sic) mapping as well as relying on an existing overlay or other existing information where this is more accurate*".

442. Mr Grech's draft report – Paragraphs 4.0 and 4.1:

#### **4.0 Appropriate Development in the Floodplain**

*4.1 Temporary SPP – Planning for Stronger, More Resilient Floodplains, is proposed to amend SPP1/03 by inserting some temporary provisions. The retention of flooding within an overall SPP dealing with natural hazard management in general is desirable at the policy level. Experience has shown that where flood risk management is dealt with separately in the planning process, it becomes a sideline consideration due to the complexity of the issue and time and costs in analysing flood risks, (particularly after long periods of no flooding). Retaining flooding under the umbrella of "natural hazards" also provides perspective that flood risk is only one consideration in the planning process.*

443. I agree with Mr Grech in that it is appropriate to retain flooding under the umbrella of natural hazards to provide perspective that there is more than one hazard that needs to be considered in the planning process. The TSPP retains this objective and only suspends part of the existing SPP1/03. It should be noted that the TSPP commenced on 14 November 2011 and a temporary state planning policy is not required to undergo public consultation.



444. Mr Grech's draft report – Paragraph 4.2:

*4.2 SPP 1/03 requires both a flood study (to identify flood behaviour characteristics) and a floodplain risk management study (which identifies risks and potential mitigation options including planning controls) leading to the preparation of a flood risk management plan. As noted at paragraph 94 of BJN Statement, Part 2 of the Guideline is yet to be prepared and is to include a "flood study template". It is not clear what this means. The flood risk management process outlined in SPP 1/03, involves a process with significant community input to determine acceptable flood risks (see Figure 2 of my Statement) which goes beyond what is described as a flood study in the SPP.*

445. Mr Grech discusses the *Part 2 Guideline – Measures to support floodplain management in future planning schemes*. This Guideline is nearing completion and will be released for public consultation shortly. A copy of the draft Part 2 Guideline will be made available to the Commission following its release for public consultation.

446. The following framework provides a general overview of the draft Part 2 Guideline:

<b>INTRODUCTION</b>	Journey towards improved flood consideration in the land use planning process Re-iterate part 1 Flood Mapping maturity model Part 2 purpose to ensure flood is considered in future planning schemes including flood guidance
<b>UNDERSTANDING</b>	Deliverables of Part 2 1) Flood Guidance 2) Land Use Transition 3) Code Provisions Reiterate the Floodplain Management System Chance/ Consequence Fit for purpose approach Terminology and Language in a Planning Scheme
<b>ANALYSIS</b>	Fit for purpose flood guidance <ul style="list-style-type: none"> <li>• Flood Investigation</li> <li>• Flood Study (level 2 and 3)</li> </ul> Role of Land Use Planning in reducing impact of flood (Case Studies including Clermont) – What should planners know about flood?
<b>IMPLEMENTATION</b>	Planning Evaluation – bridging the gap between flood guidance and planning schemes Actions (status quo, retreat, back-zone etc) – Land Use Strategies Planning responses – Strategic Framework, Zoning, Overlay – Refer to Schedule
<b>DELIVERY</b>	Checklist for using guidance Using the schedules Result – Next planning scheme considers flood in the context of the LGA – fit for purpose

	Case Study example – how to use Part 2.
<b>SCHEDULES</b>	<ol style="list-style-type: none"> <li>1. FLOOD GUIDANCE</li> <li>2. FLOOD INVESTIGATION – Level 1 step by step</li> <li>3. QPP GUIDANCE a) Strategic Framework b) Zoning and c) Overlay – include template maps where appropriate</li> </ol>

447. Mr Grech goes on to make reference to the fact that SPP1/03 requires both a flood study and flood risk management study leading to the preparation of a flood risk management plan. What Mr Grech hasn't outlined in his draft report is that the SPP1/03 Guideline at page 35 provides an outline of flood study alternatives which are a reduction in the effort and expense of conducting a comprehensive flood study and which may involve the use of historical flood data, existing flood studies and topography. This is consistent with the alternative forms of flood studies outlined in the Part 1 Guideline and the fit for purpose approach being recommended in the draft Part 2 Guideline. In this regard, the Authority's approach is consistent with SPP1/03.

448. Mr Grech's draft report – Paragraph 4.3:

*4.3 The development scheme described for the area affected by flooding on 10 January 2011 (paragraph 59 of BJN Statement) understandably cannot remove development rights for existing residents without compensation. I make my comments on the assumption that there has been considerable debate as to whether to allow the redevelopment of properties that were badly affected in the recent floods and that options involving compulsory acquisition with appropriate compensation were rejected. I assume that adequate information is available to reasonably understand that possible flood hazard across a range of flood at the individual property and a conscious decision can be made by the approval authority and the land owner about the level of risk associated with rebuilding. These are clearly difficult and complex considerations but without a reasonable understanding of the risk it may be prudent to defer decisions until appropriate information is available.*

449. Mr Grech now makes comment on the Grantham Development Scheme and specifically the scheme's direction to discourage further residential development in areas where there isn't a specific understanding of the possible flood hazards across a range of floods. Full details of the process that emerged at Grantham is outlined at paragraphs 5 to 78 of my original statement. Further information is provided in relation to the Grantham Development Scheme at paragraphs 177 to 210 of my supplementary statement.

450. Specific discussion on the preparation of the Grantham Development Scheme including the role of the scheme in discouraging some land uses and the adoption of interim flood levels is provided in detail at paragraphs 55 to 78 of my original statement.

451. I do not agree with Mr Grech's suggestions that it may have been prudent to defer decisions about Grantham until appropriate flood information was available. The Authority developed a very good understanding of the historical context of Grantham noting that the town had flooded 15 times previously between 1843 and 2011 and that the land subject to the Council's land swap program was not flood effected. The Authority working in partnership with Council led a program

to ensure that Grantham was rebuilt to be resilient to any future flooding events, and was rebuilt as quickly as possible to enable some residents to be in their new homes prior to Christmas 2011.

452. The Lockyer Valley Regional Council has commenced the preparation of flood studies to understand the scale and scope of the January 2011 flood event in Grantham. Waiting until this work was completed would not have enabled the Authority to efficiently and effectively support the reconstruction of Grantham in a timely manner. Further, it would not have been acceptable to members of the community who were seeking to reestablish their lives as quickly as possible.

453. Stage 1 of the Grantham Reconstruction Area will be officially opened on 10 December 2011; just 11 months after the January 2011 flood and the first two dwellings are expected to be completed prior to Christmas 2011. This would not have been possible had decisions on Grantham been deferred until after the completion of the relevant flood studies.

454. Mr Grech's draft report – Paragraph 4.4:

*4.4 Redevelopment in badly affected locations is said to be discouraged by requiring it to be impact-assessable development. However, there are minimal definitive Acceptable Outcomes in the Interim Floodplain Assessment Overlay Model Code that apply when undertaken such an assessment, particularly where there is limited flood behavioural information. For example, in determining an appropriate defined flood level, would this to be determined solely on the historical flood height, or will it be based on more standardised probability flood modeling? Would the structural adequacy of the building and evacuation capacity of future residents be considered? Such assessments may require information such as flood depths, velocities and rates of rise across a range of floods. Any lack of certainty with regard to what level of flood risk is being addressed, should ideally be clearly disclosed to residents that intend to rebuild.*

455. It would seem that Mr Grech may be confusing the role of the Part 1 Guideline and model code and the direction taken by the Grantham Development Scheme to set levels of assessment relative to the new land zones. It is unclear where the statement "*redevelopment in badly affected locations is said to be discouraged by requiring it be impact-assessable development*" has come from.

456. As I outlined in paragraph 106 of my original statement, the Part 1 Guideline was not intended to set any new levels of assessment for a particular development. However, as nominated on page 15 of the Part 1 Guideline, Councils wanting to change levels of assessment can do so. The use of the IFAO mapping in isolation to set levels of assessment is not the intention of the Part 1 Guideline. The proposed Part 2 Guideline will look to provide further guidance to Councils in the consideration of flood hazards within their future planning schemes.

457. In relation to the Grantham Development Scheme, it was developed prior to the Part 1 Guidelines and as outlined at paragraph 67 of my original statement, the Grantham Development Scheme is the first *Sustainable Planning Act 2009* (SPA) compliant local planning instrument in

Queensland and has been prepared using the *Queensland Planning Provisions – version 2.0* (QPP).

458. As outlined in paragraphs 75 to 78 of my original statement, while preparing the Grantham Development Scheme, consideration was given to SPP1/03. The principles of SPP1/03 are reflected throughout the Grantham Development Scheme. Specific details of this include:

- Any proposed development identified in the Gatton Planning Scheme's Potential Bushfire Risk Area Overlay and the Steep and Unstable Land Overlay will continue to require assessment against the Overlay Codes in the Grantham Development Scheme; and
- The land use plan within the Grantham Development Scheme has been prepared with direct consideration of the extent of the 10 January 2011 flooding events:
  - Provisions in the Low impact industry zone, Local centre zone, Limited development (Constrained land) zone codes reflect that where practical, essential services are elevated above the defined flood level;
  - The nomination of a defined flood level as assessment criteria for uses proposed within the affected area; and
  - Designation of new residential land outside of the area impacted by the 10 January 2011 flooding event.

459. The Lockyer Valley Regional Council is currently preparing its new SPA compliant planning scheme which will require consideration of SPP1/03 in the preparation and making process as required under SPA. To help inform this process, the Council is also undertaking a flood study which will be one of the studies used to inform the new SPA planning scheme and to also identify final defined flood levels particularly in areas impacted by the 10 January 2011 flooding event.

460. The Grantham Development Scheme requires the 'defined flood level' for the land use plan to be determined by Lockyer Valley Regional Council having regard to the flooding on 10 January 2011. Council may initially adopt an interim level and final level following further studies.

461. The existing Gatton Planning Scheme has been identified as appropriately reflecting bushfire and landslide matters from SPP1/03. The reliance by the Grantham Development Scheme on these existing provisions of the Gatton Planning Scheme ensures that with respect to bushfire and landslide, the Development Scheme appropriately reflects the SPP1/03. In relation to flooding, it is noted that the existing Gatton Planning Scheme does not appropriately reflect SPP1/03. Given the flood studies currently being prepared by Council, the Development Scheme provides for Council to adopt a 'defined flood level'. The allocation of land uses in the Development Scheme was undertaken to ensure that all new residential lots were located above the 10 January 2011 event which is acknowledged as being an extreme event.

462. Mr Grech's draft report – Paragraph 4.5:

*4.5 At paragraph 72, BJN notes that the design of the Scheme for the future Grantham Township is directed to both rebuilding the community and "limiting the potential for future*

*redevelopment in areas affected by the January 2011 flood event". I have not at the stage, seen any information that explains the probability of that flood and the range of possible floods that could occur within that floodplain. While I am not critical of the need to act swiftly to rebuild the community, it does not appear clear to me that the residual flood risks that the rebuilt township will be exposed to, have been identified and communicated to the public. Some explanation is provided at paragraph 76 of the BJN Statement, however this implies that a "flood study" will be prepared in the future, to inform the SPA-compliant planning scheme being prepared by the Lockyer Valley Regional Council, but assumingly this information is not available. I note the reference is to a flood study as opposed to a floodplain risk management study as specified in SPP 1/03, but assume that this is just short hand.*

463. As outlined above, Council are undertaking a flood study to understand the risks associated with rebuilding in the Lockyer Creek sub basin. It should be noted that all affected residents were eligible to participate in the land swap agreement with Council to relocate to flood free land to the north of the existing town. Those residents electing to take part in the land swap will not have any residual flood risks on their new lots. Provisions have also been included in the Grantham Development Scheme for those wishing to remain in the flood affected area to ensure that any new buildings take account of future flooding events.

464. Mr Grech's draft report – Paragraphs 5.0 and 5.1:

#### **5.0 Appropriate Minimum Standards for Development in Flood Prone Land**

*5.1 MJR (Statement 1, paragraph 9) indicates that existing flood-related planning restrictions "reflect policy judgments" about what is an acceptable level of risk. However, the flood risk management process outlined by SPP 1/03 and that SPP Guideline requires that these judgments be made through a process involving substantial community input and a more comprehensive understanding of flood risks than has been available in the past. It is recognised that this policy is relatively new and Councils are currently going through a process of renewing planning schemes under the provisions of the Sustainable Planning Act 2009.*

465. Whilst I agree with Mr Grech that community input is required in determining flood risk standards within a community, it should be noted that there is substantial community engagement involved in the making of a new planning scheme, as prescribed by the process set out in *Statutory Guideline 02/09 Making or Amending Local Planning Instruments (SG02/09)* (a statutory guideline under the *Sustainable Planning Act 2009*). Given the current circumstances in Queensland whereby the majority of local governments are preparing their new SPA planning schemes, it is relevant to consider the substantial consultation that will occur as a part of this process which should include community input on any flood studies undertaken by the local government. This will help ensure that a disconnect does not occur between the flood study and any new SPA planning schemes.

466. If a flood study is being undertaken separately to the preparation of a new SPA planning scheme, I agree with Mr Grech that community input would be expected to occur in relation to the flood study.

467. Mr Grech's draft report – Paragraph 5.2:

5.2 *The performance outcomes and acceptable outcomes at Clause 4 of Schedule 1 (Interim Floodplain Assessment Overlay Model Code) of the Part 1 Interim Guidelines provide understandable interim controls. However, they raise the following issues:-*

- *Generally, the controls capture the seven considerations typically applied to development, outlined at paragraph 16.3 of my Statement, but not necessarily comprehensively.*
- *Providing elevated structures in conjunction with the need to provide “clear and direct pedestrian and vehicle evacuation routes off the site” can be conflicting risk management measures. If an occupant wrongly assumes that the elevated structure will not be inundated, there can be a propensity to remain within the building past the point where evacuation is possible. This can be dangerous where flood levels could continue to rise to life threatening levels or if the dwelling could become structurally unstable.*
- *Some terms are ambiguous. For example, Performance Objective 5 requires community infrastructure to function effectively during and after “flood events”. It is not clear whether this means all flooding (i.e. up to the PMF, if known).*
- *Performance Outcome PO3, which requires consideration of impacts upon others on the floodplain, does not identify the need to consider cumulative impacts. That is, the impact of an individual development will inevitably be minor, compared to the impact associated with all developments contemplated by planning scheme. Consequently, without considering cumulative impacts, the additional flood affectation to existing development could, over time, be substantial.*
- *The controls in the Interim Code are structured to be implemented in a practical manner, where little or no flood behavioural information exists. However, I do not see a reason why there should not be an alternate set of more detailed standard controls that could apply where existing detailed flood behaviour information exists, or is warranted to be provided in the DA process by way of a site-specific flood study, due to its scale (e.g. a major residential development of 100 dwellings or more) or because of its sensitivity to flooding (e.g. a hospital or aged persons accommodation). Such more detailed interim guideline could also be useful in Greenfield planning. For example, rather than require buildings to be “located on the highest part of the site” (Cl.4.AO1.1) the Acceptable Outcome could be to be located on land above the Q100.*

468. It should be noted that the provisions in the draft model code were based on the principles of SPP1/03, with particular reference to the specific outcomes in Annex 4, section A4.2 of SPP1/03. The model code was also drafted having regard to existing local planning instruments in Queensland with existing workable provisions relating to flood mitigation (such as Brisbane City Council's Temporary Local Planning Instrument 1/11 and the Rockhampton City Plan) as well as

input from the DLGP (including Building Codes Queensland) and the Department of Community Safety.

469. Mr Grech notes that the provisions of the model code generally, but not necessarily comprehensively, deal with the seven considerations for controls in relation to development in a floodplain as highlighted in section 16.3 of his statement dated 15 October 2011 (exhibit 966). The seven considerations highlighted by Mr Grech include:

- a) Site and Floor levels
- b) Building components and method
- c) Structural soundness
- d) Flood affectation
- e) Car parking and driveway access
- f) Evacuation; and
- g) Management and design

470. Firstly, I note that a number of Mr Grech's considerations relate to building matters (including building components and method, and structural soundness), which are not intended to be dealt with in planning schemes in Queensland. Such building matters are to be considered through the building assessment provisions and therefore were not included in the model code, nor would it be appropriate in my opinion to include them in the model code.

471. Secondly, the model code was drafted to ensure that it could be a useful tool for each local government across the state, so this meant that it was not necessarily appropriate to provide detailed provisions in the model code. It was always intended that Councils could provide additional more detailed input during the adoption process. In this regard, I refer to paragraph 229 (step 3) of my supplementary statement and paragraph 364 (step 3) of my second supplementary statement. This process provides that:

Step 3: *Council resolves to undertake a minor scheme amendment to either:*

- a) *Adopt mapping and Model Code as provided by the Authority unchanged; or*
- b) *Adopt Model Code as provided by the Authority and adopt locally amended mapping; or*
- c) *Adopt mapping as provided by the Authority and adopt amended Model Code; or*
- d) *Adopt locally amended mapping and amended Model Code.*

*Councils can choose to adopt either of the options or a combination of the above to all planning schemes applicable in their jurisdiction.*

*During the amendment process to either the mapping / code provisions, the Authority can assist particularly the low-growth Councils in making any refinements.*

*Where amendments are proposed either under b), c) or d), Council should outline the basis for the amendments (ie. based on a localised flood study).*

472. Finally, I note that providing such detail in a tool intended to be used by Councils in Queensland with significantly differing circumstances is likely to have limited the relevance and workability of the floodplain management toolkit and prevented it from being utilised across the State. It was considered more appropriate to supply the base tool (which is generally consistent with Mr Grech's planning considerations for development in a floodplain) and then provide adequate support to local governments in localising the model code to ensure that it is fit for purpose.
473. I do not consider that the model code promotes a potential danger associated with elevating buildings and direct evacuation routes. At no point does the model code or the Part 1 Guideline suggest that it is appropriate for members of the community to remain in their home during a flood event if the building they occupy is elevated. In support of this position, I note that the Part 1 Guideline specifically states at page 4 that *"Critically, it (the toolkit) also does not replace or diminish the need for disaster warning and response plans or evacuation procedures. Even after adopting the recommendations in this Guideline, people should not become complacent to the risk of flood."* Additionally, the case studies provided in the Part 1 Guideline that comply with the model code each promote simple and direct evacuation routes off site.
474. In relation to Mr Grech's comment about the ambiguity of Performance Outcome 5 relating to community infrastructure, I note that this provision was specifically drafted in this manner to cater for the varying degree of regulation that applies to different types of community infrastructure. The SPP1/03 Guideline provides guidance on the recommended flood level (RFL) for certain types of community infrastructure (ie. emergency services 0.2% AEP, emergency shelters 0.5% AEP, police facilities 0.5% AEP, hospitals 0.2% AEP and substations 0.5% AEP). Additionally, the SPP1/03 Guideline states that if community infrastructure is located below the RFL and that it can function during and immediately after a RFL flood event, then the siting may be acceptable. It should be noted that Performance Outcome 5 was drafted based on SPP1/03 and the SPP1/03 Guideline and allows for local governments to ensure that community infrastructure is designed to withstand the varying recommended flood events.
475. I do not agree with Mr Grech's point that Performance Outcome 3 of the model code does not identify the need to consider cumulative impacts. Performance Outcome 3 states that *"development directly, indirectly and cumulatively avoids any significant increase in water flow, velocity or flood level, and does not increase the potential for flood damage either on site or on other properties"*. I would contend that the very nature of Performance Outcome 3 is to ensure that the Councils as the assessing authority considers the impacts of the proposed development on others which therefore includes consideration of the cumulative impacts of development.
476. In response to Mr Grech's proposal that there should be an alternate set of provisions that could apply to areas where detailed flood information exists, I note that the floodplain management toolkit is not intended to replace more detailed information where it currently exists. Rather, it is intended to provide an interim solution for those existing planning schemes that do not currently include detailed flood mapping and/or provisions. Furthermore, it is noted that each existing planning scheme in Queensland is different and therefore the floodplain management toolkit was prepared in a format to ensure ease of adaptation for each planning scheme area.



477. Additionally, I refer to the Authority's work in the draft Part 2 Guideline which will provide local governments with detailed guidance on how to effectively deal with flooding in their new SPA planning schemes. The Part 2 Guideline will provide an explanation and examples for Councils about how to consider flooding in the Queensland Planning Provision (QPP) framework, more specifically through the strategic framework, efficient zoning designations and the use of precincts as well as the Flood Hazard Overlay. Therefore, as Councils continue to increase the maturity of their flood information, the Authority has ensured that detailed planning guidance will be available to support Councils in the implementation of long term flood mitigation in new SPA planning schemes.

478. Mr Grech notes that more detailed guidelines could be useful in greenfield planning and making reference to development being located on land above the Q100. At the outset, I note that the Part 2 Guideline will provide Councils with strategies that do not require the sole use of Q100 as it is recognised that this information may not be available at a local level across the entire state. Rather, the Part 2 Guideline will provide a detailed planning evaluation method, whereby Councils are stepped through the process of assessing the flood hazard to then inform land use transition strategies that respond to the flood risk in their new SPA planning schemes.

479. More specifically, the Part 2 Guideline will assist Councils in determining the appropriate measures to be implemented in their new SPA planning schemes to support the adopted land use strategies. For example, if a local government intends for broad hectare development to avoid flood risk areas, then the Part 2 Guideline will provide guidance on how best to ensure this through the QPP framework, being through the strategic framework and considered zoning designations to ensure that broad hectare development occurs in the intended areas.

480. Mr Grech's draft report – Paragraph 5.3:

*5.3 Notwithstanding the above specific comments, there should be some consideration given to whether any development should be permitted on flood prone land generally and more specifically the land affected by the 2010/2011 floods, without basic knowledge of flood behaviour such as the depth of flooding at the Q100 and more extreme floods. There can be a conscious decision to allow development without such information but this in itself needs to be accepting of the risk that without such information similar or more extreme flooding could have devastating impacts in the future.*

481. Given the limited amount of flood mapping currently available in planning schemes across Queensland (as outlined in attachment BJN-13 of my original statement), and given the timeframe for undertaking flood studies and preparing new SPA planning schemes, dismissing the Authority's mapping and model code on the basis of lack of hydraulic/hydrological information will in my view increase the risk that future development may occur without appropriate review. It may also result in new SPA planning schemes being prepared without baseline floodplain management provisions. The Authority's floodplain management toolkit ensures that in areas where little or no flood information currently exists, assessing authorities can use the mapping to indicate areas of potential flooding which can then trigger further consideration of flooding in relation to assessable development.

482. In this sense, the floodplain management toolkit will reduce the risk of inappropriate development and built form occurring in floodplains across the state. For this reason, and the various other reasons that I have provided in my statements, the Authority's floodplain management toolkit should not be dismissed due to its relevance and immediate benefit in lieu of more detailed information.

483. Mr Grech's draft report – Paragraphs 6.0 and 6.1:

**6.0 Use of Building Codes in the Floodplain for Existing and Future Development**

*6.1 MJR (paragraphs 175-181) confirms that there are presently no specific building codes for flood-prone area in Queensland, other than the setting of minimum heights for habitable rooms. Mr White, nonetheless, confirms that the Queensland Government is pursuing the adoption of National Building Codes through the Australian Building Codes Board. Mr White anticipates that the new mandatory part of the draft Standards could be introduced into Queensland for buildings in a designated flood hazard management area by late 2011. I have not viewed this draft Standard, but assuming it covers an appropriate range of building elements, then this would be a desirable outcome; if not then there may be a need to consider a supplementary interim building code.*

484. Mr Grech has not noted that the Building Code of Australia (BCA) currently requires all buildings to be designed to withstand the combination of loads and actions to which they may reasonably be subjected (including flood waters). As a result of this, designers and engineers are currently required to ensure that buildings will withstand loads and actions of floodwaters. However, there is no current detailed guidance and information on how to do so. Based on this understanding, the amendment to the Queensland Development Code (QDC) to include the draft national standard is supported as it will ensure that there will be greater guidance for industry and the community about how to appropriately design buildings in flood affected areas.

485. It is noted that the amendment to the QDC will also involve requiring utilities to be placed above the flood hazard level or designed to be more resilient to the impacts of flood. This aspect is also supported due to the significant issues associated with the flooding of utilities, for example electrical equipment such as switchboards, as occurred in the recent Queensland flooding events. The Authority's Guideline '*Planning for Stronger more resilient electrical infrastructure*' made specific reference to this aspect of the proposed QDC amendments and highlighted support for this outcome.

486. The Authority is supportive of the amendments to the QDC as they are not considered to impact on the ability to build certain uses in particular areas, meaning that local governments will retain responsibility for making important land use decisions through planning schemes and through the development assessment process. It is considered that the QDC amendments will ensure that in future, the building and planning processes in Queensland will be able to complement each other in relation to flood mitigation for new development through a structured and transparent framework.

487. Mr Grech's draft report– Paragraph 6.2:

*6.2 I note that such additional Building Code requirements are likely to have a construction cost implication and accordingly, the extent of development to which the Code is applied may be the subject of debate.*

488. It is considered that the proposed QDC amendment, through providing further guidance on the requirements of how to build appropriately in a flood affected areas, may in some circumstances reduce the need for expert reports or additional studies in the building approval process in order to meet the BCA requirements. The QDC is proposed to provide greater guidance for industry and the community about how to appropriately comply with the BCA requirements for buildings in flood affected areas.

489. This statement gives no consideration to the costs associated with buildings that are not built to the appropriate standards on individuals, the insurance industry or the community.

490. At the outset it should always be remembered that for the QDC amendments to be effective, Councils need to resolve under section 13 of Building Regulation 2006, irrespective of whether they adopt the IFAO maps and model code in their existing planning schemes.

**Mr Greg Vann**

491. I note that Mr Vann made the following comments in support of the Authority's floodplain management toolkit when giving evidence to the Commission on 11 November 2011:

- a) Mr Vann agreed that the clear intention and purpose of the Authority's work was to assist Councils, with little resources to do flood studies and their own mapping, to adopt the IFAO mapping in conjunction with the model code provisions and place these tools into their existing planning scheme to address the issue of potential flooding impact (QFCOI Transcript Page 4994).
- b) When asked if he considered the Authority's work to be a useful starting point, Mr Vann stated *"Yes, look, I think it's great that someone is having a go at trying to very quickly provide, you know, a very wide coverage of mappings. I think one of the really important steps that I get from reading the Guideline and also from Mr Nelson's evidence is that local governments really need to kind of come to the table and be satisfied that they're either okay with the line as it stands or they have sufficient understanding of the local situation, even if they haven't done the flood mapping to be able to vary that line to what they consider to appropriately effect areas that might want a catcher"* (QFCOI Transcript Page 4995).
- c) When asked if he considered whether the Part 1 Guideline made it clear that the floodplain management toolkit was a basic toolkit which is intended to be added to with local knowledge overtime, Mr Vann responded *"Yes"* (QFCOI Transcript Page 4995).
- d) Mr Vann noted the importance of consistency in an approach to dealing with flooding in planning schemes and that the Authority's work ultimately provides a consistent database (QFCOI Transcript Page 4995).

- e) Mr Vann agreed that, in terms of consistency, one of the advantages of the Authority's IFAO mapping is that it maps across all catchments statewide and that generally, notwithstanding some reservations about the details of the maps, it is clearly a preferred approach to understanding flooding at a catchment level (QFCOI Transcript Pages 4995 and 4996).
- f) Mr Vann noted the importance of assessing the risk of flooding in urban areas and towns having consideration to the wider catchment, referring to the example of the need to consider future development of Brisbane in the wider catchment context (QFCOI Transcript Page 4996).
- g) Mr Vann also noted that the Authority's work is "*a step along the way towards that (best practice), I guess, if the information is appropriately founded and appropriately used.*" (QFCOI Transcript Page 4996).

492. Mr Vann identified the links between the statewide approach to bushfire mapping previously employed in Queensland and the potential for the Authority's mapping to similarly act as a baseline statewide dataset for floodplain mapping (QFCOI Transcript Page 4995).

493. I agree with Mr Vann's comment and note that the Authority's mapping is intended to provide that baseline data to be further verified and improved at the local level, as has recently commenced in a number of Councils across Queensland.

494. In giving evidence, Mr Vann did raise a concern about not having a clear indication of what the Authority's mapping represents as it does not align with a particular event such as a percentage AEP or a Probable Maximum Flood (QFCOI Transcript Page 4994). Mr Vann then went on to note the potential associated impacts of imposing an unnecessary burden on a large number of people who wouldn't otherwise have to deal with the issue and where there is not a significant risk (QFCOI Transcript Page 4994). I agree with Mr Vann that the approach to flood mapping needs to be fit for purpose.

495. The identification of the IFAO mapping will enable those local governments with little or no detailed flooding information to have a baseline to work from. Again, I reiterate that that the local verification process is in place to allow Councils, with the greatest understanding of local historical flooding information to ground-truth and locally verify the information to ensure the planning trigger applies to the relevant areas.

496. I am also of the view that the model code, once triggered through an overlay system will not impose an unnecessary burden on the community or industry. Rather, the provisions raise a number of important issues to be considered through the development assessment process to ensure that, where appropriate (based on the locally verified mapping), flooding is adequately considered in any new development.

**Mr Steve Reynolds**

497. In reviewing the evidence of Mr Reynolds (QFCOI Transcript Pages 4957 and 4962), I note that Mr Reynolds made the following comments: "...*That caused me to go back to the model code, which is in the temporary State Planning Policy...*" and "...*'Contemporary' [sic] State Planning Policy Model Code...*"
498. The terminology used by Mr Reynolds to describe the relationship of the model code prepared by the Authority as part of the floodplain management toolkit is not correct. For clarity, the model code is provided within the Authority's Part 1 Guideline which is supporting material to the TSPP. The model code therefore does not form part of the TSPP.
499. Mr Reynolds' terminology may give the Commission an incorrect understanding of the purpose and function of the TSPP versus its supporting guideline. The Part 1 Guideline (and therefore the model code) in its entirety is voluntary and is not a State Planning Policy. The TSPP solely includes statutory mechanisms to amend the statutory function of paragraphs A3.1 and A3.2 of Annex 3 of the existing SPP1/03 and does not include any planning policy matters.
500. Mr Reynolds goes on to state that "...*caution needs to be applied to either the way in which those maps are drawn or the effect that those maps will have in a code. It seems to me that caution needs to be applied*" (QFCOI Transcript page 4957).
501. The Authority has maintained that the IFAO mapping needs local verification as part of the ongoing refinement process, and that the model code has been specifically drafted to allow a local government to amend it to fit its local circumstances. As has been previously outlined, it is intended that a Council would use the IFAO mapping and model code offered through the Authority's work as a 'baseline' through which local information and expertise can be used to refine a more tailored local approach within the respective local government area. The 'caution' that Mr Reynolds refers to would therefore be inherent to this local verification process that a local government would undertake as a matter of course prior to formally adopting either the IFAO mapping or their version of the model code.
502. Mr Reynolds states that "*the second thing about the QRA mapping is that it's intended to – as explained in the temporary state planning policy documents – it's intended to be available for triggering building code matters, and that's a little more problematic because if you have these large areas which are – which haven't been resolved to a finer degree, then to automatically trigger some mandated requirement under building codes needs extreme caution*" (QFCOI Transcript Page 4957).
503. To clarify Mr Reynolds' statement, the proposed new Queensland Development Code (QDC) provisions are only applicable where a Council has resolved to identify a flood hazard area under section 13 of the *Building Regulation 2006*. The TSPP does not trigger the building code matters Mr Reynolds refers to – this still must be undertaken via a Council resolution under section 13 of the *Building Regulation 2006*.

504. Mr Reynolds further states that ...*"there may be some sort of a performance criteria or acceptable solution that is carefully drafted such that the initial test is not overly onerous to establish. It might be that within a planning scheme policy of the planning scheme there is a standards basic requirement for information that is appropriate to be submitted with an application, so that the local authority can have a think about whether this allotment is free or – free or – free or affected. If that – after that first less onerous assessment the local authority deems that there might be some concerns then perhaps these – this planning scheme policy might include a more onerous, if you like, set of information requirements for the preparation of some sort of a study or further information that might require some sort of technical consultant expertise"* (QFCOI Transcript Page 4959).

505. This approach recommended by Mr Reynolds reproduces the current practice in the majority of existing planning schemes currently in use in Queensland. This approach:

- a) Is not SPP1/03 compliant;
- b) Does not give clarity on the planning policy approach desired by the local government;
- c) Does not give a clear understanding of the areas subject (or potentially subject) to flooding;
- d) Puts the onus for understanding and quantifying flood impact on the applicant, which is current practice in most parts of the State and arguably causes much of the inaccuracy/inconsistency in addressing flood impact;
- e) Gives no indication of what the 'standard basic requirement for information' that is suggested by Mr Reynolds may actually entail. It is not clear that the extent of investigation that may be required by the applicant to obtain this information;
- f) Likely increases the cost of development applications to obtain this information (most likely through a site-based flood investigation); and
- g) Would likely exacerbate the inefficiencies in the development assessment system that Mr Reynolds notes during his evidence as a far more detailed assessment would be required of the local government (QFCOI Transcript page 4957).

506. The IFAO mapping and model code prepared by the Authority achieves the outcomes desired by Mr Reynolds. Specifically, the IFAO mapping and model code:

- a) Gives a general spatial extent that is appropriate for use as a trigger in existing planning schemes for additional development assessment criteria (the model code) and therefore a clearer understanding of the areas for consideration of flooding;
- b) Allows Councils to 'front-load' questions about flood impacts early on in the development assessment process, potentially reducing information requests;

- c) Presents the planning policy matters desired by a local government in the subject area through the model code, and permits assessment against these without the need to undertake more detailed investigations;
- d) Does not preclude a local government from requesting more information on flooding impact on a per application basis if desired; and
- e) Provides more information and certainty for the community in understanding flooding and the desired planning response to it through both the IFAO mapping and the model code.

507. Mr Reynolds goes on to state "*so however you get there the Queensland Planning Provisions are an appropriate place to try and set down the basic method or framework for these provisions. Now, you need to be cautious because there's many planning schemes in Queensland that are existing and it might just be modified or amended in less significant ways, and those planning schemes follow another format. So the method, whatever the solution is, also needs to be adaptable and able to be adopted by existing local governments that do not operate QPP compliant planning schemes* (QFCOI Transcript Page 4959).

508. A fit for purpose approach for both mapping and planning scheme provisions has been the focus of the floodplain management toolkit. The Part 1 Guideline and supporting model code provisions can be applied to varying types of existing planning schemes that currently exist. The Part 2 Guideline builds upon the provisions provided in Part 1 to provide planning responses that are consistent with the process identified in QPP to manage floodplain management in future planning schemes.

509. Following Mr Reynolds' evidence on 11 November 2011, the Authority gave Mr Reynolds a detailed briefing of the Authority's floodplain management toolkit on 24 November 2011. Mr Reynolds was appreciative of the detailed briefing, as it gave him the opportunity to understand the Authority's work in greater detail. Mr Reynolds acknowledged the extent and intended application of the work. Mr Reynolds also requested that the Authority present its work to his staff as he considered it of significant value for his staff to understand the purpose of the work and the approach taken. The presentation given to Mr Reynolds is included at attachment BJN-48.

### **General**

510. I refer to BJN-13 provided in my original statement. I attach a copy of the final report 'Review and Analysis of Existing – Queensland Planning Schemes – Flood Provisions' dated 24 November 2011 included at attachment BJN-49.

I make this solemn declaration conscientiously believing the same to be true, and by virtue of the provisions of the *Oaths Act 1867*.

Signed . . . . .

Taken and declared before me, at Brisbane this 30<sup>th</sup> day of November 2011

Solicitor/Barr  
Peace/Comm