Queensland Floods Commission of Inquiry

Flood Mapping Submission by the Ipswich City Council

4 November 2011

QFCI

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Contents

1. Executive Summary and Conclusions

1.1 By letter dated 18 October 2011, the Commission advised that it was considering the possibility of making findings and recommendations regarding aspects of flood mapping in Queensland. The Commission has sought comment from interested parties including the Ipswich City Council (**ICC**) in response to its list of questions in relation to flood mapping and flood modelling. ICC provides the following recommendations in response to the Commission's list of questions.

1.2 It is ICC's view that a consistent approach to flood modelling and flood mapping should be adopted to allow a regionally uniform methodology in respect of flood plain management and flood mitigation, as well as to facilitate a consistent catchment-wide approach to data collection and interpretation. ICC is of the view that consistency can be achieved by:

(a) undertaking mapping based on the boundaries of regional catchments (section 3.1 to 3.6);

(b) the State having overall responsibility for the coordination and funding of regional flood modelling and flood mapping in Queensland. This would allow a regionally consistent approach to flood mapping and the appropriate allocation of resources;

(c) importantly, each local government having input into the regional flood modelling and flood mapping; and

(d) the implementation of mapping guidelines to guide flood mapping in Queensland.

1.3 ICC supports the establishment of a centralised data repository for all the publicly available flood data together with the results of any review or analysis of that data.

1.4 Further, ICC supports that centralised data being made publicly available to assist the public to be fully informed when making decisions such as purchasing a property or making a development application.

2. Introduction

2.1 By letter dated 18 October 2011, the Commission advised that it was considering the possibility of making findings and recommendations regarding aspects of flood mapping in Queensland. The Commission has sought comment from interested parties including ICC in response to its list of questions.

2.2 As noted in the Commission's letter dated 18 October 2011, there are a range of other matters relating to flood mapping which are not considered in the Commission's question list. ICC has responded to the issues identified in the Commission's question list.

2.3 The Commission has sought submissions in respect of the above questions by close of business on Friday 4 November 2011.

3. ICC Submission in Response to Commission's Questions

Question 1: What area should be covered by a flood map? For example, a local government area, a catchment, a basin, a sub-basin?

3.1 ICC's view is that generally flood mapping (and flood modelling being undertaken for the purpose of producing flood mapping) should be undertaken within the boundaries of regional catchments. It is recognised that regional catchments may occur across local government boundaries. As outlined below, ICC recommends that the State should have overall responsibility for ensuring that a consistent approach is adopted in the generation of flood mapping across local government areas, with input from local governments.

3.2 An advantage of undertaking flood mapping based on regional catchments is that it will enable a consistent catchment-wide approach to flood mapping. This will then allow a regionally consistent approach to be adopted in respect of flood plain management and flood mitigation as well as facilitating a consistent catchment-wide approach to data interpretation.

3.3 ICC acknowledges that there may be instances where, given particular complexities, an alternative to a regional catchment methodology to flood modelling may be preferable. For example, ICC would recommend that in the preparation of flood modelling and flood maps, the combined Brisbane River/Bremer River catchment be considered as a single entity. This is particularly important given the interrelationship between flooding in both rivers as evidenced by the 1974 floods and the more recent January 2011 flood event. In this regard, ICC refers to paragraph 13 of the Joint Expert Statement - Bremer River (**Joint Expert Report**) of flooding experts prepared for the Commission dated 25 October 2011 which states that:

> "*Additional complexities are added to the study of the Ipswich area by the interaction between the Brisbane and Bremer rivers leading to influence of Brisbane River backwater on flood levels in Ipswich. These additional complexities require special consideration over and above estimation of flooding in the lower Brisbane River. Flooding can be experienced in Ipswich by force of the effects of the Brisbane River and/or the Bremer River, and in some circumstances flooding will occur without influences from the operation of the Wivenhoe and Somerset Dams*".

3.4 Flood mapping should include definitions of typical flood hazard parameters, including velocity, surface water level, depth and velocity/depth ratio. Other parameters should include identification of the scale of flood hazard using SCARM report 73[1].

3.5 ICC recommends that flood modelling (preferably 2D/1D flood models) should be used to define dynamic flood behaviour for major rivers and creeks on a regional catchment approach. For example, Brisbane River catchment includes Bremer River and associated creek system catchments. ICC recommends that within each regional catchment a network of regional and local reporting nodes be identified. In an urban context, regional flood mapping should encompass rivers and creeks to the approximate extent of stream order 4 and above.

3.6 Beyond the extent of and upstream of major waterway systems (which should be the subject of regional flood modelling and mapping), the local flood modelling (with additional nodes) and mapping should be developed and coordinated by the local government, but informed by the regional flood model.

Question 2: Who should be responsible for flood mapping? For example, the Queensland Government, the Commonwealth Government, local governments, catchment-based authorities? If some sort of joint responsibility, how would this work in practice?

3.7 ICC recommends that the State should have overall responsibility for the coordination and funding of regional flood modelling and flood mapping within Queensland. This flood modelling and thus flood mapping should be coordinated and developed by State agencies such as the Department of Environment and Resource Management and the Department of Local Government and Planning.

3.8 However, ICC notes that the production of flood mapping cannot be undertaken in isolation from local governments impacted by the flood mapping. Paragraph 34 of the Joint Expert Report provides that:

> "*In order to achieve the consistency and shared understanding of the data and modelling outputs, the relevant stakeholders should be involved in the assessment of model calibration and performance.*[2]"

3.9 In this regard, ICC notes that it is critical that each local government have input to the regional flood modelling and mapping to provide:

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[1] Standing Committee on Agriculture and RESOURCE Management (SCARM) Series. Floodplain Management in Australia: Best Practice and Principles and Guidelines (CSIRO Publishing 2000).

[2] COI transcript page 4362 line 40 and following identifies relevant stakeholders as including ICC.

(a) access to detailed local knowledge concerning hydrology and hydraulics of local catchment and sub-catchments;

(b) details of current and planned land use parameters;

(c) information in relation to future local government planned major road/open space infrastructure and drainage/flood mitigation works;

(d) details of possible future nodal parameters critical to understand modelling parameters; and

(e) integration to local government disaster management in relation to flooding.

3.10 ICC suggests that this process could be coordinated between State Agencies and local governments by establishing a catchment based steering advisory committee to oversee and work in conjunction with a technical working group. The steering advisory committee would be comprised of senior representatives of each affected local government and the State. The technical working group would include officers with expertise in relevant fields such as engineering, hydraulics and town planning from both the State and affected local governments. The technical working group would engage with independent experts where required and provide advice to the steering advisory committee. Each steering advisory committee would be able to advise the relevant State agencies on the development of flood modelling and mapping.

Question 3: Who should perform flood mapping? For example, private experts, officers or local, State or Commonwealth governments?

3.11 In accordance with ICC's submissions in respect of Questions 1 and 2, ICC recommends that the State should have overall responsibility for the coordination of flood modelling and mapping. The advantages of this approach are:

(a) it will ensure that a regionally consistent approach to flood mapping is adopted;

(b) it will ensure that resources are allocated in the most appropriate manner across the State; and

(c) the State has significantly more purchasing power than individual local governments and may achieve better economies of scale.

3.12 In terms of whether flood mapping is to be performed by State employees, local government employees or private experts, ICC submits that the critical issue is not so much the nature of the person's employment but rather that the person appointed to perform the flood mapping has

the necessary skills and qualifications and access to the appropriate data and models. However ICC also notes that appropriate strategies need to be implemented to ensure that there are enough appropriately qualified personnel to enable the flood mapping to occur. In practice, ICC notes that in order to achieve this balance, it may be that the flood mapping is performed by a combination of State and local government officers as well as private sector experts.

3.13 ICC acknowledges that by adopting a centralised state wide approach to flood mapping there may be a risk that local issues and knowledge are not appropriately incorporated into the flood mapping. It is essential that this risk is recognised and addressed. As noted above at paragraph 3.9, ICC considers that it is critical that each relevant local government have significant input to the regional flood modelling and mapping.

3.14 ICC submits that once flood mapping has been developed, the application of flood mapping in the planning scheme through a defined flood event(s) and development controls is a matter that must remain the responsibility of local government. Local government is best placed to determine how flood mapping is to be incorporated within a planning scheme and how development decisions should be assessed and conditioned against flood risk. It is ICC's view that another layer of administration should not be created to assess land use planning decisions where flooding is relevant. Local government is the appropriate level of government to address flooding in land use planning. Flooding is but one consideration in the development of a planning scheme and development assessment. Planning schemes need to give guidance and balance a range of ecological, economic and social factors, land use allocations, infrastructure and community expectations. Local government is best placed to undertake this task, which will necessarily include flood mapping and flood risk assessment and controls within its planning scheme. For those local governments who lack the resources to undertake this task, ICC supports the voluntary adoption by those local governments of a model code such as the Interim Floodplain Assessment Overlay Model Code developed by the Queensland Reconstruction Authority.

Question 4: Should there be mapping guidelines to guide all flood mapping contemplated in Queensland? If so, who should set the guidelines?

3.15 ICC supports the adoption of mapping guidelines to guide flood mapping in Queensland. As the guidelines would have State-wide implications, ICC recommends that the State have ultimate responsibility for the setting of the guidelines.

3.16 However, in order to ensure that the guidelines give appropriate regard to local and regional issues, ICC submits that consultation between local governments, experts and the relevant State agencies should be undertaken prior to the guidelines being set. As a minimum the guidelines should set principles on how to translate flood modelling data into flood mapping.

Question 5: Who should fund flood mapping? For example, local governments wholly, state governments wholly, commonwealth government wholly, current resilience funding program arrangements, another type of joint funding involving the State, Commonwealth and local governments? What other funding options are available?

3.17 ICC submits that the funding of flood mapping should be a joint responsibility of the State and Commonwealth governments.

3.18 ICC notes that the undertaking of relevant flood studies and flood mapping would pose a significant financial burden on local governments and in some instances the financial burden would be prohibitive. In practice, any requirement for local governments to mandatorily contribute to the funding of flood mapping may impede the progress of the flood mapping. This is because some local governments are not able to afford to contribute to the cost of the flood mapping, including the data collation required, such as digital terrain modelling. Often catchment basins occur across local government jurisdictions. It is not practical to coordinate the distribution of costs across local governments.

3.19 ICC is of the view that Commonwealth Government funding support for flood modelling is justifiable due to:

(a) the major economic impacts of flood events and recovery;

(b) the requirement for adaptability of major infrastructure and essential community services;

(c) improved outcomes and reduced cost in terms of mitigation works; and

(d) the impact of climate change on potential for flooding.

3.20 As flood mapping will be an input into any Flood Risk Management Study, such as that recommended by Paul Grech in the Report to Queensland Floods Commission of Inquiry Addressing Town Planning Issues October 2011 **(the Grech Report)**, funding from the State and Commonwealth should also be available to enable local government to undertake Flood Risk Management Studies.

Question 6: What amount of data-sharing is appropriate? Should any agency which contemplates a flood study be required to share its information with other government agencies, insurance companies and financial institutions? On what terms should it be required to share such information?

3.21 ICC supports the establishment of a centralised data repository of all the available data that is presently available from different sources, together with the results of any review and analysis of that data.

3.22 The advantage of the above approach is that it will ensure that all government agencies have access to the most relevant and up to date information available. ICC expects that the sharing of relevant flood studies amongst government agencies will help minimise costs. It is noted however, that historical data would need to be clearly differentiated from current data, as data in the past has been analysed by a range of different methodologies, affecting the consistency of interpretation.

3.23 In respect of access to information by insurance companies and financial institutions, this is addressed at paragraphs 3.29 to 3.30 of this Submission.

3.24 It is ICC's view that access to the centralised data repository should be available free of charge to local governments, the development industry, insurance companies, financial institutions and the public. To remain relevant, the repository will need to be established and funded to ensure that it is up-to-date, accessible and structured in a user-friendly manner.

Question 7: What types of flood mapping should be available to the public to enable them to be properly informed when making decisions affecting land planning, such as purchasing a property or making a development application, and in the context of an emergency, such as deciding whether and when to evacuate? Should the flood mapping available to them be, for example:

(a) *the flood maps or information used in local planning schemes*

(b) *flood maps and information held by State government agencies*

(c) *flood maps and information held by Commonwealth government agencies*

(d) *maps showing flood risk, historical flood height at property and similar*

(e) *maps showing evacuation routes*

(f) *maps showing zones of land that are likely to be flooded in certain eventualities ie when the flood rises about a certain height at a certain gauge.*

3.25 ICC is of the view that the public should have access to historical flood data and flood mapping within planning schemes to allow the public to be properly informed when making decisions affecting land use planning, such as purchasing a property or making a development application. As the Commission is aware, ICC has recently launched an online mapping system that allows members of the public to download maps identifying:

(a) the impact of the 1974 and 2011 events. These maps are accessible on a whole of city basis, but are also then broken down into 51 separate suburbs/localities; and

(b) maps and data showing the impact of the 1974 and 2011 events as those events relate to each individual property across the Ipswich Local Government area. This information is available as it relates to a specific street address or lot/plan number.

ICC has determined to express the property specific data by reference to AHD flood levels, as AHD is the commonly used measure by which relevant authorities (e.g. emergency authorities) express predicted flood levels.

3.26 ICC considers that it would not be practical for a planning scheme to show evacuation routes, particularly as in the life of a planning scheme these may change significantly when changes to the road network occur. ICC considers that this information is best provided through the disaster management preparation and planning framework and related evacuation sub-plans.

3.27 ICC recognises the benefits of a real-time online service that is accessible during a flood event that identifies land that is likely to be flooded if and when certain flood heights are reached at identified gauges. This would assist the public to understand in a flood event the potential for their land to be flooded and the potential flood heights on their land. ICC has been investigating this option however notes that any local government would be financially constrained in implementing a system of this nature. In any case, this tool would be supplementary to the critical information broadcast by state emergency services. In the event of an emergency, ICC would suggest that it is sensible for residents to be referred to their local emergency authority or a reputable media source for information relating to emergency evacuation routes and current and predicted flood levels, rather than rely solely on any online mapping tool.

Question 8: What sort of information should be provided to members of the public to assist them in understanding the maps?

3.28 ICC believes that, as a minimum, all published flood maps should include a schedule of acronyms and defined terms. Maps should also be accompanied by a legend which includes information that will allow relativity of mapping to actual circumstances to be determined. The online flood mapping recently launched by ICC provides information on "eave heights" relative to flood levels. Additionally, the ICC submits that it would be beneficial for the State to publish a guideline or handbook to assist the public to interpret flood maps.

Question 9: What sort of information or mapping should be available to insurance companies or financial institutions for them to use in decisions about providing products to consumers?

3.29 ICC does not support the proposition that insurance companies or financial institutions should, as a general right, be provided with additional information that is not available to the general public.

3.30 ICC submits that in their general access rights to information, insurance companies and financial institutions should not be placed in a position that is more favourable in terms of accessing flood information than that of the public to whom they sell their products.