

SUBMISSION TO THE FLOOD INQUIRY

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INTRODUCTION

Focus on land use planning issues - The terms of reference of the Inquiry which this submission addresses specifically are:

- ‘... make full and careful inquiry in an open and independent manner with respect to ...
g) all aspects of land use planning through local and regional planning systems to minimise infrastructure and property impacts from floods,
h) in undertaking its inquiries, the Commission is required to:
- take into account the regional and geographic differences across affected communities; and
 - seek public submissions and hold meetings in affected communities.’

This submission raises issues associated with land use planning processes which have both direct and indirect property and infrastructure impacts because of the possibility of flooding.

Focus on Oxley Creek catchment - Although it is possible that the Flood Inquiry may focus only on Brisbane River flooding, our focus is on the impact of changes which are occurring in the Oxley Creek catchment which have the capacity to affect Brisbane River flows. Currently, the contribution of this relatively large shallow catchment to Brisbane River flows is typically delayed by up to one day because of the characteristics of the catchment, however increasing the settlement levels (development) within the catchment will increase the likelihood of faster response times, thus making it more advisable to consider the impact of changes in this catchment on Brisbane River flooding.

This submission therefore will address regional and geographic differences across affected communities.

As well as preparing this submission, we also welcome invitations to public meetings to discuss our concerns.

BACKGROUND

Physical characteristics of the Oxley Creek Catchment and the 1974 flood experience – The physical and ecological/biodiversity characteristics of the 26,000 hectare (260 square kilometres) Oxley Creek catchment are described by the Oxley Creek Catchment Association in ‘Our Catchment’ contained in **Attachment 1** to this submission.

As the 1974 flood is the only Oxley Creek catchment flood remembered by local residents, which appears to have directly impacted the middle catchment as well as the flood plain in the lower reaches, extracts from the report by the Bureau of Meteorology (BOM) for January 1974¹ are instructive. These are at **Attachment 2**. (In recent planning documents, the middle catchment is referred to as ‘Lower Oxley Creek’.) In summary the extracts identify that the low flat catchment results in delays in flooding following heavy rains by 18-24 hours. Heavy rainfall across the upper

¹ *Brisbane Floods January 1974 – Report by Director of Meteorology*, Department of Science Bureau of Meteorology, Australian Government Publishing Service 1974, pages 11, 12, 21, 26, 32.

catchment in 1974 resulted in a single flood reaching record levels. Anecdotally, this flood rose (as overland flow from the creek) across the more low-lying sections of Pallara or 'Lower Oxley Creek' and dropped within approximately 6 hours, while other parts of Brisbane remained flooded for much longer.

In 1974, the BOM report concluded that improving the predictions of flood levels in all metropolitan creeks including Oxley Creek, was important and suggested the use of quantitative rainfall estimates from radar observations.

Prior to 1974, the report notes the earliest flood recorded in the Brisbane River was in 1841 – there was no mention of impacts in the middle reaches of Oxley Creek ... although in 1864 (peak 4.92 m), flood waters extended from the junction of Oxley Creek and the Brisbane River to the high land at the back of Coopers Plains, a distance of about 11 km.

In conclusion, these two events occurring more than 100 years apart would not indicate that areas within 'Lower Oxley Creek' or in Oxley Creek's middle reaches that were affected briefly by overland flow in 1974 are flood prone.

Recent Queensland Government legislative and policy changes which impact on land use planning in the Lower Oxley Creek Catchment - Recently endorsed legislation or State Planning Policies relating to the preservation of koala habitat and to address the impacts of climate change, along with the *Tomorrow's Queensland Toward Q2* Green targets to increase both the land for public recreation and the land for conservation by 50% each across Queensland by 2020, combine in impact when framing planning documents for places like Oxley Creek. Lower Oxley Creek contains koala habitat; it is characterised by good quality remnant bushland² and is prone to localised overland flow following rainfall in the catchment. These characteristics make the riparian properties in the Lower Oxley Creek attractive to local and State government planners seeking to address these planning imperatives. **Want them for Greenspace but they don't want to have to pay**

SEQ Regional Plan 2009-2031 and local neighbourhood planning processes - We are all aware the population in the SEQ Region is rising. An outcome of the 2009-2031 SEQ Regional Plan was to bring forward and consolidate development within the Urban Footprint, before seeking to open up more land for development outside its current boundaries.

In the middle catchment of Lower Oxley Creek, Stockland's purchase of land along Brookbent Road, Pallara inspired their interest in making a prompt return on their investment. They provided the funding required to initiate a neighbourhood planning process for the Paradise Wetlands development. Neighbourhood planning for the surrounding Lower Oxley Creek area followed. Both the draft Paradise Wetlands Neighbourhood Plan and the Lower Oxley Creek (South) Neighbourhood Plan are currently undergoing First State Interests Checks.

ISSUES

² Privately managed bushland in Pallara and Willawong has been improved through citizens' voluntary efforts to clear weeds and plant endemic species. During 2004-2005, local residents obtained approximately \$26,000 in Envirofund assistance and matched this with in-kind contributions and voluntary labour to clear weeds and re-plant parts of their blocks. This effort extended over two years and has since been supplemented by follow-up weed control courtesy of Cemex, local sand-miners, intending to rehabilitate some of the areas affected by sand mining. The result is relatively good quality natural bushland which has been achieved through the goodwill of local citizens.

Uncertainty about the impacts of the developments mentioned in all parts of the catchment in relation to overland flows, creek levels – This neighbourhood planning activity (above) coincides with planned development elsewhere in the upper catchment e.g. South Ripley, New Beith, Greenbank. These upstream developments within the Oxley Creek catchment (in Logan City) and in the Ipswich City and Scenic Rim Regional Councils will contribute to a total increase in South East Queensland's population equivalent to Canberra's.

As well as the broad plans to develop the Lower Oxley Creek and Paradise Wetlands which will bring their own impacts, at the finest level, there are associated council proposals for local road upgrades and developers will need to fill to allow for safe development in Paradise Wetlands. Potential road upgrades include Paradise Road at Willawong, Pallara and Larapinta, and potentially Brookbent Road, Pallara to support re-instating the Brookbent Road bridge. It is understood that filling from between 0.8m to 2.5m will be required to achieve the proposed Residential South precinct along Brookbent Road in Paradise Wetlands. In addition to development generally producing higher levels of stormwater runoff, overland and creek flow, these changes are also likely to act as dams, despite the use of retention basins regulating water flows into Oxley Creek.

However, the combined impact of these developments, if known, has not been made public.

It is a reasonable assumption that settlements in the upper and middle Oxley catchment (South Ripley, New Beith, Greenbank), Paradise Wetlands and Lower Oxley Creek (incorporating the suburbs Heathwood, Pallara and Willawong) will harden surfaces which were previously absorbent, increase surface runoff or overland flows and contribute to greater volumes of creek flow. Although it is a legal requirement that retention basins are constructed to regulate the net contribution to creek flows from individual rainfall events, these arrangements are known anecdotally to be imperfect.

Despite the concern that development and densification of settlement across the catchment will increase the likelihood and incidence of flooding in low-lying areas of Lower Oxley Creek, the actual impacts of these settlements combined with post 1974 changes to the catchment have not been modelled to estimate the likely levels and incidence of future overland flows. Other large structures affecting overland flows have been constructed across the Oxley Creek catchment since 1974. These include the Logan-Ipswich Motorway and further downstream, Learoyd Road.

Impacts of planning imperatives – It appears to Lower Oxley Creek residents who own properties along Oxley Creek which are completely designated 'Waterway Corridor' in the draft Lower Oxley Creek (South) Neighbourhood Plan, that planners either are aware that the impact of catchment changes will increase riparian flooding or see opportunities to address State government imperatives by using this classification.

However, opportunities for planners should not result in lifestyle and obvious financial losses for local residents, many of whom have been responsible custodians of their properties and the broader community for decades. Collectively, Lower Oxley residents have built their own roads, undertaken their own cooperative fire management, drawn attention to serious waste management issues, safeguarded local air quality, collaborated to improve and maintain the quality of the local bushland and provided wildlife protection services for the broader community over many years.

If the collective impact of planning decisions (albeit in neighbouring councils) is to increase the incidence of flooding on properties which would previously have been considered quite safe, adequate levels of compensation must be budgeted for and factored into any future flood mitigation planning.

This constitutes responsible land planning and management by councils and would encourage the cooperation of property owners.

In addition, as riparian corridors provide useful opportunities for addressing some planning imperatives, where good quality riparian bushland exists, it should be appropriately valued because it is increasingly rare.

Impacts of densification on amenity and lifestyle – The physical impacts of planned development (densification of settlement) anywhere include loss of greenspace, habitat, amenity; higher temperatures; dust and higher incidence of air pollution; possible soil erosion; hardening of surfaces (through the loss of natural vegetation, construction of roads, roofs, footpaths); increases in overland flows; potential increases in creek flows. If development and subdivision yield better property prices, owners of quality bushland properties will be encouraged to seek to develop rather than preserve this rare resource.

Uncertainty about the weather/climate and the impacts of climate change on this catchment – Having lived through the past decade in South-east Queensland, residents can confirm that we live in a land of ‘droughts and flooding rains’. If climate change will produce more frequent, more extreme weather events, future catchment management needs to focus on water storage as well as flood mitigation.

Not only will new communities need to accommodate the local impacts of changes to catchments to avoid creating unforeseen catchment effects downstream, they will need to ‘build in’ the mechanisms to respond to both longer and more extreme droughts as well as flooding rains and exacerbated flooding partly because sea levels may be up to 0.8m higher within the next 90 years.

This submission argues that these goals could be achieved through complementary initiatives.

SOLUTIONS

Improved understanding of the multiple impacts - Updated computer modelling for different sections of the Oxley Creek catchment is necessary to determine the likely impacts of upstream and more local physical changes in different parts of the catchment e.g. the construction of the Logan-Ipswich Motorway and Learoyd Road which could potentially impact flood events in the middle reaches of the catchment (or Lower Oxley Creek). Modelling should indicate changes to overland flows, creek volumes and the potential characteristics (incidence, levels) of flooding, as well as the contribution of each new planned development, using different water saving, community design treatments.

As well as recent physical changes to the entire catchment, this modelling should also factor in the combined and longer term impacts of climate change such as variations in rainfall patterns, changing sea levels and other consequences.

Risk prevention: dams, reservoirs, retention basins, water storages - Dams, reservoirs/lakes, retention basins at all levels should be constructed or stabilised.

In the Oxley catchment, the **Greenbank Military Training Area (GMTA)** is a relevant location for a dam. Despite the initial constraint associated with unexploded ordnances, the area is surrounded by residential and industrial developments which all require water. A dam here would help regulate any flood threat from Oxley Creek waters to the Lower Oxley catchment, the Oxley floodplains and Brisbane. It could also replenish the large aquifer in this area, thus topping up Brisbane's emergency water supply during drought, as well as providing another needed surface water storage (Queensland Premier, Anna Bligh, 2010).

The GMTA is government owned land. Its use for a dam would minimise the need for messy dispossession arrangements which confounded the development of the Traveston Crossing Dam.

The GMTA is an important component of the Flinders to Greenbank-Karawatha vegetation corridor. Creating a dam in the GMTA would not reduce the land for conservation already counted towards achieving the Queensland Government Toward Q2 Green target, but would provide a reliable water source for wildlife and enhance the vegetation corridor.

Long-term maintenance, rehabilitation or removal of **earth bunds** constructed by sand miners near Johnson Road and the Anabran on Oxley Creek are required. These show signs of deterioration and pose a constant threat to residents both locally and downstream especially during high creek flows, resulting in the need for emergency repairs. In addition, creek bank rehabilitation of subsoil subsidence in the vicinity of sand mines, needs to occur. These activities would address the possibility of the bunds breaching and ensure soil erosion does not contribute to creek flows and compromise water quality in Oxley Creek and Moreton Bay, especially if increased settlement will result in higher background creek volumes.

In addition, at every opportunity planning policies should require that **local water storages** be incorporated into community and building design. Examples include but should not be limited to:

- underground storages to service sport and recreation ovals and parks;
- water storages built into every new residence and industrial complex to save and store the water needed at least for garden irrigation, cleaning and grey/black water applications, as well as to supply potable water; and
- water soakage treatments in all new local neighbourhood developments that encourage soakage and yield a guaranteed no-net-increase in overland flow or runoff as a consequence of residential or industrial development e.g. special paving on road verges, traffic islands, footpath verges – if it is good enough for Caloundra South, why isn't it good enough for catchments leading/feeding into the Brisbane River?

These measures will combine to store rain water in the local community thus smoothing out the peaks and troughs in water supplies typical of the Oxley catchment.

- To monitor the impacts of these overland flow amelioration treatments, stream monitoring stations need to be installed prior to all new developments so that readings can be taken continuously to monitor the effect of new developments on creek volumes. Readings from these stations, coupled with rainfall records and other information can be used to finetune flood modelling in the Oxley Creek catchment and potentially other catchments supplying the Brisbane River.

Risk reduction – Openly communicate and apply **sound 'change management' principles** in town planning processes where communities will change irrevocably because some areas are obviously

earmarked for development and others will obviously be rendered unable to be developed (in this case because of the potential for an increased likelihood of flooding).

Neighbourhood planning processes used to date by Brisbane City Council are largely unsatisfactory as change management tools. Although planners inform communities that change is likely, planners also make reassuring statements regarding 'staying as you are' and 'there will be no losers'. These are misleading. Also, Community Planning Teams (CPT) are created to include local volunteers or a selection of volunteers, but then CPT members cannot communicate mooted changes or proposals. This process does not allow those keen to embrace change to act as change agents and it divides the community. A better approach would be for all community members to be involved in a change management process with the capacity to contribute collaboratively to developing planning solutions, especially where imperatives such as increased likelihood of flooding force change.

Prepare to fairly compensate adversely affected landowners whose properties will need to be resumed to accommodate dams, waterway corridors – Community members are much more likely to embrace proposed changes to land uses in local areas to accommodate dams or increases in overland flow, if a fair system of compensation is available to affected landowners. In other States, this involves offering landowners compensation rates equivalent to the average of the last three land sales in that locality. Refer to **Attachment 3**.

CONCLUSIONS AND RECOMMENDATIONS

In conclusion, this submission makes the following points: flood planning and mitigation in the Brisbane River catchment must also consider and manage the impacts of changes in tributary catchments such as the Oxley Creek for the planning to be effective.

In the current environment, new land use plans need to address a number of imperatives including population increases in south-east Queensland, the need to preserve existing greenspace and habitat for both conservation and public recreation and to address expected changes which may result from climate change. Riparian corridors provide useful opportunities for addressing these planning imperatives, but such land should be appropriately valued because it is increasingly rare.

Likely flood incidence and flood planning should be informed by **up-to-date computer modelling** which takes account of existing and planned future changes in catchments.

Investment in the construction of dams, reservoirs and retention basins, the stabilisation of bunds and the rehabilitation of damaged creek banks will all aid flood mitigation.

Comprehensive new planning policies relating to community design and construction standards should be applied to addressing the impacts of climate change. The **practices** which result have the potential to address the needs for both water storage during droughts and flood mitigation during high rainfall periods.

Where plans are developed to change existing communities to address flood risks and address planning imperatives but individual land owners will be adversely affected, **adequate and fair compensation** should be made available. This will encourage property owners to embrace the plans thus facilitating both sound flood management and the efficient achievement of planning outcomes. This may also ensure quality bushland along riparian corridors is valued appropriately and preserved.

Our Catchment



Oxley Creek, a tributary of the Brisbane River, drains a catchment area of approximately 26 000 ha in the local government areas of Logan City and Brisbane City, and a small area of Ipswich City.

Oxley Creek has its headwaters on the northern slopes of Mt Perry in the Flinders Peak area. The creek stretches some 70 km, and eventually discharges into the Brisbane River at Tennyson. The eastern tributaries are Stable Swamp Creek, Moolabin Creek, Rocky Water Holes and Sheep Station Gully. From the west, the waterways of Crewes, Blunder, Hanley's, and Little Doris carry their water to the main creek.

In the south, elevated land in the headwaters of the catchment is largely covered by dry forest, and in parts is relatively sparsely populated. However, rural residential land uses and more intense urban development pressures are increasing and some grazing and turf farms are being replaced. More infrastructure for traffic, power and water distribution is being imposed but fortunately, the substantial areas of undisturbed vegetation, particularly within the Greenbank Military Training Area, remains.

The mid catchment area, north of Johnson Road contains the tenuous vegetated linkages of the Flinders to Greenbank-Karawatha (FGK) Corridor. This corridor includes a mosaic of lands under a variety of ownerships, tenures and jurisdictions including the major bushland areas of Flinders Peak, Mount Perry, White Rock, Greenbank Military Reserve, Forestdale, Larapinta and Parkinson together with the residential and industrial lands of Heathwood and Forest Lake. From Parkinson, the FGK Corridor has to cross Logan Motorway and Beaudesert Road before it reaches Karawatha Forest. Vegetation links exist between Blunder and Oxley Creeks in the rural areas of Pallara and Willawong and in these areas this vegetation is extremely important, not only for connections but to stabilise these fragile edges. The Willawong landfill remediation site and Transfer Station, the current and exhausted sand extraction sites, (now becoming new sites for development), the decommissioned (2005) Inala sewage treatment plant, landfills, the ecologically valuable Archerfield Wetland, and Archerfield Airport on the east complete the middle portion.



The more northerly part of the catchment stretching from the junction of Oxley and Blunder creeks to the mouth of Oxley, has vitally important flood plain areas with golf courses, the Oxley Creek Common (120 ha section of the old Rocklea Research Farm), Brisbane Markets, and the augmented (2005-06) Oxley sewage treatment plant plus the major industrialised area of Rocklea Junction. To the east, the highly urbanised areas of Coopers Plains, Salisbury, Rocklea, Acacia Ridge, Archerfield and Moorooka complete the catchment.

Oxley Creek and its tributaries are recognised for their significant riparian vegetation, which form important local linkages as well as to the Brisbane River. The connections via the tributaries of Moolabin and Rocky Water Holes to Toohey Forest give a link to Norman and Bulimba creeks on the southside of Brisbane. As well, the potential for a wider regional west to east corridor, 'Peaks to Points' was celebrated with the P2P Festival in 2008 when many of the catchments on the south side of the Brisbane River joined together. Following the redrawing of local government boundaries in March 2008, the Flinders to Greenbank-Karawatha Conservation Partnership was recognised recently with a new Memorandum of Understanding, and it is hoped that arrangements more conducive to protection of the vegetation may be designed forthwith.

Source:

http://www.oxleycreekcatchment.org.au/index.php?option=com_content&view=section&layout=blog&id=6&Itemid=56 accessed on 3 April 2011.

Extracts from *Brisbane Floods January 1974 – Report by Director of Meteorology*, Department of Science Bureau of Meteorology, Australian Government Publishing Service 1974, pages 11, 12, 21, 26, 32.

‘Oxley Creek has a much larger and flatter catchment than the other Brisbane creeks, has a much slower response time to intense rainfall. Hence it is less susceptible to flash floods, although several small tributary creeks, namely Stable Swamp Creek and Blunder Creek which enter Oxley Creek in the Rocklea area, do have flash floods in high intensity rain situations. These of course are on a smaller scale to major flooding in Oxley Creek as a whole.

‘When the Brisbane River is in flood the river surface level in the main trunk stream at the junction of the tributary creeks and rivers causes water to back up into the tributaries. The addition of flood run-off from the tributaries causes higher backwater levels in the lower reaches of these tributaries. This type of flooding is common in the Bremer River at Ipswich and the effect is also observed near the mouths of the Brisbane metropolitan creeks, Oxley Creek in particular.

‘the onset of local high intensity rainfall and resultant flash flooding’ means ‘little advance warning time is possible for the Brisbane metropolitan creeks. The exception is Oxley Creek, where the time lapse is about 18 to 24 hours.’

‘Total rainfall for the 5 day period from 9 am Thursday 24 January to 9 am Tuesday 29 January is shown as an isohyetal map in Fig 7. Totals in the Brisbane metropolitan area ranged from 500 to 900 mm and exceeded 300 mm over all but the extreme western parts of the Brisbane River catchment area. Among the highest 5 day totals were 1318 mm at Mt Glorious, in the catchment of the middle reaches of the Brisbane River, and 819 mm at New Beith, near the head of Oxley Creek. The Brisbane Bureau, in the heart of the city, recorded 650 mm during this period.

During the 1974 floods, ‘on 25 and 26 January the river flood was still being generated in the Brisbane Valley, but in the Brisbane metropolitan area the three periods of intense rainfall resulted in three separate floods in the metropolitan creeks. ... The third flood occurred overnight on Saturday 26 January but was slightly lower than the first flood. In Oxley Creek, which has a large, very flat catchment and behaves in quite a different manner to the other metropolitan creeks, a single flood occurred which reached record levels.’

Flood Risk Management

The objective of flood risk management is to reduce a community's flood risk to acceptable levels, **either by reducing exposure to flooding or by reducing the vulnerability of people and property to flooding**. This involves trading off the economic, social and environmental costs of flooding against the benefits of allowing a broad range of activities to take place on the floodplain. Such trade-off decisions need to be made in a proper risk management framework, based on firstly assessing the probabilities and consequences of flooding at different levels of severity and then considering the benefits and costs of a range of flood risk management options.

The **benefits** of flood risk management options can be expressed in terms of the **reduction in expected flood damages; environmental, social and economic**, while the **costs** include the **cost of implementing the flood risk management measures as well as associated opportunity costs**.

Source: *Joint Flood Taskforce Report*, March 2011, Prepared for Brisbane City Council by the Joint Flood Taskforce, pages 6-7.

Conclusion – If flood risk management in the Lower Oxley Creek area involves designating some areas as prone to future flooding (i.e. by classifying them as Waterway Corridor in the draft Plan) to accommodate prospective increases in creek flows and consequent flooding associated with densification of settlement and other changes throughout the catchment, the benefits of accommodating this possible future must be balanced by the costs of implementing the measure including appropriate/fair compensation (based on interstate practice) of existing landowners who will be adversely affected by this change in classification.