SEQ CATCHMENTS LTD

Flood Impacts Report February 2013

EXECUTIVE SUMMARY

Ex-Tropical Cyclone Oswald brought heavy rains, strong-gale force winds and large surf to South East Queensland over the Australia Day long-weekend. The low pressure system moved slowly south over the region bringing widespread heavy rains of around 200mm. Intense localised falls, in many cases exceeding 300mm – 400mm and up to 700mm in some areas, caused widespread flash flooding, which together with the high winds caused widespread flood damage to the region.

The January 2013 flood damage follows only two years after the January 2011 floods, which caused widespread damage along the length of the Brisbane River system, including widespread flooding of Ipswich and Brisbane.

For many landowners and communities, particularly those in the Lockyer Valley Regional Council, Somerset Regional Council and Scenic Rim Regional Council regions, January 2013 was a case of *déjà vu* as farms, properties, communities, public and farming infrastructure and livelihoods again received significant damage and disruption. With the benefit of insights from the January 2011 floods, affected regions have benefited by enhanced local and State regional response efforts. Nonetheless, damage has been widespread and, in the case of many Natural Resource Assets[1] which form part of our Natural Infrastructure, was unremediated following the January 2011 floods and greatly exacerbated by the January 2013 event. This was particularly the case with the banks of major streams and rivers that continue to contribute the majority of downstream sediment pollution of water treatment plants, coastal estuaries and Moreton Bay.

For the remainder of South East Queensland, the January 2013 floods varied in a number of important ways from the January 2011 floods:-

- Many regional and suburban streams received considerably higher flows than January 2011, and as a result experienced significant bank erosion, damage to road and crossing infrastructure and loss of abutting agricultural lands. In addition;

  - Rural creeks - debris in the vicinity of bridges and crossings is a problem throughout Lockyer Valley, Somerset, Logan and Scenic Rim Councils. However, anthropogenic waste such as chemical drums is less of a problem than was the case following the January 2011 floods;

  - In some areas loss of agricultural topsoil was significantly greater than in January 2011, partly due to the timing of the flood associated with the cropping cycle as well as levees being breached; and

  - Suburban creeks – litter from storm water drains has caused serious pollution. Much of this litter has found its way to coastal beaches.

- Coastal areas were affected by strong winds, high tides and big seas. Damage to foredunes and littoral systems has occurred throughout the region.

- Significantly heavier rainfall and stream-flows were received in the southern Logan and Albert systems and in the northern Pine, Caboolture, Maroochy and Mooloolah systems than occurred in January 2011. Bank erosion has occurred throughout these systems and their major tributaries; in the case of the southern systems discharging

[1] For the purposes of this report, Natural Resource Assets refer mainly to land systems, including the soils that support the region's agricultural industries and the flood plains that support the nationally-significant horticultural industries; and the catchment systems, including the streams and rivers that generate the vast majority of sediments that pollute water treatment plants, coastal estuaries and Moreton Bay. While land systems and catchment systems are highly linked, it is useful to separate the two conceptually: Within the landscape, land systems require an area-based focus, while streams and rivers require a linear focus.

vast amounts of sediment pollution into Southern Moreton Bay, the part of the Bay that was less affected by the January 2011 sediment discharges.

The more widespread sediment discharges throughout Moreton Bay and Pumicestone may have a more extensive effect on seagrass and marine systems than occurred in January 2011. Pressures on iconic turtle and dugong populations will be significant.

- While flooding was observed throughout the Upper Brisbane, stream-flows in the main system were lower than that observed in January 2011. The same is true for the Mid Brisbane between Wivenhoe Dam and the Mt Crosby Water Treatment Plant: Bank erosion and riparian damage throughout Mid Brisbane has however been significant, reflecting in part the very poor riparian condition prior to the January 2013 floods and dam releases. Flooding in Brisbane and Ipswich was considerably less than January 2011.

- The January 2013 floods followed a relatively long period of dry weather, contrasting with the January 2011 floods that followed several months of above average rainfall. As a result:-

    - Flood plains and stream banks prior to the January 2013 event were significantly drier than was the case in January 2011 and major bank slumping along the major rivers (with the possible exception of the Mid-Brisbane Reach) appears to have been less; however

    - Catchments for major rural and suburban streams were considerably drier, sometimes recently burnt, and had considerably less grass biomass preceding the January 2013 floods. This resulted in significantly faster and greater runoff, exacerbated high stream-flows and flash flooding in these systems. As a result, extensive, significant bank scour erosion has occurred along affected rural streams.

- The January 2013 floods followed a mere two years after the January 2011 floods; whereas the January 2011 floods followed some 37 years after the last major floods in 1974. The widespread erosion that occurs during major flooding in South East Queensland has two broad affects: (i) it discharges sediments into Moreton Bay and Pumicestone; and (ii) it 'recharges' easily mobilised sediment and nutrients in streams, rivers and flood plains.
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- The widespread sediment pollution observed during the January 2013 floods has in part been exacerbated by the high levels of sediment pollution 'left in the system' following the January 2011 floods. At this stage, SEQ Catchments is unaware of any reliable estimate of sediment pollution to Moreton Bay following the January 2013 floods, but plumes of sediment in the Bay have been heavy and extensive following the floods and the 'easily mobilised sediment and nutrients' in the upper catchments have again been 'recharged' and vulnerable to further flushing during future rains.

SEQ Catchments is working with Local Governments, the Queensland Government and partner groups to help communities affected by the floods to respond to damage to Natural Infrastructure.

Three initiatives are being pursued:-

1) Undertake a very high-level, rapid assessment of key damage areas throughout the region to assist Local and Queensland Governments to formulate their short and medium-longer term responses to the floods;

2) Provide a Natural Resource Asset assessment service whereby affected landowners and Landcare and Catchment groups can contact SEQ Catchments and have their properties/catchments inspected by Natural Resource Management specialists; and

3) Continue to work with all levels of government and with stakeholder groups to direct investment into re-building the resilience of South East Queensland's Natural Infrastructure – and thereby strengthen and support key agricultural, tourism, fishing and lifestyle industries.

In relation to the first of these, SEQ Catchments maintains a network of eight Community Partnership Managers (CPMs) across the Region:-

1. Upper Brisbane and Stanley
2. Mid Brisbane and Bremer
3. Lockyer Valley
4. Logan and Albert
5. Gold Coast
6. Redlands and Moreton Bay
7. Brisbane, Moreton and Pumicestone
8. Sunshine Coast

In the days immediately following the floods, CPMs reported on the flood impacts on Natural Assets in their regions and sought feedback from key Landcare and Catchment groups. This report presents the outcomes of these high-level, rapid assessments of the January 2013 flood impacts on Natural Infrastructure across South-East Queensland.

Key conclusions are:-

- Damage to Natural Infrastructure throughout the region has been extensive.

- Bank erosion along major streams and rivers has again contributed vast amounts of sediment pollution to water treatment plants, estuaries and Moreton Bay and the Pumicestone –

  - While the quantum of sediment pollution to Moreton Bay is as yet undetermined, the quantum and extent of the January 2013 sediment plume is extensive. Damage to seagrass and dependent iconic dugong and turtle species is likely to be significant;

  - Stream bank erosion in important rural catchments has again threatened damaged lands, eroded abutting high-value agricultural lands and contributed to both landowner (fencing, irrigation equipment) and public (public lands, roads, crossings, powerlines) infrastructure losses. Without exception, bank erosion has been associated with poor riparian condition and previous degradation. These are legacy issues for South East Queensland, which will require a significant and ongoing community and government commitment to remediate;

  - Stream bank erosion has also affected important suburban creeks; and will require significant intervention to reduce potential loss to suburban landowners, businesses and public assets; and

- Debris build-up in the vicinity of crossing and road assets in Lockyer Valley, Scenic Rim, Logan and Somerset regions and litter build-up in a number of suburban creeks and coastal zones requires remediation.

- Damage to high-value horticultural lands has been particularly significant where high intensity rains and flash flooding have occurred. South East Queensland's horticultural industries account for a significant component of national production and constitute an essential food supply for South East Queensland's population. Much, if not most, of the production occurs in flood plains and 'narrow' strips of flatter, highly arable lands abutting regional streams and rivers. Productivity is dependent upon irrigation from streams, rivers and groundwater. Unfortunately, for legacy reasons, the riparian condition of most streams and rivers abutting horticultural properties is highly degraded. Floodplain management including the use of unregulated levees and cropping practices have also contributed to the loss of topsoil and high sediment load. These degraded stream and river systems contribute high quantities of sediment pollution to downstream water treatment plants, estuaries and Moreton Bay, and they continue to threaten high-value horticultural lands and the sustainability of horticultural production in the region. They are a priority for remediation.

South East Queensland's natural land and catchment systems are part of the Natural Infrastructure that underpin the region's quality of life and agricultural, fishing and tourism industries, and which support the region's biodiversity and conservation values. For a range of legacy reasons, this natural asset capital has been degraded over the last century and was further degraded as a result of the January 2011 and 2013 floods. These systems need both immediate intervention and a commitment to building natural resistance/resilience over the medium-longer term. As is the case for built infrastructure capital, natural infrastructure capital needs to be re-built/remediated in a way that increases resistance to periodic high intensity events such as the January 2011 and 2013 floods.

SEQ Catchments is working with its Local, State and Federal Government partners, its corporate clients, Healthy Waterways and key community groups has demonstrate proof-of-concept interventions that will provide durable long-term remediation of the region's natural resource land and catchment systems:

a. The **Healthy Country** concept for enhancing the resilience of land systems. In nationally-awarded pilot studies in the Bremer and Logan catchments, SEQ Catchments has worked with landowners to improve land and natural resource asset management. Incentives and support have been provided to undertake property management planning, to improve land and cover management, remediate degraded gullies and watercourses, protect broader natural resource values and the like. On the basis of these experiences, all South-east Queensland natural resource stakeholders contributed to *The Future of our Waterways, Beaches and Bay: The Business Case for Managing and Enhancing South East Queensland's Waterways*. While the Business Case needs to be updated, its core approach of prioritised staged extension of the Healthy Country concept across the region provides the basis for durable enhancement of land systems and directly supports the State's expectations for strengthening agricultural production; and

b. **River restoration** aimed directly at remediating degraded streams and rivers. While the importance of 'channels' as a sediment pollution source in SouthEast Queensland has been known for some time, the January 2011 floods highlighted that they may be the dominant sources. Following the January 2011 floods, Griffith University researchers clearly demonstrated the risk that bank erosion of degraded major streams and rivers pose to downstream sediment pollution, including of water treatment plants, estuaries and Moreton Bay. Working with its State and Federal Government, Energex, Seqwater and Reconstruction Authority funding partners, SEQ

Catchments undertook some 15 pilot restoration studies throughout the region over the past 18 months.

Restoration works were designed to stabilise degraded banks, revegetate degraded riparian areas and allow resistance to increase as the banks consolidate and the vegetation matures. While a number of these pilots were adversely affected by the January 2013 floods (as they were too young for bank consolidation and revegetation strengthening), in all cases further bank erosion was arrested. Where riparian restoration works of degraded major streams and rivers were not undertaken following the January 2011 floods, significant new erosion has occurred. Remediation of degraded major streams and rivers is a regional priority for the medium-longer term.

Based on the preliminary observations reported here, SEQ Catchments has identified both immediate high priority works and medium-longer term interventions to build resilience in the region's Natural Resource assets and help future-proof the region to high intensity events such as the January 2011 and January 2013 floods:

Immediate interventions:

- Clean-up:
    - Regional debris clean-up in the Lockyer Valley, Somerset, Logan and Scenic Rim regions, targeting debris affecting key roads and crossing infrastructure;
    - Working with Healthy Waterways to facilitate litter clean-up in key suburban creeks and coastal regions.
- LiDAR. (Light Detection And Ranging)
    - LiDAR is invaluable for quantifying sediment losses and assisting with the planning of intervention investments.
    - Post flood LiDAR is sought for the Lockyer Valley, Upper Brisbane and Mid Brisbane.
- Assessment of effectiveness of pilot studies.
- Providing a support and assessment service to landowners who have experienced Natural Resource Asset damage and losses.
    - In partnership with Local Governments, SEQ Catchments' Community Partnership Managers will visit all affected properties where assistance has been sought, assess damage, identify causes and provide support and advice.
    - SEQ Catchments' experience following the 2011 floods was that many landholders whose properties received Natural Resource Asset damage actively sought assessment assistance and, in many cases responded positively to recommendations for improving floodplain, land and catchment system management.
- Repairing key assets:

- Repair of land system investments that have been made in the Healthy Country pilot studies;
- Repair of river restoration projects that have protected the banks from further erosion, but have lost newly planted vegetation and require some engineering strengthening; and
- Emergency repair of foredunes on Coochiemudlo Island.

Medium – longer term interventions:

- Work with State and Federal Governments to expand Healthy Country investment;
- Work with State, Federal and corporate funders to restore the region's degraded stream and river banks
- Work with State, Federal and Local Government to improve flood plain management; and
- Work with Local, State and Federal Governments to repair coastal systems.

This document is our initial assessment of the 2013 flood impact on SEQ's Natural Infrastructure and more detailed recovery plans and opportunities will be developed in the near future to underpin and fund the immediate response. Work on a framework for intermediate and longer term response and investment has started in consultation with our partners.