

20 October 2014

Andrew O'Neill
Water by Design
Healthy Waterways Ltd.
PO Box 13086
Brisbane QLD 4003

Dear Andrew,

RE: Stormwater Queensland Submission – Off-site Stormwater Quality Solutions Discussion Paper

Stormwater Queensland is the peak stormwater industry body in Queensland whose purpose is to promote the efficient management of stormwater. In addition, Stormwater Queensland supports the efficient and sustainable (economically, socially and environmentally) management of all forms of water. As part of our role, we have reviewed the *Off-site Stormwater Quality Solutions Discussion Paper* and wish to thank you for the opportunity to provide comments.

Stormwater Queensland is aware of the need to address stormwater quality issues from a range of perspectives to achieve a balance between required infrastructure development and protection of the environment and our waterways.

Off-site stormwater quality solutions (commonly referred to as offsets) are a complex and new area of practice. While offsets have been effectively adopted in the vegetation and carbon domains, internationally, there is only limited experience applying offsets in a water quality context. This is due to issues with multiple pollutants, and spatial and temporal equivalence. Healthy Waterways is commended for preparing this discussion paper to help foster open discussion about this complex topic.

This response to the discussion paper represents the views of members of the Queensland state committee and does not necessarily reflect the views of all its members.

In addition to the attached detailed responses to the discussion points in the paper, we would like to highlight the following key points:

- We believe there is a need for a well-designed stormwater quality offset policy to provide an additional option to sustainably manage stormwater quality, although we are concerned that poorly designed policies can have adverse consequences. The guidelines must have sufficient detail to allow readers to recognise pathways for recognising when a water quality offset is appropriate and when it is not.
- One of the key drivers for stormwater quality offsets is poorly designed and delivered stormwater quality infrastructure, often reflecting the capability of the sector several years ago. We believe it is possible to design well integrated and low-maintenance stormwater quality infrastructure in many development contexts, and advocate further investment in industry capacity building, so that offsets are not seen as a 'quick fix'.
- Contemporary stormwater management involves more than managing stormwater quality. It includes the management of hydrology and using stormwater within the urban landscape to creating healthier urban environments. These issues are intrinsically linked, and stormwater quality should not be considered in isolation.

- While the reason for the title of the discussion paper is understood, stormwater quality offsets should be called stormwater quality offsets. Alternative terminology such as off-site stormwater quality solutions can be confusing. It is unclear whether the logic that stormwater offsets cannot be called such because stormwater quality is not considered within the Environmental Offsets Acts (2014) is a correct legal interpretation or simply opinion.
- Erosion and sediment control is an important stormwater quality issue but is omitted from the discussion paper. It should form part of any policy discussion on stormwater quality.
- Proper catchment planning is critical to delivering on the community's expectations for a healthy environment in a strategic and cost effective manner. With proper catchment planning, most of the decisions about when and how to use offsets are substantially resolved.
- Offsets should be considered in an adaptive management framework, with policy settings subjected to periodic review and refinement.
- Regionally consistent approaches to stormwater offsets are preferable as they reduce regulatory burden on local authorities and the development industry.
- We support the further development of an offsets guideline, and believe Healthy Waterways is best placed to produce that guideline and undertake the necessary stakeholder consultation. Stormwater Queensland would like to be an active participant in the development of that guideline, having recently held a plenary panel discussion on this topic at the Stormwater Queensland Conference.
- It is our understanding that several Councils within Queensland are currently collecting (and previously collected) offset charges with little consideration to the principles outlined in this discussion paper – and not appropriately applying the very significant sums of money that have been accumulated. This is completely unacceptable and needs to be immediately resolved.

We thank you for the opportunity to provide input to the discussion paper and guidelines and hope to continue working with you to develop this critically important industry document.

Should you have any questions or would like to discuss the discussion paper or our submission specifically, please contact Paul Dubowski of the Stormwater Queensland Advocacy and Engagement Sub-Committee (p: 3831 6744 or paul.dubowski@bmtwbm.com.au).

Kind regards



Brad Dalrymple
President
Stormwater Queensland



Off-site Stormwater Quality Solutions Discussion Paper Feedback Form

Discussion Point 1 - Are there other key issues that should be considered?

Your Feedback:

1. One of the most challenging concepts local governments are faced with is to understand in what circumstances it is appropriate to accept offsets. For example:
 - a) should offsets be accepted for large scale greenfield development where limitations to design typically do not limit on site solutions?
 - b) are stormwater offsets appropriate for development sites that will remain in private ownership (e.g. commercial and industrial areas) – where any stormwater assets included would remain the responsibility of the site owner/ manager (and not Council).

It is suggested that a decision support tool which represents different decision pathways would be an important and beneficial part of the guidelines.
- c) Further to the above point, how should offset projects be prioritised? A decision support tool would be useful in assisting local governments prioritise offset projects.
- d) Any off-site solution must be backed up with a catchment management strategy developed by the local government. Council should have a plan for priority infrastructure including water quality to guide future development. Therefore a regional treatment measure may be identified that caters for a number of small developments can be identified early rather than numerous smaller ones for each individual development.
- e) The State Planning Policy (DEHP, 2014) focuses on integrated planning solutions. How can integrated outcomes be included in an off-site treatment scheme? The guidelines should provide further clarity on linking offsets with WSUD principles.
- f) The State Planning Policy (DEHP, 2014) effectively requires with load-based objectives or what is termed “best practice environmental management”. Are offsets considered “best practice environmental management”?
- g) What makes a waterway a sensitive receiving environment? While this is likely to vary between local governments, some guidance would be beneficial to try and encourage consistency and minimise misuse of offsets.
- h) If a waterway is rated as having low sensitivity due to degraded existing condition, does that ignore its restoration potential?
- i) While it is recognised that the paper focuses on load-based objectives due to the SPP, it would have benefited from discussion on alternatives such as no net increase or net environmental gain (offset ratios greater than one).
- j) Who is responsible for ensuring Council appropriately deliver offset solutions (with accumulated offset funding)? Is this organisation/ group able and willing to perform this role ?

Discussion Point 2 - Are Figures 3 and 4 useful tools for examining the merits of a range of stormwater management actions?

Your Feedback:



- 1) Further clarity is required regarding how some of the cost abatement figures were derived and therefore their relevance. For example, Table 1 and Appendix 1 provide good descriptions of how bioretention and wetlands were sized allowing direct comparison. Yet it remains unclear how most of the other management actions were sized. This becomes problematic where the curves could be used to justify investment decisions which lean towards swales for example. According to the figures, swales provide greater value than bioretention systems yet would not provide equivalent annual load reductions – a point which could be missed without a proper understanding of how the curves were developed.
- 2) Figure 3 is used to show the range in costs to remove TSS and allow a selection of a lower cost option. Although it is obvious, it probably needs to be broken up into comparable treatments. Rural treatments such as minimum tillage can't be compared against permeable pavement.
- 3) It is also worth noting that these measures individually may not be able to meet the SPP standards i.e. a swale shows a very low cost but a swale alone will not meet the policy and must be part of a treatment train.
- 4) The figures are useful in considering the abatement costs of WSUD but could mislead decisions makers. Specifically, the figures and associated text focus on costs without considering benefit. For example the third dot point (p18 does not account for the fact that the street tree is sized at 50% of target objectives which means that the investment would deliver half the benefit of typical bioretention. Similarly, the 7th dot point (p18) does not account for reduced water quality benefits and appears to suggest that cost effectiveness is related mostly to integration yet the reduction in land take is likely to be a key driving factor. Without further information on the assumptions used to develop the curves this could not be further considered in this review.
- 5) Further to the above point, if the 50% sized systems are to be presented in the guidelines, it is recommended further discussion is provided about these systems. Through discussion with the technical content authors it is understood that these systems are included:
 - a) to provide an option for developers which can only provide partial compliance with stormwater quality objectives (and offset the rest)
 - b) to provide an option for Councils where catchment planning supports smaller sized systemsThese points should be made explicit in the guidelines to ensure the figures are not misinterpreted or misused e.g. development applications with half size treatment areas citing this document as proof of a cost effective solution regardless of the predicted water quality impacts or proprietary systems that “don't need to perform” because natural systems are permitted to be undersized.
- 6) While there is value in developing cost abatement curves, in examining ‘merits’ it would be prudent to be more clear on the expected benefits. For example, could graphs be developed to assess the annual pollutant load from a typical bioretention system in a 1 Ha development and compare the equivalent \$/tonne pollutant/annum required to achieve an equivalent load reduction? Such graphs may also help to better account for differences in diffuse source runoff from different land uses.
- 7) Are the units correct in figure 4? Comparison of lifecycle costs but units are \$/Tonne TSS ? How can the operation and maintenance costs of a wetland with our without land costs be different? Isn't the land purchase costs included in the \$/tonne as part of the capital costs? Same for bioretention?
- 8) It is noted that some benefits were included in the lifecycle curves (e.g. value of water from rainwater tanks). Should the financial value of wetland and bioretention systems be considered (e.g. premium on property values)?
- 9) With channel erosion dominating the supply of sediment to Moreton Bay, channel erosion could also be better accounted for to provide for more informed investment decision making.
- 10) The figures could be useful in explaining treatment trains and to explain to developers.

Discussion Point 3 - Are there other management actions that could be considered for either on-site stormwater



management or for off-site stormwater solutions?

Your Feedback:

1. Wastewater treatment plan upgrades may be a useful comparison for local governments which retain ownership over these assets particularly those considering application of the *Flexible Options For Managing Point Source Water Emissions* (DEHP, 2014).
2. Other rural best management practices which have been monitored for performance and which could be considered are summarised in the report [Monitoring of Targeted Works to Reduce Sediment Export to Waterways Entering Moreton Bay](#) (Thomson et al, 2012).
3. Erosion and sediment control. Needs to be included to maintain dialogue and innovation regarding better ESC management practices.
4. Gross pollutant traps and other proprietary systems.
5. Filter strips.
6. Green roofs – if there is adequate knowledge on pollutant removal rates.
7. Better irrigation and fertilisation practices – if there is adequate knowledge on pollutant removal rates.
8. Purchase and/ or rehabilitation of land. For example, the acquisition of former farming or industrial wasteland and subsequent rehabilitation to a more 'natural' area.

Discussion Point 4 - Why do you think it is that low impact design and other cost effective onsite stormwater management actions are not used more regularly in Queensland?

Your Feedback:

Numerous reasons including the following:

- the domestic building market is geared towards slab-on-ground construction
- population growth shifting development to higher densities
- stairs are less attractive for people with young children or the elderly
- no new traditional Queensland style houses being built on stumps – too much maintenance?
- current trends are more towards patios, and entertainment areas and less gardens/turf
- except for in some master planned communities where developer covenants are used, developers can rarely control building design or materials
- builders recognise concrete as the default pavement solution
- rainwater tanks are perceived as cost prohibitive
- how do you demonstrate that your two storey home with 120m² footprint is a design response to meeting stormwater quality management objective and not just what you were going to build anyway?
- regulating reduced impervious after approval is difficult and there would be limited political will for enforcement
- development timeframes limit innovation
- bioretention if correctly constructed and maintained, continues to provide good performance per unit area. In most scenarios 'no land cost' or '50% treatment size' are not options so bioretention also continues to be a preferred solution. If done well, it can also add to the value of a development and the bigger developers are starting to embrace them



- end-of-pipe bioretention systems located within drainage corridors are generally perceived by developers to be the 'least intrusive' and cheapest solution
- current stormwater management (pollutant load removal) targets provide zero incentive to actually prevent the production of stormwater flow and pollutant loads (only the removal/ treatment of flows and loads that will be produced)
- perceived risks/ problems (e.g. safety, structural integrity) of 'different' approaches
- anticipated extended development assessment times and/ or difficulties associated with 'different' approaches.

Discussion Point 5 - Are there other management actions that could be considered for either on-site stormwater management or for off-site solutions?

Your Feedback:

Same question as Discussion Point 3. See above for response.

We have provided some further discussion on Figures 5 and 6 here as there is no other discussion point on these figures yet they lead to some of the most important findings of the paper.

1. Figure 5 and 6 would suggest that the land cost of onsite bioretention is equivalent to that of a regional off site large wetland. While it is acknowledged that this is related to different land unit rates used for the treatment devices, it is questionable whether the unit rates adopted are appropriate. For example it is more likely that on-site bioretention would be constructed on land purchased as a 'large development lot' (\$50/m²). Meanwhile, regional offsite wetlands would more likely be constructed on existing open space (no land cost) or where such sites have been exhausted, would require purchase of existing residential allotments (land cost \$300/m² + house cost?).
2. Further to the above point, if the land cost of onsite bioretention is lower, does that change the conclusion drawn in the fourth dot point on p19?

Discussion Point 6 - Do you think local government has sufficient capacity to deliver off-site stormwater schemes? If not, in what areas does capacity need to increase?

Your Feedback:

We don't believe local government currently have sufficient capacity to deliver off-site stormwater schemes. An increase in the resources would be required to develop appropriate catchment management plans and design and implement subsequent solutions –even if a portion of this work was to be undertaken 'in house'. External consultancy support would obviously assist in this regard.

This will vary greatly between local government authorities but in general it is expected that workload would generally shift from 'development assessment' branches to either 'works' and/or 'parks' branches. Individuals in these teams would need to be upskilled in either design or assessing outsourced designs. Council's would need to invest in developing catchment management plans to guide future development and potential off-site projects. They would also need to be upskilled in supervision of construction, establishment and asset register. Skills in the management of the offsets program would also be required for both the technical staff and accounts staff.

For most local governments, an offsets program would not result in a reduction in staff in DA (as they would still need to assess stormwater quality treatment systems where offsets are not accepted) but rather require additional staff in the relevant branches. An offsets charge should ideally account for the additional resources required to operate an offsets program including administration as has been successfully applied in other stormwater offsets schemes (e.g. Melbourne).



Discussion Point 7 - How would you establish a off-site stormwater scheme that achieved equivalence?

Your Feedback:

This is a very broad question but we have outlined a few suggestions of strategies which could contribute to a scheme which may contribute to the achievement of equivalence:

Environmental equivalence: As discussed previously, ensure that decision making tools account for annual loads and not just abatement cost as figures 3-6 currently do.

Spatial equivalence: Only accept upstream offsite solutions where supported by appropriate water quality modelling. Given many waterways cross local government boundaries, this may need to for part of a regional strategy.

Temporal equivalence: procure offset projects in anticipation of future offset developments. This would require a well thought out investment strategy.

Further to the above points, it is unclear at this stage at how practical the application of the logic outlined in Figure 7 will be in developing offsets strategies. To truly understand whether a waterway is a sensitive receptor would require receiving water quality modelling (based on accurate monitoring data) including an analysis assimilation capacity. Such an analysis is likely to be cost prohibitive for Councils so more simplified approaches may be required at the cost of lower certainty and greater risk. As noted previously, a decision support framework for determining sensitive receptor would be beneficial.

One alternative to modelling is to limit offset developments and offsets projects to the same sub-catchments. This may seem impractical due to spatial separation between greenfield areas and offset sites in existing urban areas but begins to make more sense if offsets are minimised in greenfield areas.

It may also seem impractical due to limitations in the number of available offsets project sites however historically, urban development is relatively homogenous (e.g. historically the same open space dedication policy existed across many local government areas for decades). The number of opportunities for offset sites are therefore likely to be similar between sub-catchments with similar land uses and development history and can also be managed through incremental charge increases as land becomes scarcer. These assumptions would need to be further tested in real catchments but help broaden the discussion on alternative ways to achieve equivalence and demonstrates the importance of carefully determining investment rules.

Discussion Point 8 - Is there anything that you would consider when setting off-site stormwater scheme charges that is not included here?

Your Feedback:

1. Equivalency ratios as per Section 6.2 of the discussion paper.
2. Uncertainty ratios e.g. to account for challenges in accurately measuring pollutant load reductions, the level of confidence in implementing offsets projects and other environmental/spatial/temporal uncertainties.
3. Could relative density ratios be used as a means to encourage avoiding pollutant generation through better design?
4. Possibility of mandating minimum design standards which compensate for 'lost' on-site WSUD benefits. Standards may include for example minimum streetscape shading, passively irrigated street trees, signage, improved water use efficiency etc.
5. Rather than basing an initial charge on large wetlands located on easy sites and penalising subsequent developers with increased charges as the easy sites become quickly exhausted, it would be more equitable



to set charges on the true cost of offset implementation.

6. Charge rate review timeframe.
7. Costs associated with the administration and management of off-set charges.

Discussion Point 9 - Is TSS a suitable metric for off-site stormwater schemes?

Your Feedback:

1. As development of a multi-parametric scheme would typically be beyond the capacity of most local governments, TSS appears to be a suitable solution.
2. If however, cost is the prohibitive factor in development of development of a multi-parametric scheme including water quality modelling, water quality monitoring and catchment planning, could initial off-site money collected be used for better planning and/or monitoring programs (rather than using an arbitrary metric)? If so, it is recognised that the research and development percentage of any set charge would need to be set low in order to be palatable at the political level.
3. If TSS is adopted as the metric, it is expected there would be a shortfall in compliance with nutrient objectives as TSS is typically easier to achieve using current modelling tools. This could potentially be addressed through equivalency or uncertainty ratios. This may however have planning implications that result in solutions targeting achievement of TSS removal and ignoring the nutrient targets.

Discussion Point 10 - Do the suggested principles include the major issues that need to be considered for a successful off-site stormwater scheme?

Your Feedback:

1. Some additional principles which would have been worth including are provided in [Mainstream Economics and Policy](#) (2011). These include for example, allocative efficiency, flexibility, community acceptance, participant acceptance etc.
2. See comments above regarding achievement of other WSUD objectives where offsets are accepted.
3. Need guidance on what is reasonable, technically feasible and cost effective as this will vary from site to site.
4. The statement “any approved off-site project needs to demonstrate the actions are additional to business as usual” requires further clarification.
5. Monitoring - why should an off-site solution be independently and transparently monitored and their performance evaluated any differently to an on-site solution particularly as both are equally important. While it is acknowledged that monitoring of offsets is typical in other offset schemes (e.g. vegetation offsets) it is often not enforced/implemented and may be particularly challenging for stormwater quality.

It would be useful if the guidelines provided some clarification on what is expected to be monitored in order to achieve the points outlined in S6.7. For example is it intended that in order to demonstrate environmental equivalency, stormwater quality monitoring of each treatment measure or receiving waterway would be required? How practical would this be for local government authorities? Moreover, who pays for the monitoring when developers are not typically required to undertake such monitoring and therefore attempts to include monitoring in an offsets charge is likely to be resisted by developers?

Discussion Point 11 - What issues need to be considered to ensure that procuring offsets in advance is feasible?



Your Feedback:

An assessment of land availability would be the most obvious first step. Land valuation would also need to be considered as purchase of private land may be required in catchments with limited existing open space. To enable procurement of land for future offsets, the offsets charge should account for land which may be zoned for urban purposes and have a higher land valuation compared to land zoned for open space/drainage. Either having the right science to know what sites to purchase (or accounting for uncertainty through equivalency or uncertainty ratios), should also be used to inform procurement.

Discussion Point 12 - Does the list of proposed inclusions for a successful offset scheme cover all relevant issues? Are there additional issues to consider?

Your Feedback:

Maintenance – S6.8 suggests that resources for maintenance should be included in an offsets scheme. While it is agreed that it may be appropriate to include maintenance resources in offsets charges for developments where a body corporate would otherwise be responsible for maintenance, this cost is not typically accounted for by the developer nor reflected in the sale price of land/structures. Similarly, the developer would not normally be accountable for the cost of maintenance resources located in public open space and therefore including maintenance resources in offsets charge in such scenarios may not demonstrate equivalency. Some further discussion and guidance on the relationship of maintenance resources and charges would therefore be worthwhile.

Further Feedback – Are there any further comments that you would like to make about off-site stormwater management solutions.

Your Feedback:

1. Offsets for greenfield areas – Melbourne Water have a workable policy worth considering on this topic. Catchment planning would be the most appropriate response to inform a local decision support framework.
 2. Clustering of offsets projects - could local governments 'cluster' 'small' bioretention systems and/or 'small' wetlands into a single larger catchment? If 'small' systems have been sized on the assumption that they are treating a larger catchment, this may miss the point that 'small' clustering could result in systems exceeding the point of diminishing return and fail to achieve the expected water quality performance.
 3. Lot scale offsets programs - could offsets payments be used to fund lot scale retrofit projects such as the Little Stringybark Creek program/fund or Melbourne's 10,000 Raingardens Program (acknowledging that these are quite unique schemes)?
 4. Reasons for considering offsets schemes – this addressed in S2.3, it would have been worthwhile acknowledging difficulties of treating stormwater in highly constrained sites .
 5. It is our understanding that several Councils within Queensland are currently collecting (and previously collected) offset charges with little consideration to the principles outlined in this discussion paper – and not appropriately applying the very significant sums of money that have been accumulated. This is completely unacceptable.
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