

A Review of the Status of Stormwater Quality Offset Collection and Implementation in Queensland

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In Queensland, stormwater quality offsets provide a mechanism whereby local governments collect voluntary payments from developers in lieu of complying with legislated stormwater quality management objectives on site. These local governments are subsequently responsible for utilising these funds to implement stormwater solutions that achieve a better or equivalent outcome external to the site.

To augment the appropriate collection and implementation of stormwater quality offsets within Queensland, the Department of Environment and Science (DES, formerly the Department of the Environment and Heritage Protection) prepared the “Draft Implementation Guidance for Off-site Urban Stormwater Management - Alternative locally appropriate solutions to support achieving the outcomes of the State Planning Policy State Interest Water Quality 2017” (the Guideline).

As outlined in Section 7 of the Guideline, appropriate evaluation, monitoring and reporting should be undertaken for the collection and implementation of voluntary financial water quality contributions ('stormwater quality offsets') collected in-lieu of complying with State Planning Policy stormwater management targets on-site.

Stormwater Queensland (SQ) sent all Councils within Queensland collecting stormwater quality offsets a correspondence requesting responses to a range of questions related to stormwater quality offsets.

Key findings from our assessment include the following:

- *A total of four (4) Councils within Queensland currently collect stormwater quality offsets (whilst the remainder of Councils currently choose not to);*
- *Three of the four councils that collect offsets responded to the survey questions;*
- *For the three Councils (Mackay Regional Council, Ipswich City Council and Logan City Council) that collect offsets and responded to the survey questions:*
 - *Significant funds have been collected in stormwater offsets;*
 - *The water quality benefits of solutions implemented with stormwater quality offset funds by Mackay Regional Council and Logan City Council are predicted to remove significantly more pollutants than would have been removed if on-site treatment was used (with compliance with State Planning Policy pollutant load removal targets);*
 - *The water quality benefits of solutions implemented with stormwater quality offset funds by Ipswich City Council are predicted to be almost as much for total suspended solids, total phosphorus and total nitrogen (but greater for gross pollutants) relative to that which would otherwise have been provided with on-site treatment (with compliance with State Planning Policy pollutant load removal targets);*
- *The four Councils that do collect offsets do not currently comply with some of the recommendations of the Guideline, including planning, spatial equivalence, environmental equivalence and reporting.*

It should however, be noted that the Guideline was only recently released (in September 2017).

It is Stormwater Queensland's position that Councils considering or collecting stormwater quality offsets should review Stormwater Queensland's (2016) Stormwater Quality Offsets Position Statement and the Guideline. It is also highly recommended that Councils that are currently collecting stormwater quality offsets but are unable to comply with the recommendations outlined in the Guideline should commence a review process that facilitates rapid alignment to these reference documents or consider immediately ceasing stormwater quality offset collection.

1. INTRODUCTION

1.1. Background

The State Planning Policy (SPP) (State of Queensland, Department of Infrastructure, Local Government and Planning, 2017) establishes water quality as a 'State Interest', to be managed through local government planning schemes. The commonly acceptable outcome for managing stormwater at the operational (post-construction), phase of a development is to demonstrate compliance with minimum reductions in stormwater pollutant loads through on-site treatment measures.

The Department of Environment and Science (DES, formerly the Department of the Environment and Heritage Protection) recently published the *Draft Implementation Guidance for Off-site Urban Stormwater Management – Alternative locally appropriate solutions (September 2017)*, which supports achieving the outcomes of the State Planning Policy State Interest Water Quality 2017 (the Guideline). Stormwater Queensland held consultation workshops on behalf of its members with DES officers regarding the draft offsets policies. Feedback from SQ members was collated and submitted to DES through its consultation process.

Section 7 of the Guideline recommends appropriate evaluation, monitoring and reporting be undertaken for the collection and implementation of voluntary financial water quality contributions ('stormwater quality offsets' collected in-lieu of complying with State Planning Policy stormwater management targets on-site). This could include the following items:

- Reporting the value of collected stormwater quality offsets;
- Reporting the location and type of off-site solutions delivered;
- Reporting the stormwater management benefits (e.g. pollutant load removed) of off-site solutions delivered.

1.2. Study Objectives

The purpose of this survey was to establish a 'baseline' in relation to the status of stormwater quality offset collection and implementation within Queensland. The study provides comment on existing practices highlighting key actions for Councils to achieve compliance.

2. METHODOLOGY

Stormwater Queensland (SQ) represents members across the stormwater industry, manufacturers, contractors, consultants and local authorities. For the purposes of this paper (and to augment best practice stormwater management within Queensland), SQ coordinated a centralised survey in relation to the current status of stormwater quality offset implementation at various Councils.

On behalf of SQ, the author sent correspondence to various Queensland Councils where the State Planning Policy 'Post-construction phase – stormwater management design objectives' apply. This correspondence requested responses to a series of questions to assess the current status of stormwater quality offset collection within each of these Councils.

The questions were as follows:

1. *To date, has Council previously collected stormwater quality offsets?*
2. *If 'Yes' to Question 1 ... To date, what is the value (\$AUD) of stormwater quality offset contributions received?*
3. *If 'Yes' to Question 1 ... To date, what is the cumulative pollutant load reduction obligation (by catchment) estimated to be achieved by these offsets?*
4. *If 'Yes' to Question 1 ... To date, what is the value (\$AUD) of projects implemented using stormwater quality offset contributions? Please include projects partially funded by offsets with distinction between proportion funded by offsets and other funding mechanisms.*
5. *If 'Yes' to Question 1 ... Can Council provide the details of projects implemented using stormwater quality offset contributions, including value (\$AUD), asset details (e.g. type, location, dimensions) and predicted pollutant load removal?*

6. Can Council please advise any key learnings for future offset collection and implementation?

The survey questionnaire was sent between 5 and 7 June 2018, with responses requested by 20 July 2018 (although some responses were provided after this date). Councils that did not provide a response were provided subsequent requests for responses to be provided.

3. RESULTS

3.1. Summary of Questionnaire Responses

Table 3-1 provides a summary of the responses to the questionnaire. Councils that are known or (from anecdotal reports) understood to currently collect stormwater quality offsets are highlighted.

Table 3-1 Summary of Responses to Questionnaire

Council	Response provided	Answer to Q1	Comments
Brisbane City Council	Yes	No	
Bundaberg Regional Council	Yes	No	Council intends to commence offset collection in the future.
City of Gold Coast	No	-	Anecdotal reports indicate Council does not currently collect offsets.
Gladstone Regional Council	No	-	Anecdotal reports indicate Council does not currently collect offsets, but has previously.
Logan City Council	Yes	Yes	Detailed response provided.
Ipswich City Council	Yes	Yes	Detailed response provided.
Mackay Regional Council	Yes	Yes	Detailed response provided.
Moreton Bay Regional Council	Yes	No	
Noosa Shire Council	Yes	No	Offsets not collected for various including additional admiration resource requirements for offsets and limited opportunities to collect offsets.
Sunshine Coast Council	Yes	No	Significant investigation works undertaken to date by Council to investigate whether it should implement an offset policy, but currently no policy enabling offset collection exists.
Toowoomba Regional Council	No	-	Anecdotal reports indicate Council currently collects offsets. However, Council advised that they do not have the information requested, and it would be unlikely they would be able to offer any firm figures
Townsville City Council	Yes	No	Council is in the process of developing a stormwater quality offsets scheme.

3.2. Summary of Mackay Regional Council Response

Mackay Regional Council (MRC) provided a detailed response to the questionnaire, which is appreciated by Stormwater Queensland. The following text provides a summary of this response.

MRC established a *voluntary mechanism for stormwater quality management* (the mechanism) in August 2014. Via this mechanism, MRC has collected \$1,246,524 from a total of 22 development applications within five creek and river catchments. Table 3-2 provides a summary of the average annual pollutant loads requiring offset via the MRC mechanism.

Table 3-2 Summary of Average Annual Pollutant Loads Requiring Offset via MRC Mechanism

Catchment	TSS (kg/year)	TN (kg/year)	TP (kg/year)
McCreadys Creek	223,344	1,210	366
Bakers Creek	413	3.82	0.77
Pioneer River	4,481	28.05	7.59
Janes Creek	522	2.85	0.86
Reliance Creek	11,815	64.25	19.49
Overall Total	240,575	1309	395

To date, the total value of projects implemented by MRC using the mechanism is \$870,000, which is a 70% spend of funds collected. Table 3-3 provides a summary of the projects implemented using funds collected via the MRC mechanism.

Table 3-3 Summary of projects implemented using MRC mechanism

Project	Details	Value (\$)	Predicted Pollutant Removal (kg/year)		
			TSS	TN	TP
On-farm improvement practices – McLennan's farm	Walkerston (Bakers Creek catchment). 150ha cane farm. 150 litre/year less herbicide applied to farm also predicted.	100,000	240,000	2,200	1,200
Stormwater quality management education	Erosion & Sediment Control Training. Installation of WSUD signage at Blacks Beach Cove (McCreadys Creek catchment) and Royal Sands (Reliance Creek catchment)	60,000	Unknown		
McCreadys Creek South Regional Wetlands – Detailed Design	Richmond (McCreadys Creek catchment). 4.8ha wetland. Detailed design only (not implemented to date). Project has been designed as per Living Waterways framework which has multiple benefits in addition to just water quality	200,000	0	0	0
Little McCreadys Creek Rehabilitation Project	Rural View (McCreadys Creek catchment) 700m long x 70m wide = 4.9ha	150,000	18,700	60	29
Goosepond Creek Revegetation Project	North Mackay – Pioneer catchment. 800m long x 15m wide = 1.2ha. Widening of existing riparian corridor. Although there would be some water quality benefit, the actual benefit has not been modelled.	50,000	Unknown		

Minor revegetation works at McCreadys Creek South Regional Wetlands	Richmond (McCreadys Creek catchment). 480m long. Small initial planting component to commence along Mackay-Bucasia road as per detailed design.	110,000	Unknown		
On-farm improvement practices – Mackay's farm	Walkerston (Bakers Creek catchment). Second 150-ha cane farm. Trials on the second farm have just commenced. Although the report has not yet been completed, pollutant load reductions are assumed to be very similar to McLennan's farm	100,000	Unknown		
Aeration device installation at the Gooseponds (to mitigate against fish kills and remove N)	North Mackay – Pioneer catchment. Although not modelled, Nitrification enables N to become available to plants and microbes. Without nitrification, denitrification does not occur. Denitrification converts N into gas (exporting N out of the wetland).	90,000	Unknown		
Stormwater education signage	Various	10,000	Unknown		
Total value for offset projects		870,000	258,700*	2,260*	1,229*
Total value for on-site treatment if offset collection had not occurred#		1,246,524	240,575	1,309	395

*: excludes the pollutant load removals potentially achieved where the predicted value of that removal is unknown.

#: predicted pollutant removal from Table 3-2

The results provided above indicate that offsets from the alternative works completed are predicted to remove significantly more pollutants than would have been removed if on-site treatment was used (despite not including the treatment performance of projects where the water quality benefits cannot be readily quantified). The results also indicate that the majority of this removed pollutant has come from a single project.

3.3. Summary of Ipswich City Council Response

Ipswich City Council (ICC) provided a detailed response to the questionnaire, which is appreciated by Stormwater Queensland. The following text provides a summary of this response.

ICC has had a mechanism for the collection of stormwater quality offsets through their *Implementation Guideline No. 24 – Stormwater Management of Council's Planning Scheme* since late 2012. ICC advised that their first contributions were received in 2014.

Council did not disclose the value of the offsets received. Table 3-4 provides a summary of the average annual pollutant loads requiring offset via the ICC mechanism.

Table 3-4 Summary of Average Annual Pollutant Loads Requiring Offset via ICC Mechanism

Catchment	TSS (kg/year)	TP (kg/year)	TN (kg/year)	GP (kg/year)	% of total contributions by Catchment
Black Snake Creek	6871.2	34.01	10.03	1008.27	3.66%
Bremer River	40,078.82	198.37	58.50	5,881.13	21.88%
Brisbane River	8,394.61	41.55	12.25	1,231.82	4.47%
Bundamba Creek	11,516.72	57.00	16.81	1,689.95	6.12%
Deebing Creek	4,072.50	20.16	5.94	597.59	2.23%
Goodna Creek	3,552.91	175.97	51.89	5,217.00	19.05%
Ironpot Creek	4,243.48	21.00	6.19	622.68	2.26%
Mihi Creek	9,483.80	46.94	13.84	1,391.64	5.10%
Sandy Creek (Camira)	3,726.43	18.44	5.44	546.81	2.05%
Six Mile Creek	45,134.41	223.39	65.88	6,622.98	23.43%
Woogaroo Creek	18,151.23	89.94	26.49	2,663.50	9.75%
Total	188,889	935	276	27,717	100%

To date, the total value of projects implemented using the mechanism is \$6,083,823. Table 3-5 provides a summary of the projects implemented using funds collected via the ICC mechanism.

Table 3-5 Summary of projects implemented using ICC mechanism

Project	Offset funds contributed (\$)	Other funds contributed (\$)	Total value (\$)	Predicted pollutant removal (kg/year)			
				TSS	TN	TP	GP
Ironpot Creek Stabilisation	103,975	-	103,975	10,170	2.9	0.5	-
Jim Donald Park Wetland & Harvesting	966,140		966,140	26,661	72.7	41.3	4,987.1
Redbank Recreational Reserve Wetland & Harvesting	358,022	291,783	649,805	4,667	76.58	12.7	2,143.3
Wallaby Ware Park Bioretention & Swale	201,900	-	201,900	3,613	18.6	5.4	614.0
Pollard Park Stabilisation & Infiltration Basins	624,737			33,000	79.0	48.8	9,148.0
Small Creek Channel Naturalisation – Stage 1	3,443,277	279,323	3,722,600	81,000.00	647.0	112.0	35,745.0
Franklin Vale Initiative Phase 1*	385,772	-	385,772	-	-	-	-
Total value for offset projects	6,083,823	1,453,126	7,536,949	159,110	897	221	52,367
Total value for on-site treatment if offset collection had not occurred (from Table 3-4)	Unknown	-	Unknown	188,889	935	276	27,717

*: Council is in the process of undertaking revegetation works on private properties within the Franklin Vale Creek catchment as part of their Franklin Vale Initiative (a stormwater quality offsets funded project). Owing to the incomplete status of the project, no pollutant reduction claims have been made for the purposes of water quality offsets reporting.

The results presented above show that the water quality benefits of solutions implemented with stormwater quality offset funds by Ipswich City Council are predicted to be almost as much for total suspended solids, total phosphorus and total nitrogen (but greater for gross pollutants) relative to that which would otherwise have been removed with on-site treatment (with compliance with State Planning Policy pollutant load removal targets). The results also indicate that a significant portion of this removed pollutant has come from a single project.

3.4. Summary of Logan City Council Response

Logan City Council (LCC) provided a detailed response to the questionnaire, which is appreciated by Stormwater Queensland. The following text provides a summary of this response.

The requirements for stormwater quality offset applications are outlined in LCC's (2015) *Planning scheme policy 5–Infrastructure*. Table 3-6 provides a summary of the value of stormwater quality offsets collected by LCC and the average annual pollutant loads requiring offset by LCC.

Table 3-6 Summary of Value of Stormwater Quality Offsets Collected and Average Annual Pollutant Loads Requiring Offset by LCC

Catchment	Total Contribution Collected (\$)	Total Area Offset (ha)	TSS (kg/year)	TN (kg/year)	TP (kg/year)
Oxley Creek	82,331	3.41	4 421	6.65	26..8
Slacks Creek	4,157,000	32.96	42 810	60.8	237
Overall Total	4,239,331	36.37	47,231	67	237

To date, the total value of offset projects implemented by LCC is \$4,682,000, which is 10% more than the value of offset funds collected. Table 3-7 provides a summary of offset projects implemented by LCC.

Table 3-7 Summary of projects implemented by LCC Using Offsets

Project	Details	Value (\$)	Predicted Pollutant Removal (kg/year)			
			TSS	TN	TP	GPs
Moss Street, Slacks Creek	Infiltration/ bioretention basin 1755m ² area (within Slacks Creek catchment)	155,000	2,420	20.3	2.94	N/A
Blackall Street Treatment System (Blackall Street, Hillcrest)	Sediment basin, macrophyte zone and bioretention basin. Stormwater contributions are being retrospectively replaced as developments connect into system. 75-ha catchment (within Slacks Creek catchment).	4,500,000	93,630	141.7	454	8,850
Underwood Industrial Area StormSack installations	Retrospective installation of thirty (30) StormSacks (within Slacks Creek catchment).	27,000	6,700	18.1	115	2,372
Total value for offset projects		4,682,000	96,050	180	572	11,222
Total value for on-site treatment if offset collection had not occurred (from Table 3-5)		4,239,331	47,231	67	237	N/A

The results provided above indicate that offsets from the alternative works completed are predicted to remove significantly more pollutants than would have been removed if on-site treatment was used. The results also show that the majority of this removed pollutant has come from a single project.

4. COMPARISON TO RECOMMENDATIONS OF THE GUIDELINE

Based on the aforementioned results (and discussions with stakeholders within and external to Council), the following aspects of the current status of offset collection and implementation have been compared to the recommendations within the guideline:

- Planning
- Spatial equivalence
- Environmental equivalence
- Evaluation, monitoring and reporting

The following text provides a summary comparison of these aspects. It should however, be noted that the Guideline was only recently released (in September 2017) and the vast majority of projects of both Mackay Regional Council, Ipswich City Council and Logan City Council have been implemented prior to the release of the Guideline. Addressing the following key criteria will assist Councils to achieve full compliance.

4.1. Planning

The Guideline states that “*off-site solutions should only be considered where it is demonstrated to be a superior outcome, or where it cannot be feasibly demonstrated on-site*”.

Based on the information provided by both Mackay Regional Council, Ipswich City Council and Logan City Council, it is likely that these Councils would be confident that off-site solutions have been a more superior outcome to on-site treatment. This appears evident in the “on-farm improvement practices” in Mackay Regional Council where a significant portion of the loads were estimated to be achieved at a fraction of the cost.

For the Councils that did not respond to the survey questions, it would be speculation as to whether they comply with this recommendation. It remains Stormwater Queensland’s position that offsets should only be collected where on-site stormwater treatment is either unlikely to be a superior outcome or cannot be feasibly integrated on site to achieve compliance with given stormwater quality objectives. The examples from Mackay Regional Council, Ipswich City Council and Logan City Council, provide evidence that this is possible.

4.2. Spatial equivalence

The Guidelines states that “*off-site solutions must be in the same catchment as the development site*”. Based on the responses to the survey, it would appear that Logan City Council largely complies with this recommendation, with the majority of offset funds collected and implemented within the Slacks Creek catchment. It would however appear that both Mackay Regional Council and Ipswich City Council do not comply with this recommendation.

Ipswich City Council advised that, for stormwater quality offsets, environmental equivalence is measured at the downstream boundary of the ICC local government area. It is anticipated that Mackay Regional Council have applied a similar strategy.

Considering that the Guideline has only been recently published, and the lead time for these projects, it would be anticipated that moving forward Mackay Regional Council and Ipswich City Council may include spatial equivalence into the Planning element of their strategy.

4.3. Environmental equivalence

The Guideline also states that “*planning for off-site solutions must demonstrate environmental equivalence and consider spatial, temporal, sustainability, receiving waters level of aquatic ecosystems protection and consultation requirements*”. The Guideline also includes an “off-site ratio”¹, with a minimum value of 1.5 to 1.

Based on the survey responses, it would appear Logan City Council complies with this ratio and that Mackay Regional Council also complies with this ratio for total nitrogen and total phosphorus loads (but not for total suspended solids), whilst Ipswich City Council complies with this ratio for gross pollutants only. It should however, be noted that Mackay Regional Council has predicted pollutant load removal rates significantly greater than would have been achieved by on-site treatment (assuming all potential on-site treatment would be successfully operating) even if the performance of initiatives, where the treatment performance is unknown, is excluded from the analysis.

4.4. Evaluation, monitoring and reporting

The Guideline states that “*implemented off-site solutions should be monitored and evaluated to demonstrate the on-going achievement of environmental equivalence. Annual reporting to Council and the community could consider summarizing:*

- *Location, size, type of development and in-lieu fees collected to implement off-site solutions*
- *Location and type of off-site solutions delivered*
- *Assessments to determine if the scheme has met Council’s strategic intent; and*
- *Any additional benefits achieved as part of the implementation of off-site solutions”*.

As far as Stormwater Queensland is aware, there has been no reporting by Councils to the community (or any other stakeholder group) specifically regarding stormwater offsets, monies collected and projects delivered. However, it should be noted that it is also our understanding that no Councils have been requested to provide this information. Nevertheless, all Councils that have responded to this questionnaire should be acknowledged – particularly the detailed responses provided by Mackay Regional Council, Ipswich City Council and Logan City Council.

This survey is considered an initial step to provide some industry evaluation, monitoring and reporting. It is considered that this process is vitally important to provide transparency and understanding of the benefits or shortfalls from various options to the wider industry. Stormwater Queensland sees this as a valuable tool in knowledge transfer for those attempting to efficiently facilitate an offsets policy.

5. DISCUSSION

The responses to the survey have indicated that, of the four Councils known to receive stormwater quality offsets, one Council (Logan City Council) currently complies with the recommendations outlined in the Guideline, whilst three do not – although (as noted above) the Guideline was recently released. It is considered that non-compliances with the Guideline could be addressed with internal updates by each Council relatively quickly.

Mackay Regional Council, Ipswich City Council and Logan City Council predict that they have (to date) achieved significant reductions in pollutant loads from their respective local government areas at significantly lower cost than would have otherwise been provided by on-site stormwater quality treatment – even if potential alternative on-site stormwater treatment devices were operating successfully. It should, however, be noted that in our opinion the opportunities for offset implementation within the Mackay Regional Council, Ipswich City Council and Logan City Council local government areas (to date) are likely to be have been significantly higher relative to other areas where

¹ DEHP (2017b) does not define “off-site” ratio, but DEHP (2017a) uses the terminology “offsets ratio”, and it is anticipated that this definition is applicable to “off-site ratio”. DEHP (2017a) defines “offsets ratio” as “*an amount in excess of the volume of pollutants that provides a buffer to account for the uncertainty in discharge removal efficiencies of the offset*”.

State Planning Policy pollutant load reduction targets are applicable for new development. The opportunities for offset implementation in more urbanised areas are likely to be significantly lower.

6. CONCLUSION

Stormwater Queensland undertook a survey on the current status of stormwater quality offset collection and implementation from Councils in Queensland. This assessment has shown that a total of four (4) Queensland Councils collect stormwater quality offsets, whilst three (3) responded to the survey questions.

For the Councils that do collect stormwater quality offset funds, a comparison was made to the recommendations of the recently released *Draft Implementation Guidance for Off-site Urban Stormwater Management - Alternative locally appropriate solutions to support achieving the outcomes of the State Planning Policy State Interest Water Quality 2017*. Responses to the survey appear to indicate that the four Councils collecting stormwater quality offsets do not currently comply with all of the recommendations within the Guideline. Nevertheless, based on the feedback information in the survey, the three Councils that responded to the survey questions have predicted via modelling significant reductions in stormwater pollutant loads.

Stormwater Queensland highly recommends that all local governments considering collecting stormwater quality offsets should review the *Stormwater Quality Offsets Position Statement (2016)* and the Guideline. It is also highly recommended that Councils that currently collect stormwater quality offsets but are unable to comply with the recommendations outlined in the Guideline should commence a review process that facilitates rapid alignment to these reference documents or consider immediately ceasing stormwater quality offset collection.

7. ACKNOWLEDGEMENTS

The author would like to thank all Councils that responded to this survey, and all Council staff and Stormwater Queensland Committee members who provided valuable input in the preparation of this document.

8. REFERENCES

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