

Frequently Asked Questions Water Sensitive Design Chapter (Chapter 11) of the Great Lakes Development Control Plan

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1. What is Water Sensitive Design?

Water Sensitive Design is an approach to development and re-development that integrates the whole water cycle into the design (stormwater, groundwater, waste water and water supply). This approach improves water quality and manages the volume of water leaving a development, reduces our overall demand on water sources and minimises the pollution entering our waterways.

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2. Why do we have Water Sensitive Design in the DCP?

The Great Lakes community values the health of our waterways with a high expectation for Council to protect those waterways. One of the key directions of Councils' community strategic plan is '**Our Environment**' the objectives of which are to '*Protect and maintain the natural environment*' and to '*Ensure that development is sensitive to our natural environment*'.

We are committed to reducing the impact of stormwater by using Water Sensitive Design (WSD). Scientific research conducted in the Great Lakes area has shown that if we continue to develop areas without careful consideration for the impact of stormwater on water quality we will see a decline in the overall health of our waterways.

In 2009, Council adopted the Great Lakes Water Quality Improvement Plan. The plan recommended that Council set water quality targets for new and re-development within the DCP to protect the health of our waterways.

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3. When did the water sensitive design DCP start?

The Water Sensitive Design DCP commenced for large scale developments in January 2012 and small scale development in July 2012.

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4. Why do we need to treat rainwater? Isn't it clean?

In an undeveloped area, rainfall soaks into the ground, is used up by the plants through evapotranspiration, and runoff would only be generated a handful of times throughout the year.

When an area is converted from natural vegetation to urban development, the ground is covered with hard surfaces such as driveways, roofs, roads and footpaths. In these developed areas, runoff is generated nearly every single time it rains. This runoff can contain pollutants such as nitrogen, sediments, phosphorus, heavy metals and pathogens. Nitrogen is a nutrient that occurs naturally in rainfall and in a natural situation would be used by plants to grow.

When stormwater is not used up by natural vegetation and is fast tracked to our waterways by roads, paths and building, the nitrogen in rainfall can fuel algal blooms. Algal blooms stop light from reaching marine plants which need sun to survive. Marine plants are the foundation for a healthy system providing habitat for fish and macroinvertebrates which in turn support local fishing, oyster and tourism industries.

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5. Can Council build a big rain garden to treat stormwater rather than lots of little ones on individual lots?

We've built 9 large water quality gardens on public land since 2009. These gardens help to improve the water quality of our lakes. To continue to protect and improve water quality it is important to capture and treat stormwater on all new developments as well.

When a new area of land is released, we negotiate with developers to construct large scale water quality treatments. This means that only minor water quality treatment is needed on individual blocks (such as rainwater tanks).

Raingardens on individual lots are an important part of the bigger picture of water sensitive design. There is no single solution to the issue, so we need to use a variety of treatments. When combined with large public raingardens and treatments on new subdivisions, raingardens on individual lots are crucial to the collective effort of improving the quality of stormwater entering local waterways.

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6. Why don't we focus on water quality treatment in large subdivisions rather than on individual houses?

All new large developments and subdivisions are also required to comply with the water quality DCP. These developments are to meet neutral or beneficial effect targets, this means that the new development will have no new impacts on the water quality of our waterways.

If Council were to only focus on large developments to meet the water sensitive design objectives, catchment and estuary modelling has shown that we would still see a decline in water quality of our lakes. Council also receives a higher volume of small development applications when compared to large ones. As infill development continues in our urban areas, each individual house contributes nutrients and other pollutants to our waterways. Unless water sensitive design measures are put in place at both the small and large scale we will not be able to protect our waterways from water quality impacts.

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7. What about rural areas like farms, what do they need to do?

Council and Karuah Great Lakes Landcare have been working with farmers to help them achieve Sustainable Farming practices. The idea is that with a sustainable approach they will be able to manage their farms to increase groundcover and

reduce nutrient application, thereby reducing the amount of sediment and nutrients reaching our waterways.

Putting effort into reducing nutrients across both urban and rural areas is important for achieving overall lake health. The collective effort in both rural and urban areas is the best approach for achieving these improvements.

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8. What about all of the other houses that have been built? My building won't add much?

Everyone who has had their house approved after Chapter 11 of the Great Lakes DCP was adopted in 2012 is required to meet the water quality targets by re-using rainwater and constructing raingardens. There is a lot to be gained when all of these small contributions are added up. It is estimated that by constructing raingardens, swales and including rainwater tanks on these small scale developments (to end of 2015) we have stopped 67 kilograms of total nitrogen, and 6 kilograms of total phosphorus being deposited in our waterways each year. This is the equivalent of keeping 320, 17.5 kilograms bags of dynamic lifter out of our waterways annually.

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Where the Water Sensitive Design Chapter of the DCP applies

9. Does Chapter 11 of the DCP apply to complying development?

Yes. The State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, Reg 3.32, Part 2b states that *"if an approval is not required under section 68 of the [Local Government Act 1993](#), comply with any requirements for the disposal of stormwater drainage contained in a development control plan that is applicable to the land."*

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10. Does Chapter 11 of the DCP apply to additions and alterations?

Yes, additions and alterations for large scale development (lot size greater than 2000m²) and all commercial and industrial developments are required to comply with the Water Sensitive Design chapter of the DCP. An addition or alteration is any development where the impervious area of the existing development increases by 10% or greater in the proposed development. Additions and alterations on individual houses and dual occupancies are not required to meet the water quality objectives at this stage.

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11. How do I figure out what I need to do on my property to meet the requirements of Chapter 11 of the DCP?

For individual houses, there are two ways to work out what is needed to meet the water quality targets in Chapter 11 of the DCP:

1. Deemed to comply tables (contained in the DCP), or
2. Small scale stormwater model www.S3QM.com.au

For dual occupancy, multiple dwellings, industrial or commercial development if the lot size is under 2000m² the small scale stormwater model should be used to identify the treatments required. An exception to this is where the lot size is under 2000m², but the proposed development is a high density or multiple dwellings (villas, units etc). This may trigger the requirement for a MUSIC model to be prepared. For large scale development (greater than 2000m²) a stormwater strategy is required. The stormwater strategy is to be based on the results of detailed stormwater modelling (MUSIC).

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12. Is there a simple way to work out how big raingarden should be?

Yes. If you are building a single dwelling you can use [deemed the comply table](#) contained in the DCP. This table will help you work out how big your raingarden will need to be based on your lot size, roof area, and rainwater tank capacity. There are specific situations when you can use this table (see below) and if your site does not meet these requirements or if you want to obtain a more specific raingarden size then you will need to use the [Small Scale Stormwater Model](#) to size your raingarden.

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13. In what situations can I use the deemed to comply tables to size my water quality treatments?

The deemed to comply sizing table can only be used when:

- a minimum of 75% of the roof area is directed to the rainwater tank
- water from the tank is being used outdoors, in the toilet and the laundry
- roof water that does not flow to the tank is directed to the raingarden
- the driveway is connected to the raingarden
- the rainwater tank is the same size as that specified in the deemed to comply table.

If your development cannot meet these requirements, you will need to use the small scale stormwater model (www.s3qm.com.au) to work out the best treatment options for your site. There is a simple ['How to'](#) guide available to help you work through the model.

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14. Where should I start when designing a raingarden?

The best place to start when designing a raingarden is to evaluate the opportunities and constraints on your building site. Things that will influence the way your garden is designed and where it is located include:

Terrain - steep or flat: terrain will influence the details of your raingarden design. Depending on the steepness of a site your design may require energy dissipaters prior to or within the raingarden or it could be designed as a cascading garden. If the site is very flat you may need to consider designing a raised garden bed in order to have enough fall to get your underflow drains to exit at the street.

Soil Type - sandy, clay, groundwater levels: soils will influence the type of raingarden you will be able to design. A simple technique for working out soil type is included in the Great Lakes DCP (11.8.2). If your soil type is sandy then you will be able to construct an infiltrating raingarden that allows the treated water to soak into the sandy soil underneath the raingarden. If your site has high groundwater (groundwater within 700mm of the ground surface) infiltration will be ineffective and alternative approaches will be required.

If your soil type is clay, then your raingarden will need underdrains that collect the treated water which then drains into the main stormwater system.

Easements - stormwater, sewage: raingardens cannot be built on easements

Infrastructure - water services, phone lines: infrastructure will need to be avoided when locating your garden

Existing vegetation - mature trees, landscaping: mature trees may result in shading, excessive shading of a raingarden will compromise the growth of the plants, shady areas should be avoided as should the roots of vegetation that will be retained. Further information on distances required to protect trees are included below. It is ideal to consider where landscaping will be included on your property so that raingardens can be integrated into the design of your garden.

Future building - house, veranda, garage, pathways, driveway: your raingarden should be situated to collect the maximum amount of stormwater from all of the hard surfaces on your property; this would generally be downslope of the developed areas.

Take a look at the example drawings for raingardens and infiltrating raingardens available from [Council's website](#) these will give you a good idea of the features required in your design. These drawings can be used as a basis for your detailed design.

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15. What do I need to think about when choosing the best location for my raingarden?

Generally, your raingarden should be situated in the lowest point of your property to collect the maximum amount of stormwater from all of the hard surfaces (driveway, roof runoff, tank overflow, pathways). However, this cannot always be achieved so the next best position should be considered.

Shady areas should be avoided as excessive shading of a raingarden will compromise the growth of the plants. It is best to situate your raingarden on the Northern Side of your property or in a sunny position.

You should also consider a location where there is enough fall to enable the raingarden to drain properly from the top of the garden to the stormwater connection. For raingardens in clay soils, this is a minimum of 800mm. In sandy soils it is less, but should achieve at least a 1-5% slope on the outlet pipe.

It is ideal to consider where landscaping will be included on your property so that raingardens can be integrated into the design of your garden. This will add to the aesthetics of your property.

The structural root zone and tree protection zone of trees that will be retained in the development should be avoided when locating the raingarden. Details on distances required are outlined in the Australian Standard AS4970-2009, '*Protection of trees on development sites*'. As a rule of thumb, the area required to avoid both of these zones is the diameter of the tree at breast height (1.4m) x 12. If there is any excavation within either of these zones further input from an arborist is required.

Other considerations are detailed in the answer above '*Where should I start when designing a raingarden?*'

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16. How much elevation do I need from the overflow of my rainwater tank to the outlet at the kerb and gutter?

In situations where you are not able to infiltrate (where the soils are not sandy) you will need to have 800mm of elevation from where your rainwater tank overflows into the raingarden and the invert of the kerb and gutter, roadside pit or inter-allotment drainage

Mid Coast Council's [example cross section](#) for a raingarden provides the details of what is included in the raingarden profile explaining need for 800mm of elevation.

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17. What if my house block is really steep?

If your house block is steep it may be necessary to slow the velocity of stormwater down before it reaches your raingarden. Slowing the velocity of stormwater can be achieved with a range of approaches depending on the specific conditions at your site (energy dissipaters, check dams, pits). If the slope from your rainwater tank outlet/roof runoff to the raingarden is greater than 10% we may ask for an energy dissipater to be designed and installed.

There is also the option of designing a cascading raingarden with the total treatment area divided among a number of smaller gardens that flow into each other. You also have the option to build a raised garden if excavating into steep slopes is difficult. The raised garden may be integrated into any retaining walls that will be built on the property.

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18. What could I do if my house bock is really flat and there is not enough elevation to drain my raingarden to the street?

If you have sandy soils you will be building an infiltrating raingarden that doesn't require underdrains, and therefore doesn't need as much fall to get to the street. See the cross section for an [infiltrating raingarden](#) to see how this works. The overflow pipe will generally be able to connect to the stormwater system.

If you have clay soils you will be building a raingarden that requires a minimum of 800mm fall so you may consider the following options if your site is flat:

- If you are in close proximity to a Council stormwater pit you may be able to connect your raingarden outlet pipe into the side of the pit
- You can design a planter box style raingarden where the majority of the raingarden is constructed above the ground (example photograph shown in Fact Sheet 18).

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19. What options do I have if I have clay soils?

On a typical house site with clay soil, a combination of rainwater tank and raingarden will be required.

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20. What options do I have if I have sandy soils?

On a typical house site with sandy soil, a combination of rainwater tank and an infiltrating raingarden will be required. Infiltrating raingardens allow water to infiltrate into the underlying sands. An overflow pipeline to the stormwater system is still required.

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21. When I build an infiltrating raingarden do the sides need to be lined?

Yes. In sandy soils the sides of the infiltrating raingarden need to be lined so that stormwater travels down through the filter material and not out the sides into the surrounding sands. The sides should be lined to a minimum depth of 200mm below the depth of the filter material (to a total of 600mm depth). The liner needs to be impermeable (HDPE or equivalent). The bottom of the infiltrating raingarden should be left free draining into the sandy sub-soils.

If the infiltrating raingarden is located along the property boundary or less than 2m from the house, driveway or other infrastructure the liner is to extend 600mm below the depth of the filter media (to a total of 1m from the natural surface).

If the garden is located along a property boundary additional protection is required - a kerb or similar permanent water tight structure is to be constructed along that same boundary to ensure stormwater does not flow into the adjacent property.

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22. What if there is groundwater at my site?

If your site has high groundwater (groundwater within 700mm of the ground surface) infiltration will be ineffective and alternative approaches will be required. If you believe high groundwater will be a problem at your site this should be investigated further through geotechnical assessment.

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23. What if my lot size is greater than 2000m² but I'm only building a house?

Generally you can use the development footprint as the lot size when working out what size treatment is required. The development footprint is the amount of land disturbed by the development including the house, house yard, driveway and other hard surfaces such as garages, decks and paved area. The development footprint is the area of land which needs to be modelled and treated by the water quality treatments you decide to put on your development.

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24. Can I build my raingarden in the property setback?

Yes, provided there are no easements for services located in the same area.

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25. If I increase the size of my rainwater tank will it mean I don't need a raingarden?

No. It is extremely unlikely that if you increase the size of the rainwater tank that no other treatments will be required. You will be required to have a minimum rainwater tank size as part of your BASIX assessment. You have the option of increasing the tank size from that specified in your BASIX certificate to achieve a smaller raingarden. You can look at the options in the deemed to comply table to determine how the size of raingarden changes in relation to tank sizes.

Alternatively, you can run a variety of tank sizes through the S3QM model. As a rule of thumb, the larger the tank, the bigger the area of roof collected, and the greater the use of the rainwater within the home, the smaller the raingarden will need to be. If you wish to install a tank size that is different from those included on the deemed to comply table you will need to use the small scale stormwater model.

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26. If I have no sewer or water do I need to comply with the water quality section of the Great Lakes DCP?

Yes, however as you will most likely be collecting 100% of your roof area in a large rainwater tank and using this throughout the home, there will be very little tank overflow reaching the stormwater. In these cases, if a minimum of 75% of the roof water (usually it is 100% if you're not connected to town water) is directed to your tank and the overflow from the tank and other hard surfaces is dispersed across the landscape in a controlled way then you will meet the requirements of Chapter 11 of the DCP, examples include swales and cross fall on driveways to the surrounding landscape areas.

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27. Can I build my raingarden / infiltrating raingarden in the sewer or stormwater easement?

No. Water quality treatments cannot be constructed within drainage or sewer easements (except for privately owned interallotment drainage) and private open spaces.

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28. What evidence do I need to provide about my soil type if I choose an infiltration raingarden as an option?

If you wish to build an infiltrating raingarden you will need to demonstrate that your house is being constructed on sandy soil. You can provide this information from other documents such as subdivision geotechnical reports, or NSW government soil and land information databases such as [eSPADE](#). If none of this information is available for your site you can provide your own assessment of soil type using the guidance on testing soil texture included in the appendices of Chapter 11 of the DCP (11.9.2).

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29. If my house is part of a subdivision where there are large water quality treatments already constructed, do I need to comply with the water quality part of the DCP?

If your house is being constructed on land that has been subdivided since 2014 it is typical that it has been included in a subdivision scale stormwater strategy. You need to contact Council to find out if a stormwater strategy has been developed for your subdivision. If this is the case, it is likely that there will be minimum requirements (e.g. rainwater tank) for treatment of water quality on your individual block, usually these requirements will be outlined on the [88B](#) instrument for your land.

In some cases, there will be developments where there are large water quality treatments in the development but you will still be required to meet the requirements in Chapter 11 of the DCP. In these situations, the subdivision would have been approved prior to Chapter 11 of the DCP being in place. This means that the treatments that were designed into your subdivision are to a lesser water quality standard and therefore individual houses still need to contribute to water quality improvement.

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30. What is the filter media made up of?

The filter media in raingardens is a sandy loam. [Fact Sheet 16](#) outlines what the filter media is made up of. Most local landscape suppliers can provide you with certified filter material to make it easy to construct your garden. You will be required to provide certification upon final inspection.

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31. Can the raingarden area be included as part of the landscaping ratio for the property?

Yes, the raingarden does count as landscaping when calculating this ratio.

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32. Is the rainwater tank required by this DCP in addition to the tank required on my BASIX certificate?

No, the tank is not additional. In most cases you can keep the same size tank as BASIX requires. It may be that you will choose to use a slightly larger tank in order to achieve greater water quality improvements or a smaller raingarden size.

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33. What separation distances are required between my raingarden and my building? What separation distances are required between my raingarden and neighbouring property? What can I do if am within these distances?

The separation distances required are determined by your soil type:

Sandy Soils: If you are building on sandy soils the separation distance between your building and/or your property boundary should be a minimum of 2m. If you would like to construct your raingarden within these separation distances on sandy soils you will be required to include an impermeable liner (HDPE or equivalent) that extends 1m below the finished surface level or existing surface level (whichever is lower).

Clay Soils: On clay soils the separation distance should be a minimum of 5m. If you would like to construct your raingarden within these separation distances on clay soils, you will be required to line the base and sides of the raingarden with an impermeable liner (HDPE or equivalent) so that the garden is sealed.

If you would like to construct your raingarden hard up against your building, then certification is required by a suitably qualified engineer or equivalent to ensure that all proper controls have been put in place to prevent any damage to the dwelling. This applies in all soil types.

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34. Will I need to look after my garden once it is completed?

Yes, there will be some maintenance for your raingarden although they are relatively easy to maintain.

- For the first few weeks, you will need to water the plants to get them established
- Weed as necessary
- Remove sediment build up in the overflow pipe by flushing it with a hose periodically
- Prevent the filter media from being compacted and plants from being crushed by vehicles or foot traffic
- Replace plants if they do not survive.

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35. What will happen if I don't maintain my raingarden or if I fill it in after I build my house?

Constructing and maintaining your raingarden is a condition of consent for your development. The condition remains in place in perpetuity unless modified by an application to modify the consent (section 96). Council has the authority to inspect the rain garden at any reasonable time.

If it is found that the rain garden has not been maintained, has been removed or modified from the plans submitted and approved, Council have several options available to enforce compliance:

1) You will be served an order to bring your rain garden up to the standard as approved in your development application. (Environmental Planning and Assessment Act 1979)

2) Council can also issue on the spot penalty notices of \$3000. The Short title and Penalty Notice amount for this offence is "Development not accord consent - any other case - Individual" - \$3000. **EP&A Act 1979 Sec. 76A (1)(b).**

3) For noncompliance of an Order, Council can issue a Summons for the matter to be heard in the Land and Environment Court NSW, initiating class 4 proceedings, seeking court orders to comply with the Development Consent and an application for the Defendant to pay Councils costs in the proceedings.

4) Noncompliance of the court orders may result in contempt of court proceedings being initiated.

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36. Will my raingarden cause mosquitos?

No. Raingardens drain within a few hours so which means that if any mosquito eggs are laid in the ponded water in the raingarden, they will die when the water drains away.

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37. How do I stop weeds from getting into my raingarden?

If your garden has been planted densely with plants then once they grow there will be little opportunity for weeds to establish. There is also the option of adding a heavy mulch such as small rocks providing the planting densities are in accordance with the approved plans and conditions.

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38. How long do the raingardens hold water?

Depending on the length of the rainfall event, raingardens will only pond for 3-6 hours. Make sure you use the correct filter material and plants, and that the under flow drains are not blocked. This will ensure your garden drains quickly.

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39. What are the processes for public education, maintenance and inspections of WSD measures, post development?

There is no single solution for making sure that raingardens continue to function and comply with the DCP once the final approval has been given. Council have multiple strategies to address this issue, these are listed below.

- Maintenance information for owners - once your raingarden has been constructed and the plants are established, maintaining your raingarden is relatively easy. We have prepared some information in Fact Sheet 18 to assist homeowners to keep their raingarden alive and healthy
- Engaging with designers and builders - a well designed and built raingarden that integrates into the landscaping is key to ensuring the longevity of the garden and reduce the probability of owners wanting to change them or fill them in after they have been constructed and approved. Council have been working with designers and builders to encourage this integration.
- Responding to complaints and concerns of residents that are affected by a raingarden that has been changed after final inspection. The owners of the raingarden that has been 'changed' will be required to restore it to the approved design.
- Audits - Council conduct random audits of treatment systems. If we find that a raingarden has been filled in, removed, planted incorrectly or changed from the approved plans, we will contact the owner and advise them that they need to restore the raingarden back to the approved design.

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40. What is the S3QM?

The S3QM is a small scale stormwater model. This model is a web based tool and can be used on small scale development (less than 2000m²) to work out what water quality treatments are required to meet the targets in Chapter 11 of the DCP. The model provides the flexibility to design your own set of water quality treatments that will suit the design of your development. The model is available at www.S3QM.com.au.

As the S3QM tool is a national system, Council has developed a 'How To' guide that takes you through how to use the model step-by-step. The guide can be downloaded [here](#)

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41. When should I use the S3QM?

The S3QM will need to be used for commercial development and multiple dwellings where the lot is less than 2000m². The S3QM should also be used if you are designing an individual house and wish to have more flexibility in the way you design your water quality treatments. It is also required when you are unable to meet the requirements for using the deemed to comply table (which are listed below):

- a minimum of 75% of the roof area is directed to the rainwater tank
- Water from the tank is being used outdoors, in the toilet and laundry
- Roof water that does not flow to the tank is directed to the raingarden
- Minimum of 50% of driveway and other impervious surfaces are directed to the raingarden
- The rainwater tank is the same size as that specified in the deemed to comply table.

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42. There are a number of options for water quality treatment in the S3QM, which of these can be used in my development?

An arrangement of rainwater tank/s where the water is used within the home, with the overflow from that tank and the driveway area being directed to the raingarden (biofiltration) will be the most effective combination of treatments to meet the water quality targets in Chapter 11 of the DCP. There are other options in the S3QM that are supported by Council in development applications and these include:

- Biofiltration - both raingarden (clay soils) and infiltrating raingarden (sandy soils) will use this option in the model
- Swale

There are other options in the S3QM that are generally not supported by Council, however if you are unable to make the preferred options work on your development, other treatments may be supported on a case by case basis.

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43. When I am designing a raingarden to infiltrate into the sand what treatment do I use in the S3QM?

You should use the biofiltration treatment.

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44. When do I use catchment A and B in S3QM?

In most cases, you should be able to get your block draining to a single point, but in those cases where you can't, the tool allows you to break your lot into two catchments (A and B). For example, you may wish to designate two areas for treatment because some of your block slopes to the front and some to the back. Another example of when you may wish to have two catchments is when there is a section of your property you will not be able to treat. Using two catchments will help you work out if you exclude part of the property from treatment if you can still meet the water quality targets in the DCP.

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45. In which situations do I tick 'DCIA & pervious area' box on the model?

You tick the DCIA & pervious area box in the model when the remaining impervious area (such as the driveway) will reach the treatment you have specified.

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46. What rainfall region do I select on the model?

Taree

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47. What water quality assessment type do I select?

For small scale development you need to select 'TTE' which stands for Treatment Train Effectiveness. This means that you only need to achieve the water quality targets for small scale development.

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48. What assessment method should I select?

You need to select 'Design'

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49. What water quality targets should I enter? (Treatment Train Effectiveness % Reduction)

Total Suspended Solids (TSS) (%) 80
Total Phosphorus (TP) (%) 60
Total Nitrogen (TN) (%) 45
Gross Pollutants (GP) (%) 90

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50. In a commercial development how do I calculate water use if I have a toilet plumbed to the tank?

For each toilet include 1 bedroom in the model.

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Developing a Stormwater Strategy

51. What is a MUSIC Model?

MUSIC stands for Model for Urban Stormwater Improvement Conceptualisation and this is a computer based stormwater model. MUSIC can model a wide range of treatment devices to find the best way to capture and reuse stormwater runoff, remove its contaminants, and reduce the frequency of runoff. MUSIC helps you to evaluate these treatment devices until the best combination of cost, hydrology and water quality improvement is achieved.

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52. When will I be required to use a MUSIC model?

A MUSIC model is required when the proposed development is greater than 2000m², or if the development is less than 2000m² and is high density. Council Officers can request a MUSIC model if the development is on a site less than 2000m² but is of a complexity or density that requires detailed modelling.

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53. Are there any guidelines for how to set up my model?

Yes. When setting up the parameters in the model the most up to date information is contained in the document ['Using MUSIC in Sydney's Drinking Water Catchment'](#).

For information on how to set up the rainfall dataset for our region refer to the ['Draft NSW MUSIC modelling guidelines'](#).

Any MUSIC model submitted to Council should be developed by a qualified practitioner.

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54. What do I need to provide with my development application to comply with Chapter 11 of the DCP?

Council have developed check lists for [small](#) and [large](#) scale development which outline the specific information required to be submitted with your application.

When submitting your application you will need to include the following details on your plan:

- Location of the treatment in plan view (e.g. raingarden)
- Area of roof connected to the rainwater tank
- Area of roof connected directly to another treatment (e.g. raingarden)
- Rainwater tank location, stormwater downpipes and other connections to the treatment area (e.g. raingarden)
- Cross section of the raingarden including depths of the filter material and levels on the inlet and outlet drains
- If the deemed to comply table is used, include a summary of the roof size and block size
- If the small scale stormwater model was used, include the certificate.

Example plans are provided on Council's [website](#).

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Other

55. Can I use my water quality treatments to meet the stormwater detention requirements for my development?

If you're proposing a development larger than a house, then you may be required to provide on-site stormwater detention as part of your development. When used in sandy soils the raingardens can help offset Council's on-site detention requirements. Check with Council's Transport Assets Section to see if onsite detention is required for your development, and to discuss some options available to you to integrate the treatment requirements with the detention requirements.

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