



Stormwater Quality Improvement Device Evaluation Protocol (SQIDEP)

VERIFICATION CERTIFICATE

Applicant Information

Applicant Name	Ocean Protect Pty Ltd
Applicant Address	60 Lyn Parade, Prestons, NSW 2170
Website	www.oceanprotect.com.au
Contact Email	bradd@oceanprotect.com.au

Verified Technology

Product Title	StormFilter NPSorb
SQIDEP Pathway	Body of Evidence Pathway
Reviewed Documents	The following documents form the basis of this independent evaluation: - Dalrymple B, Wicks M. (2024). <i>Performance report for SQIDEP review – StormFilter NPSorb</i>. Prepared on behalf of Ocean Protect. - Supporting information for the StormFilter NPSorb technology monitoring at the study site at Western Sydney, including plan and section drawings, site photos, sample receipt notifications, chain of custody documentation, certificate of analyses, individual storm reports, and monitoring equipment calibration and maintenance logs. - Statutory declarations from Ocean Protect personnel. - Photos of other StormFilter technology installations. - Dalrymple B, Wicks M. (2021). <i>A review of the application of StormFilter® in Australia</i>. Prepared on behalf of Ocean Protect. - Ocean Protect (2019). <i>StormFilter® Operations & Maintenance Manual</i>. - Ocean Protect (2020). <i>StormFilter® Technical Design Guide</i>.

Technology Information

Applicant's Verified Performance Claims (ER)	Total Suspended Solids (TSS) 87 % Total Phosphorus (TP) 72 % Total Nitrogen (TN) 65 % Gross Pollutants 100 %
Test Stormwater Runoff	The presented runoff pollutant test results complied with the SQIDEP typical stormwater pollutant concentrations for urban environments. The device has therefore been tested within the pollutant loading ranges specified by SQIDEP v1.3 for typical urban environments (e.g. urban roads, residential, industrial, commercial).
Test Catchment	Commercial
Maintenance Performed during monitoring	• Zero servicing or maintenance of the StormFilter NPSorb system at the study site was undertaken following the installation of the StormFilter NPSorb cartridges in April 2021 until after the last sampling event (in March 2023). Only visual inspections of the system were undertaken. • The StormFilter NPSorb system at the study site has been maintained in accordance with typical/ standard maintenance procedures for these assets, as described in the Manufacturer's guidelines.

Verified method to model in MUSIC

Modelling a StormFilter NPSorb technology in MUSIC is as follows:

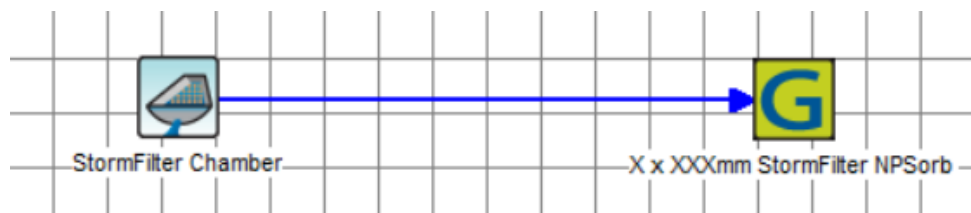


Table 1 – Summary of StormFilter NPSorb cartridge dimensions

Parameter	Cartridge name/ siphon height		
	690	460	310
Physical height (mm)	840	600	600
Typical weir height from outlet (mm)	920	690	540
Treatment flow rate (L/s)*	1.60	1.10	0.70

*: Treatment flow rate based on StormFilter NPSorb technology applied at study site.

Use the detention basin node to hydraulically represent the detention tank (or 'vault'/ storage) 'housing' the StormFilter cartridge system(s), with the properties given in Table 2.

Table 2 – Recommended values for MUSIC Detention Node (StormFilter Chamber) component for StormFilter NPSorb technology modelling

Parameter	Value for given cartridge name/ siphon height			Comments
	690	460	310	
Inlet properties				
Low flow by-pass (m³/s)	0			No bypass of flows below treatment flow rate occurs.
High flow by-pass (m³/s)	100			Default (very high value), noting bypass occurs in the Generic (NP Sorb) node and any overflow occurs via the overflow weir in the detention (Stormfilter chamber) node.
Storage properties				
Surface area (m²)	Varies. Adjust to be equal to value of surface area of chamber housing StormFilter cartridges minus area of cartridges.			
Extended detention depth (m)	0.77	0.54	0.39	Standard 80mm head above top of cartridge media.
Permanent pool volume (m³)	0			No permanent ponding of water occurs in appropriately functioning StormFilter technologies.
Initial volume (m³)	0			
Evaporative Loss as % of PET	0			StormFilter cartridges are almost exclusively underground. Any evaporative loss is likely to be minimal.
Outlet properties				
Equivalent pipe diameter (mm)	Varies.			Depends on cartridge height, number, and chamber dimensions. Best to liaise with Ocean Protect.
Overflow weir width (m)	Varies. Adjust to be equal to width of weir structure within system.			
Notional detention time (hrs)	Varies.			
Advanced properties				
k (m/year)	Set to 1 or zero.			Ensures no additional treatment is modelled where none exists.

Use the generic node with the properties given below in Tables 3 and 4.

Table 3 – Recommended treatment flow rate & pollutant removal for StormFilter NPSorb technology (Generic Node)

High flow bypass/ treatment flow rate (TFR)	Pollutant removal up to TFR
Treatment flow rate multiplied by type and number of cartridges*	87% for TSS 72% for TP 65% for TN 100% for gross pollutants

*: Treatment flow rates for available configurations given in Table 1.

Table 4 – Recommended generic node transfer function properties for StormFilter NPSorb technology

Pollutant	Influent	Effluent	Reduction
Total suspended solids (TSS)	1000	130	87%
Total Phosphorus (TP)	10	2.8	72%
Total Nitrogen	100	35	65%
Gross Pollutants	1000	0	100%

Conditions/Notes

The limitations of the acceptance of these claims include:

- The results lie within acceptable inflow limits for this type of catchment and based on the analysis are found to be representative. The device has been tested within the pollutant loading ranges specified by SQIDEP v1.3. As with the majority of treatment devices, where the influent water is more polluted there would likely be a greater percentage of pollutants removed and a higher residual load in effluent water – and, where the influent water is cleaner (i.e. below limits of detection), there would likely be a lower percentage of pollutants removed and a lower residual pollutant load in effluent water.
- Design and installation should be performed in accordance with the Manufacturer's guidelines. Results are reliant on the design of the device being consistent with the Manufacturer's guidelines.
- Regular inspection and maintenance should be performed in accordance with the Manufacturer's Operation and Maintenance Manuals. Results are reliant on the maintenance of the device being consistent with the Manufacturer's guidelines.

Independent Reviewers

Evaluator Signature	
Damian McCann Director AWC	
Chris Beardshaw Principal Engineer Afflux Consulting	

Issue of Verification Certificate

Acceptance by SQIDEP Governance Panel	16 September 2024
Acceptance by Stormwater Australia Board of Directors	16 September 2024
Verification Issued	9 September 2024
Stormwater Australia Verification Certificate Number Reference	SA-2024/10-VC

Verified under SQIDEP Version 1.3

Body of Evidence Pathway

