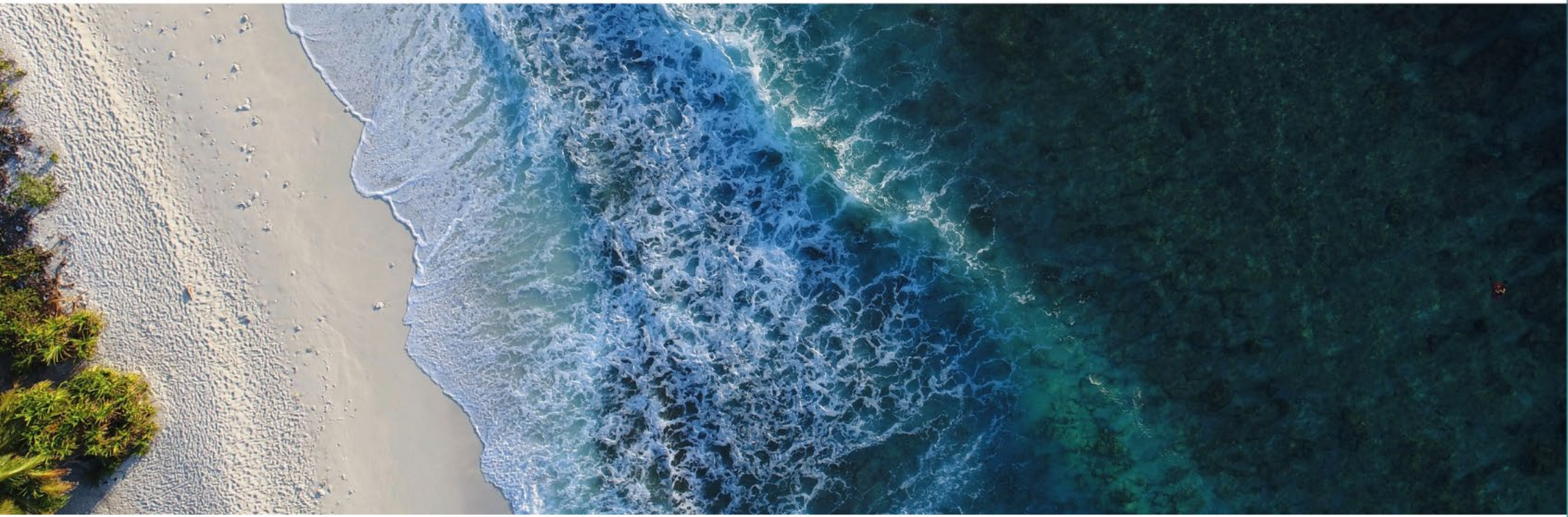
The SQIDEP approval for OceanGuard, StormFilter & Jellyfish

Presented by Brad Dalrymple & Michael Wicks

22 February 2024



Agenda

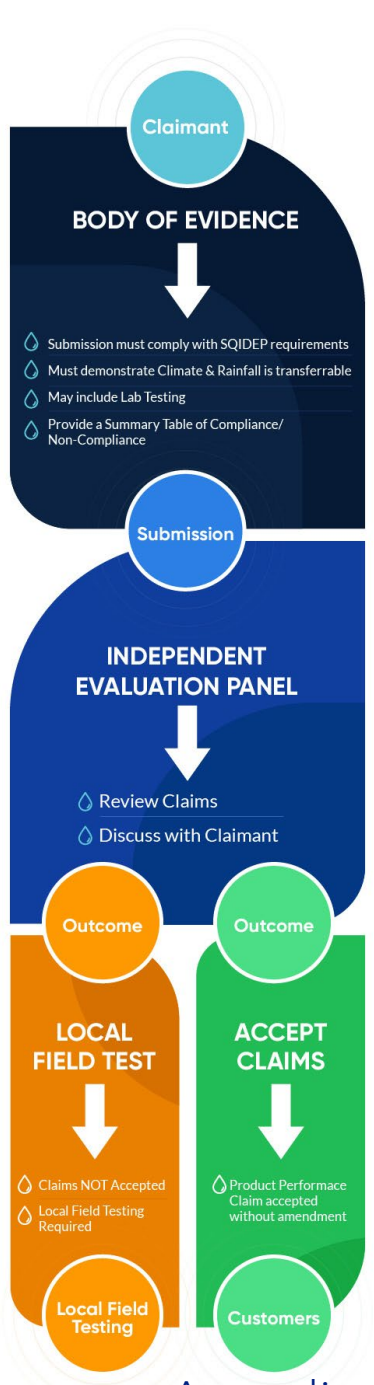
- What is SQIDEP ?
- Where is SQIDEP applied ?
- Overview of our SQIDEP-approved SQIDs
- Overview of studies submitted for review
- The SQIDEP Experience
- What now ?
- Q&A

OCEAN PROTECT


What is SQIDEP ?

What is SQIDEP ?

- SQIDEP = Stormwater Quality Improvement Device Evaluation Protocol
- "*industry-formulated, independent evaluation process for verifying the performance of devices and technologies for improving stormwater quality*", which Stormwater Australia is the custodian of
- https://www.stormwateraustralia.com.au/sqidep-stormwater-quality-improvement-device-evaluation-protocol/



Source: Stormwater Australia (2022)

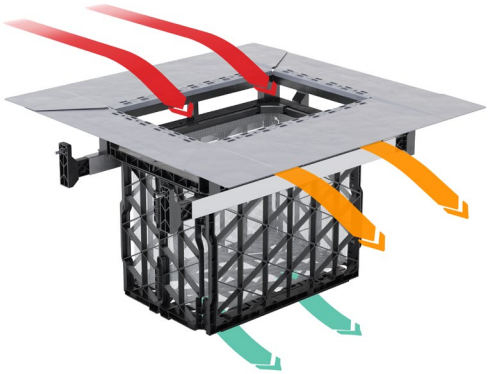

Where is SQIDEP
applied ?

Where is SQIDEP applied ?

- Queensland:
  - Gold Coast City
  - Ipswich City
  - Sunshine Coast Region
  - Brisbane City (required after 10th June)
- NSW:
  - Aerotropolis (in Western Sydney)
  - Blacktown City Council (with additional requirements) for new SQIDs
- Victoria, SA, Tasmania, WA, ACT, NT
  - ?

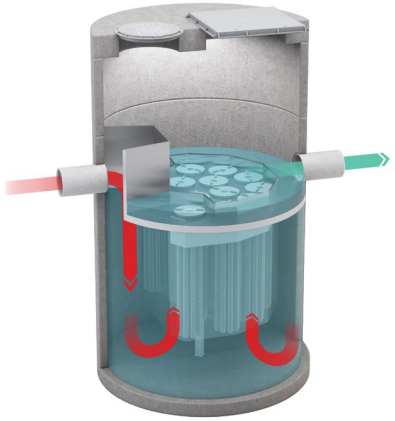
OCEAN PROTECT

Overview of our SQIDEP-approved SQIDs



OceanGuard

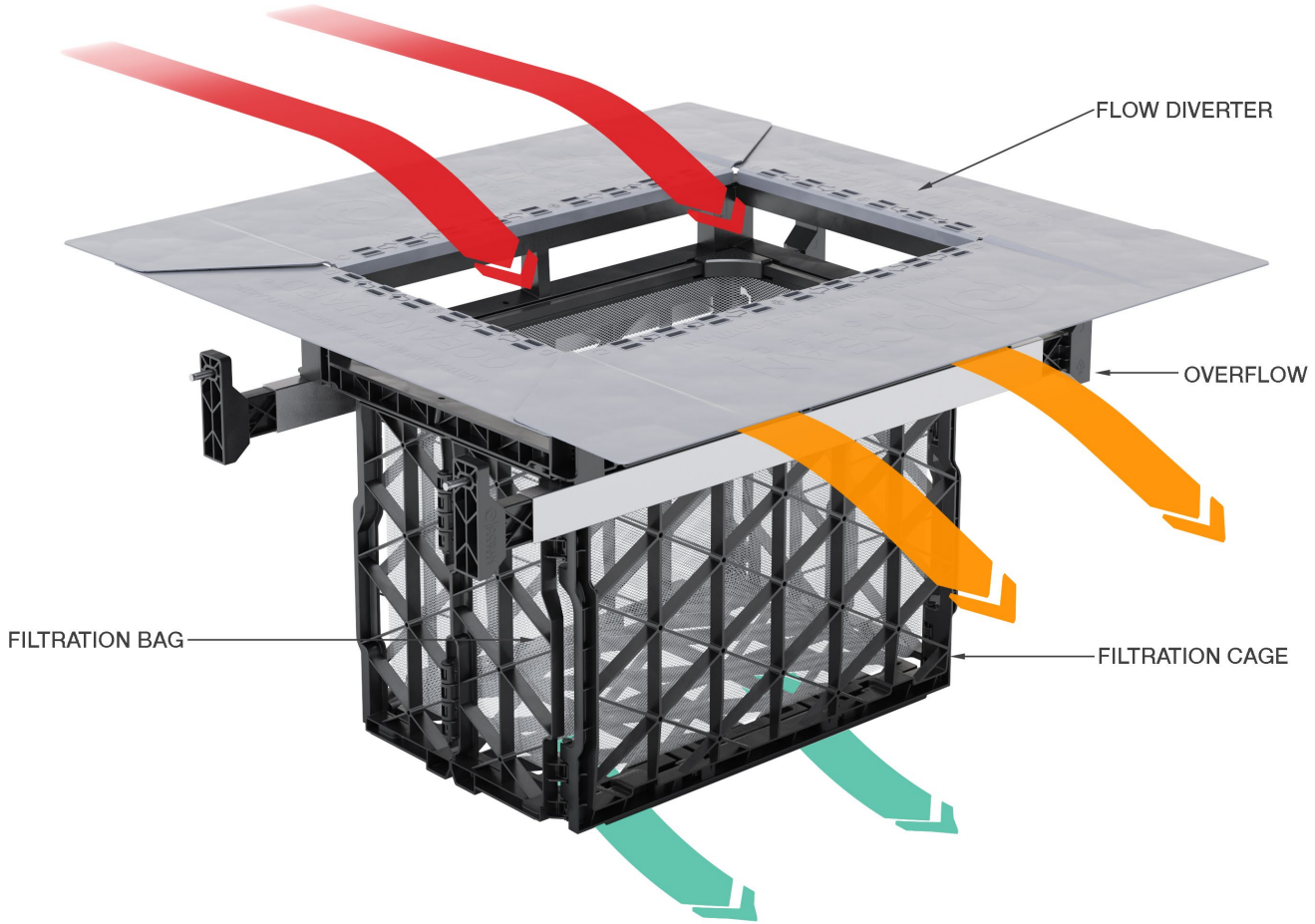
StormFilter
PSorb



Jellyfish

OCEAN PROTECT

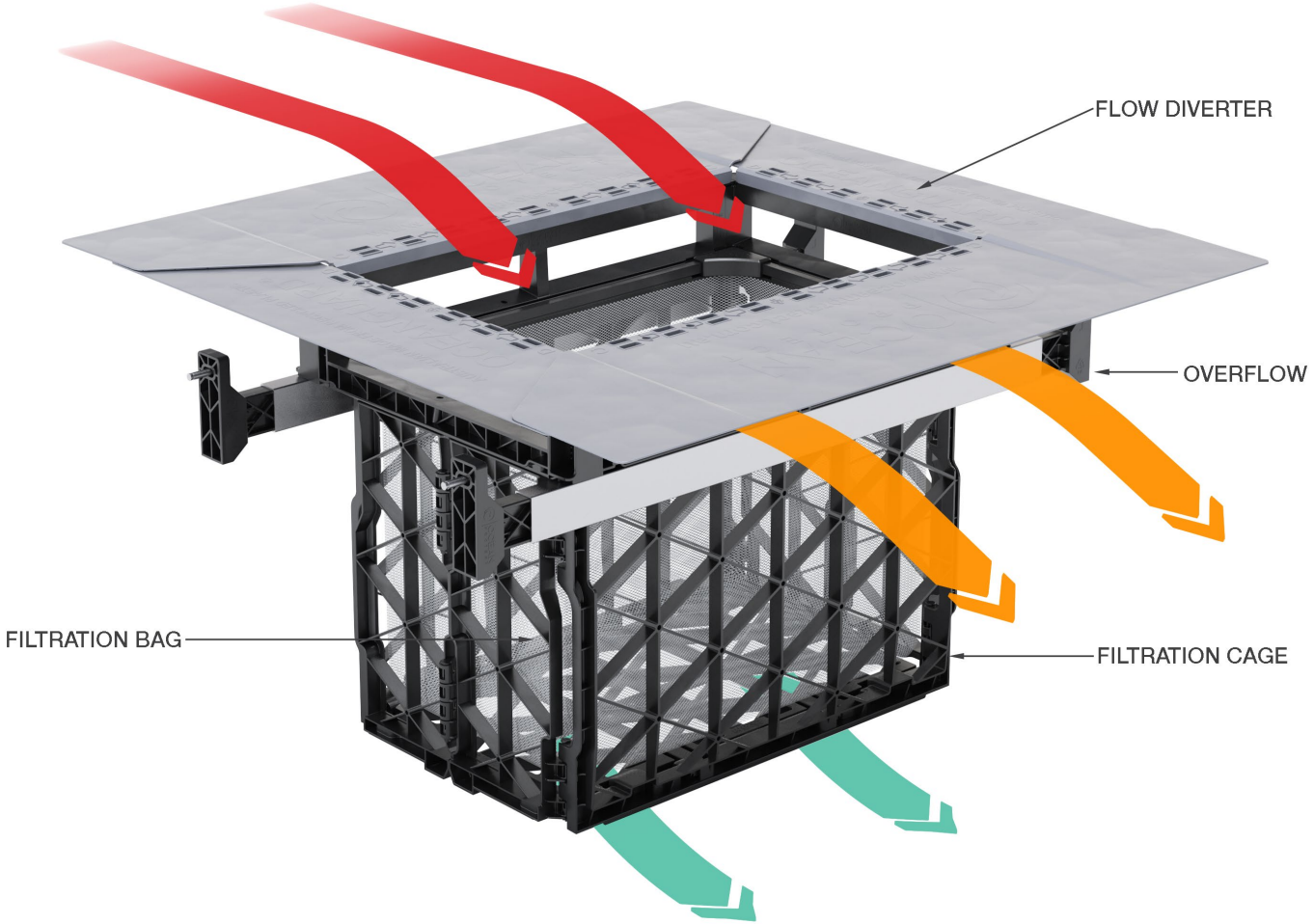
OceanGuard



OCEAN PROTECT

What is OceanGuard ?

- Gully pit basket
- Integrated into pits
- Different bag options
- Ideal for pre-treatment



OCEAN PROTECT

Application

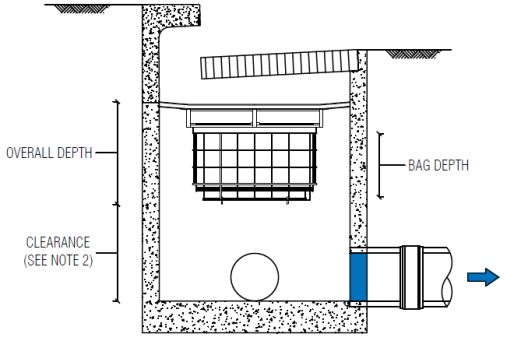
- Commercial, industrial & residential areas
- Other projects (e.g. roads, airports)



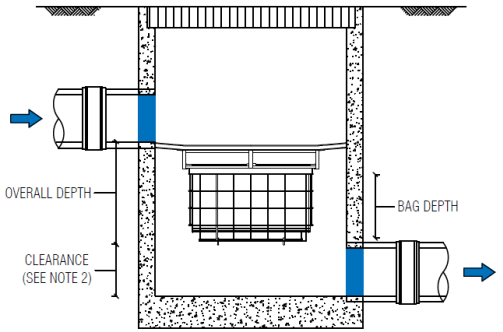

OCEAN PROTECT

Configuration

- Surface flow (typical)
- Pipe flow
- Grated strip drain
- 4 sizes
- 3 depths



SURFACE FLOW CONFIGURATION

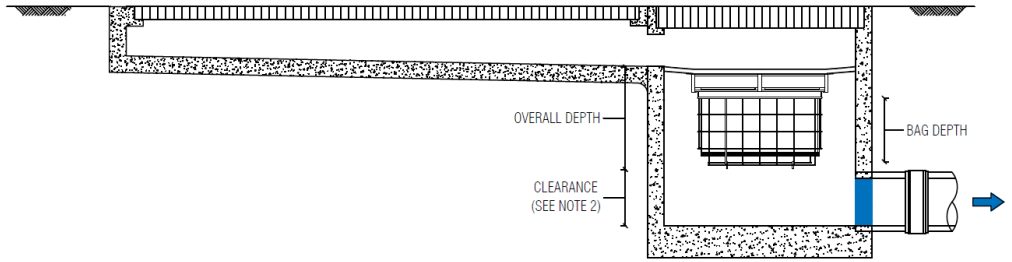


PIPE FLOW CONFIGURATION

PLAN ID	MAXIMUM PIT PLAN DIMENSIONS
S	450mm x 450mm
M	600mm x 600mm
L	900mm x 900mm
XL	1200mm x 1200mm

DEPTH ID	BAG DEPTH	OVERALL DEPTH
1	170	270
2	300	450
3	600	700

PLAN ID	DEPTH ID 1	DEPTH ID 2	DEPTH ID 3
S	▪		
M	▪	▪	
L	▪	▪	▪
XL	▪	▪	▪

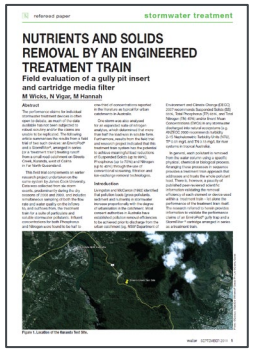


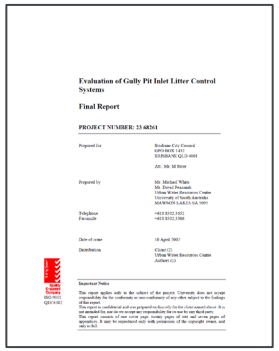
GRATED STRIP DRAIN CONFIGURATION

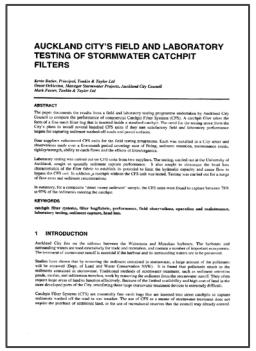
OCEAN PROTECT

Performance

- 4 x ‘real world’, published studies
- 2 x peer review reports
- SQIDEP & Council approved performance values







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Maintenance

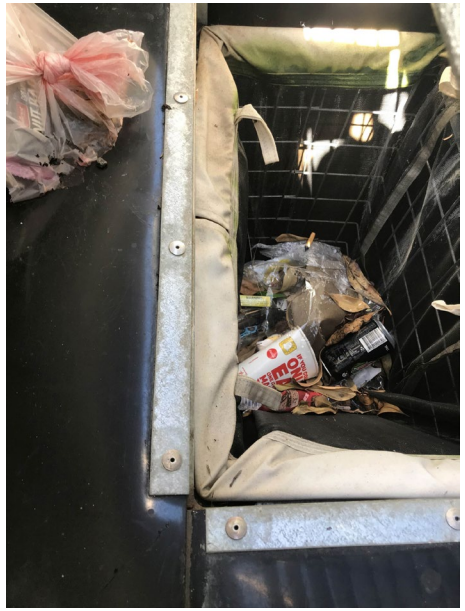
- Manual lifting of bag & emptying
- Can use vacuum unit
- Replace bag (if damaged)

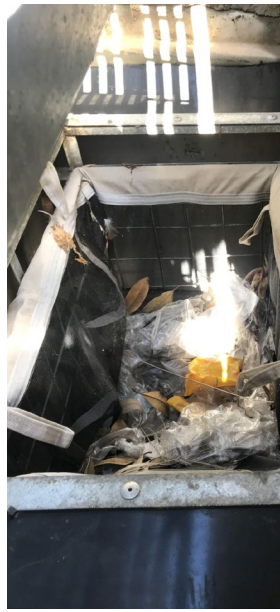
OCEAN PROTECT

Case studies

- Over 28,000 installed in Australia



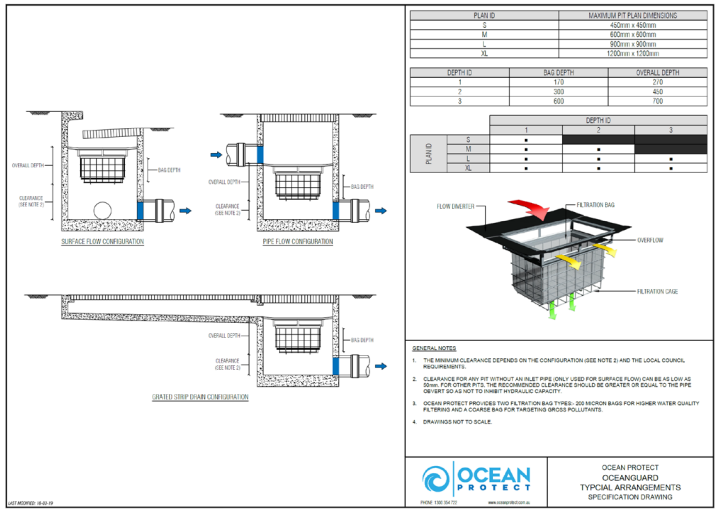


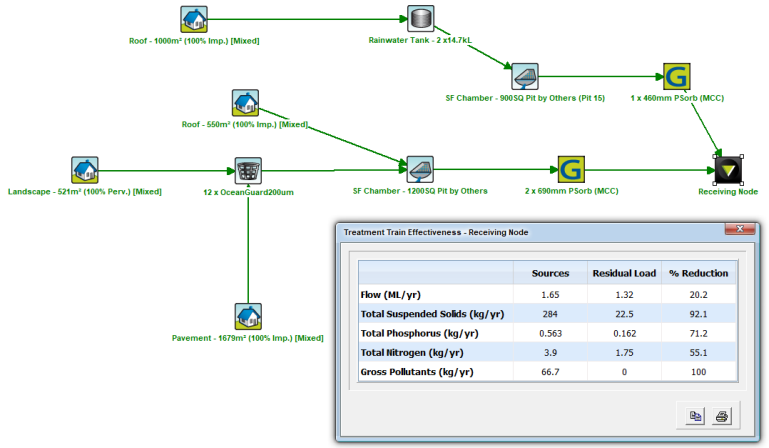



OCEAN PROTECT

How to specify ?

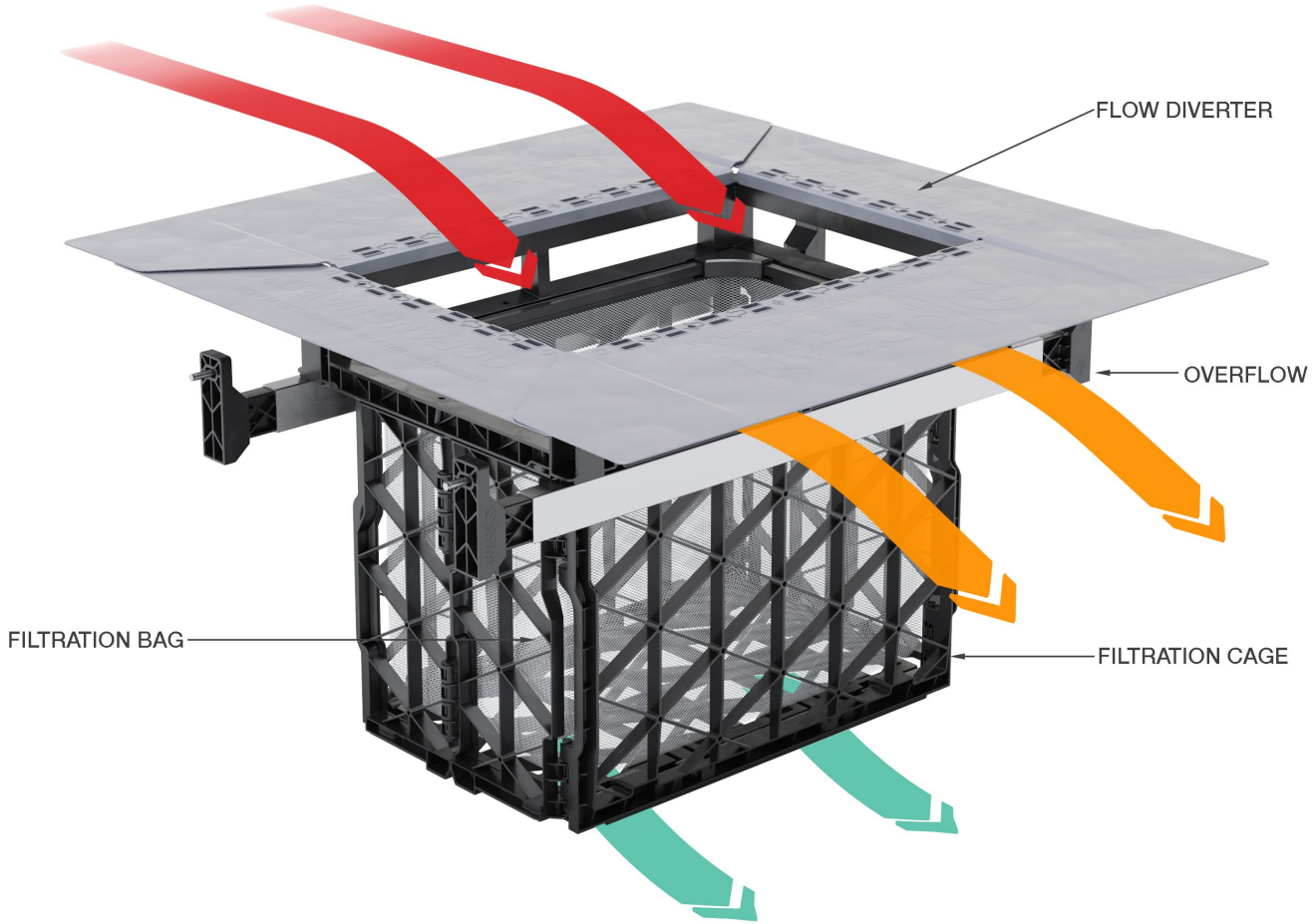
- https://oceanprotect.com.au/oceanguard/ (drawings, manuals, review paper)
- Contact Ocean Protect
- OP can do MUSIC modelling & site-specific drawings (no obligation)
- Identifying location(s) of drawings is OK





OCEAN PROTECT

OceanGuard



OCEAN PROTECT

StormFilter

OCEAN PROTECT

What is StormFilter ?

- Radial treatment technology
- Flexible configurations
- Multiple media options
- Self cleaning functionality
- Accessible & rechargeable cartridges

OCEAN PROTECT

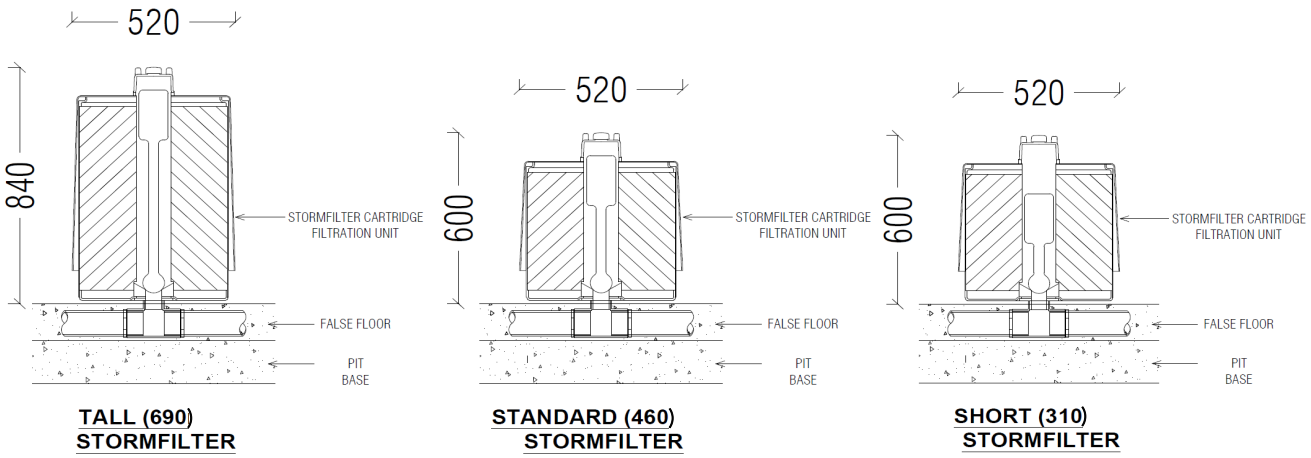
Application

- Commercial, industrial & residential areas
- Other projects (e.g. roads, airports)

OCEAN PROTECT

Configuration

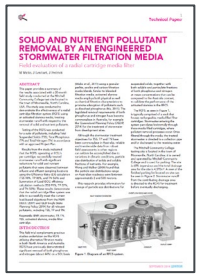
- Precast concrete pits & tanks
- Custom above ground HDPE/aluminium tanks
- Integrated within on-site detention structures
- On-line or off-line
- 3 x cartridge options

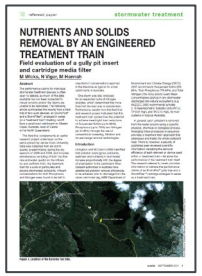


OCEAN PROTECT

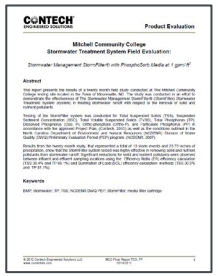
Performance

- 4 x ‘real world’, published studies
- 2 x peer review reports
- 1 x longevity study
- SQIDEP & Council approved performance values

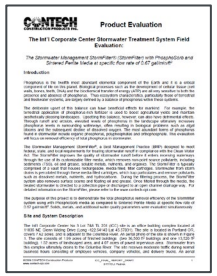

SOLID AND NUTRIENT POLLUTANT REMOVAL BY AN ENGINEERED STORMWATER FILTRATION MEDIA


NUTRIENTS AND SOLIDS REMOVAL BY AN ENGINEERED TREATMENT TRAIN

Field evaluations of a gully pit insert and cartridge media filter


CONTECH Product Evaluation

Mitchell Community College Stormwater Treatment System Field Evaluation:

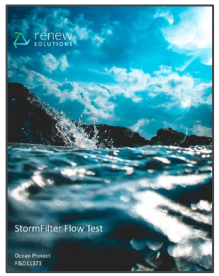

CONTECH Product Evaluation

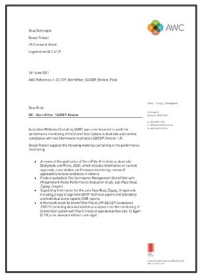
The Int'l Corporate Center Stormwater Treatment System Field Evaluation:


CONTECH

The Stormwater Management StormFilter® (StormFilter with PhosphoSorb® media at specific flow rate of 0.47 gpm/ft²)

Field Performance Summary




AWC


WESTERN SYDNEY UNIVERSITY

SCHOOL OF ENGINEERING

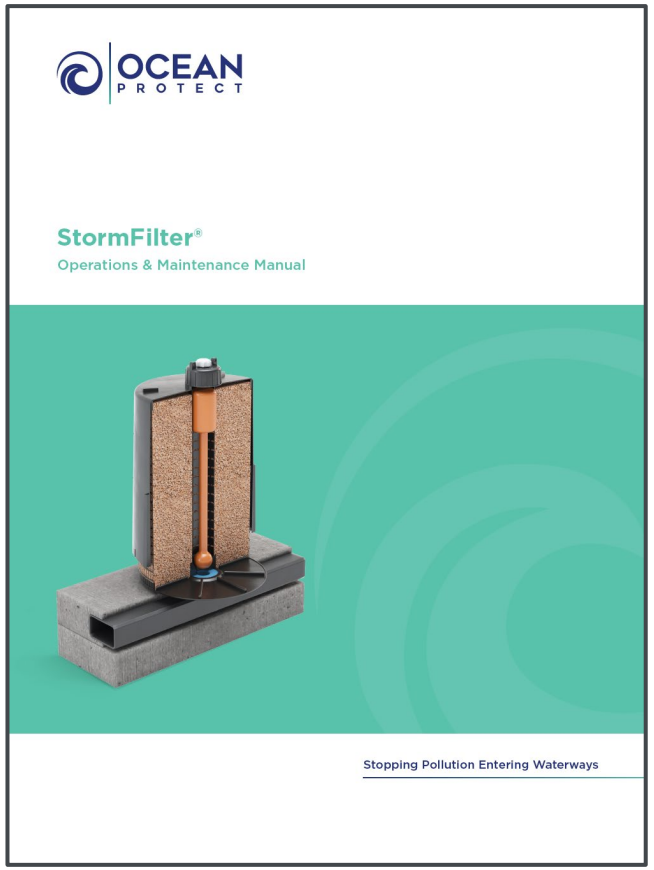
OCEAN PROTECT

A review of the application of StormFilter® in Australia

Date: August 2021

OCEAN PROTECT

Maintenance



OCEAN PROTECT

Case studies

- Over 35,000 installed in Australia
- Over 220,000 installed overseas

OCEAN PROTECT

How to specify ?

- https://oceanprotect.com.au/stormfilter/ (drawings, manuals, review paper)
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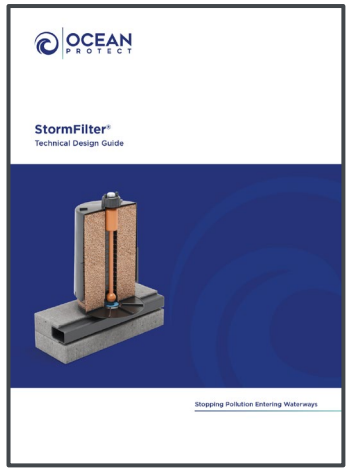
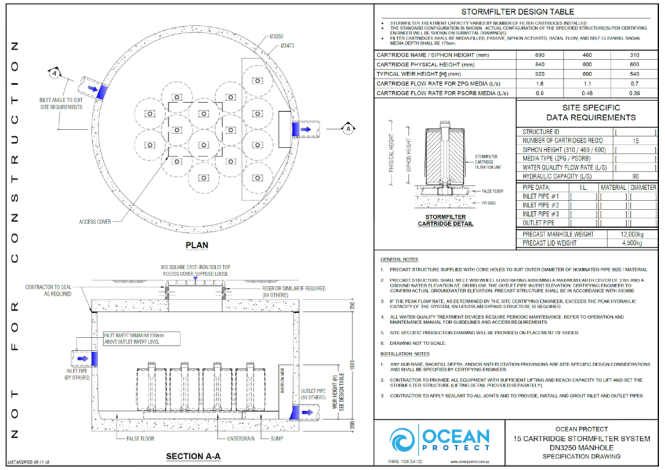
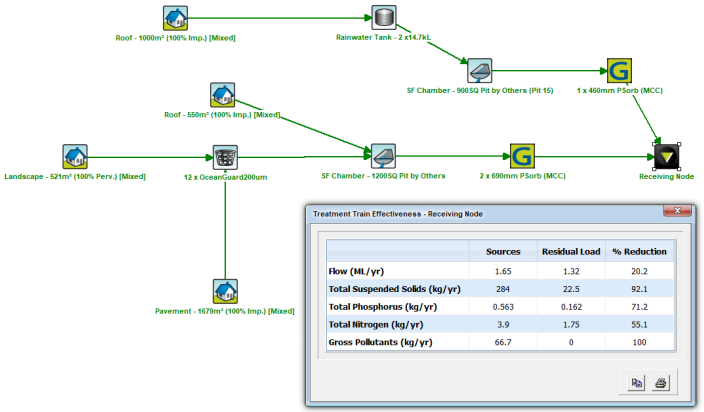
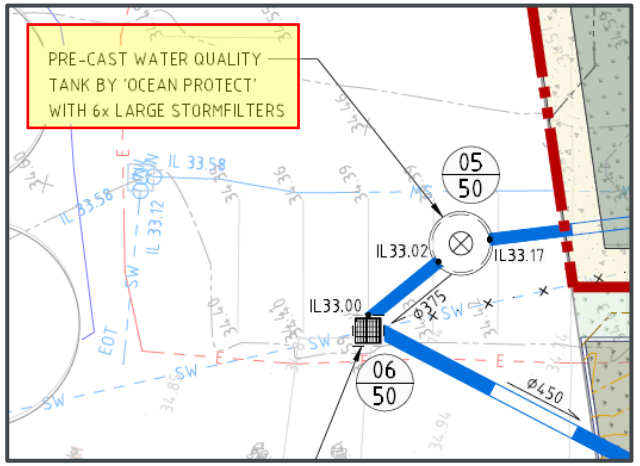
- A single note &/ or circle on drawings is OK







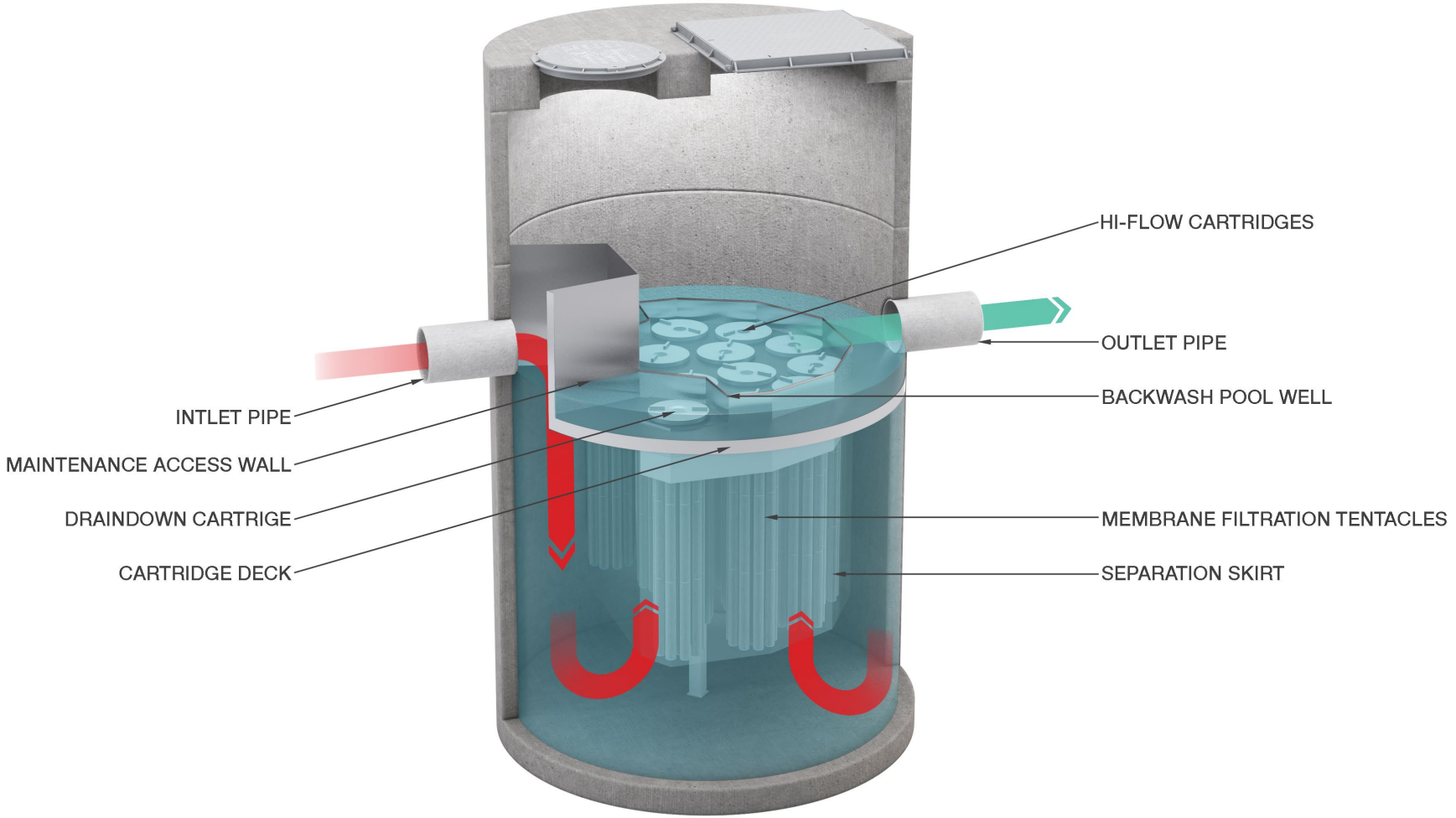


OCEAN PROTECT

StormFilter

OCEAN PROTECT

Jellyfish



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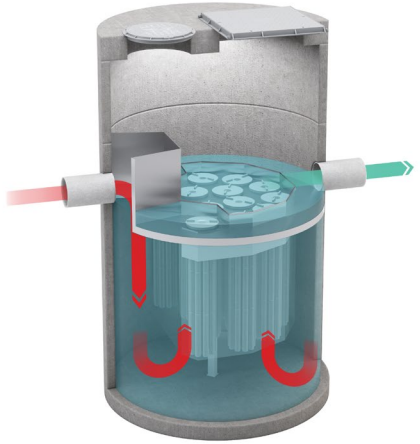
What is Jellyfish ?

- Membrane cartridge filtration
- Up-flow hydraulics
- Self cleaning functionality
- Flexible configurations
- Accessible & replaceable cartridges



OCEAN PROTECT

Application

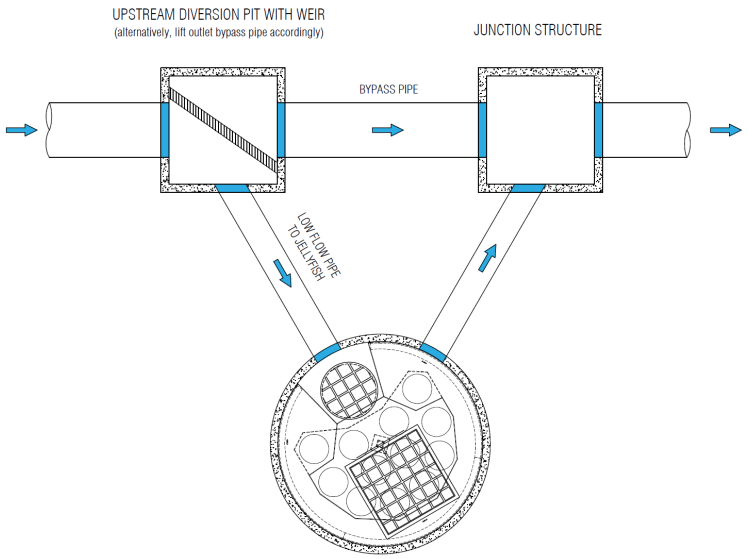
- Commercial, industrial & residential areas
- Special projects (e.g. highways, airports)
- Popular for sites with low driving head




OCEAN PROTECT

Configuration

- Precast concrete pits & tanks
- Custom chambers
- On-line or off-line



PLAN OF TYPICAL OFFLINE LAYOUT

Model	High-flow Cartridges	Drain-down Cartridges	Flow Rate (L/s)	Approximate unit Diameter (m)
JF1200-1-1	1	1	7.5	1.2
JF1200-2-1	2	1	12.5	
JF2250-3-1	3	1	17.5	2.25
JF2250-4-1	4	1	22.5	
JF2250-5-1	5	1	27.5	
JF2250-6-1	6	1	32.5	
JF2250-7-2	7	2	40	
JF2250-8-2	8	2	45	
JF2250-9-2	9	2	50	
JF2250-10-2	10	2	55	
JF3250-11-2	11	2	60	3.25
JF3250-12-2	12	2	65	
JF3250-13-3	13	3	72.5	
JF3250-14-3	14	3	77.5	
JF3250-15-3	15	3	82.5	
JF3250-16-3	16	3	87.5	
JF3250-17-3	17	3	92.5	
JF3250-18-3	18	3	97.5	
JF3250-19-4	19	4	105	
JF3250-20-4	20	4	110	
JF3250-21-4	21	4	115	
JF3250-22-4	22	4	120	
JF3250-23-4	23	4	125	
JF3250-24-4	24	4	130	
JF3250-25-5	25	5	137.5	
JF3250-26-5	26	5	142.5	
JF3250-27-5	27	5	147.5	
JF3250-28-5	28	5	152.5	

OCEAN PROTECT

Performance

- 2 x ‘real world’, published studies
- 2 x peer review reports
- SQIDEP & Council approved performance values

NJCAT TECHNOLOGY VERIFICATION

JELLYFISH® FILTER

Imbrium Systems Corporation

January 2012

HUMES AUSTRALIA

EVALUATION OF TREATMENT PERFORMANCE OF THE JELLYFISH® FILTER INSTALLATION AT IPSWICH

FINAL REPORT ON THE FIELD MONITORING PROGRAM

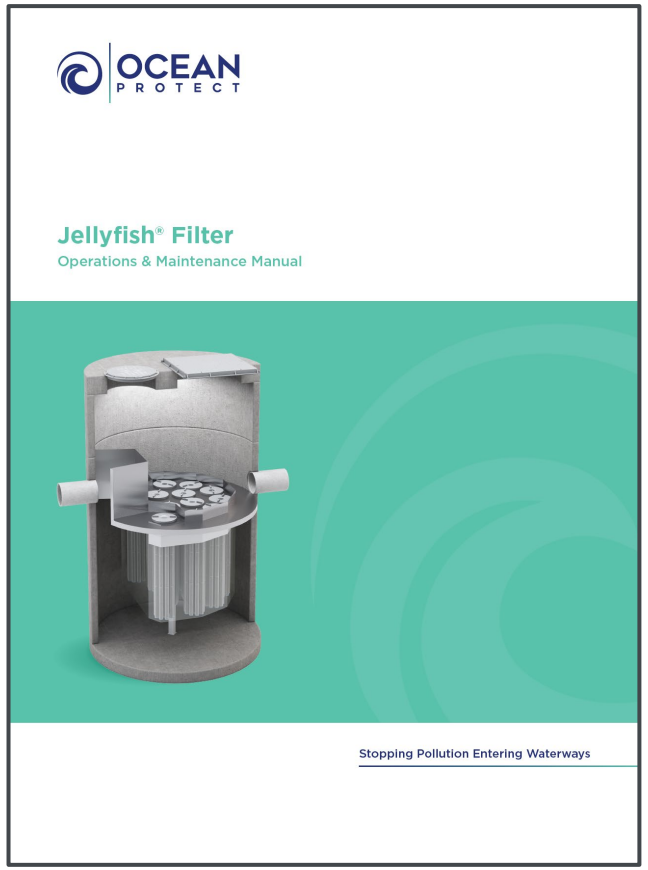
Evaluation of Treatment Performance of a Stormwater Treatment Membrane Filter under Australian Conditions

alluvium

A review of the application of Jellyfish® in Australia

Date: September 2021

Maintenance

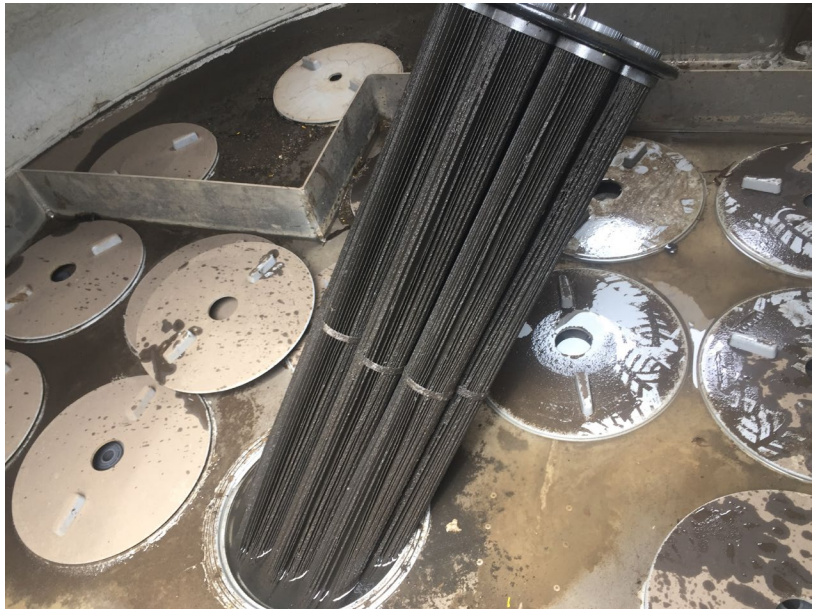


- Minor service – rinse cartridges & remove pollution (~6 months)
- Major service – replace cartridges (as required)

OCEAN PROTECT

Case studies

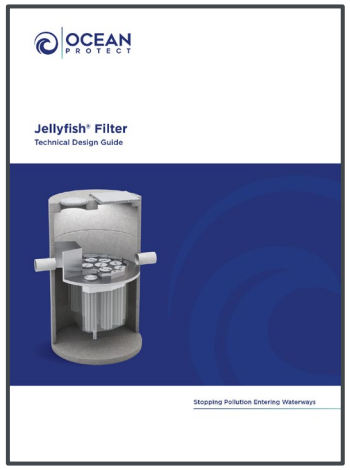
- Over 2300 installed in Australia since 2017

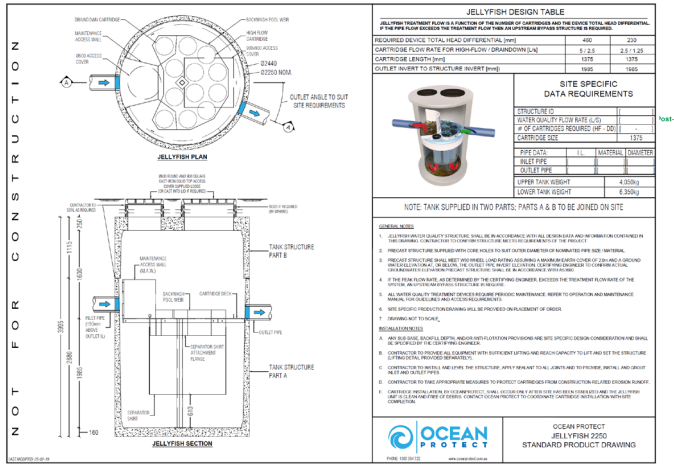


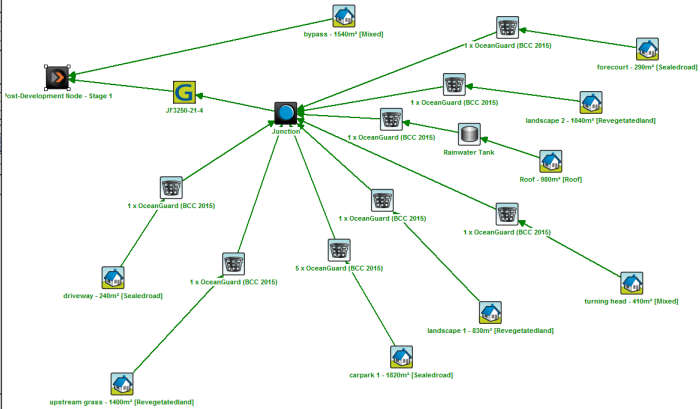
OCEAN PROTECT

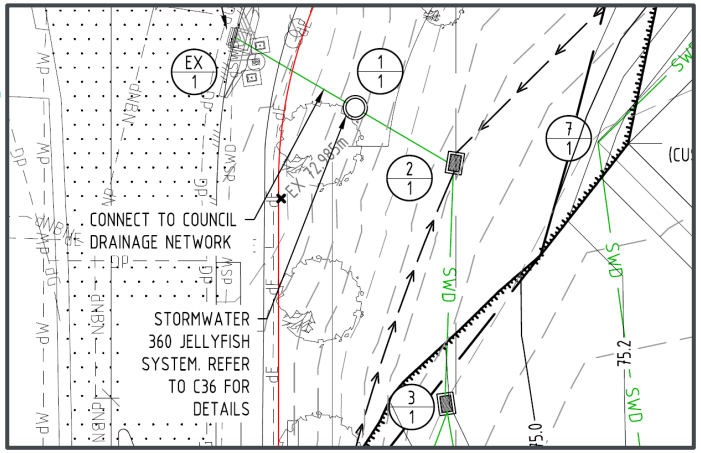
How to specify ?

- https://oceanprotect.com.au/jellyfish/ (drawings, manuals, review paper)
- Contact Ocean Protect
- OP can do MUSIC modelling & site-specific drawings (no obligation)
- A single note &/ or circle on drawings is OK



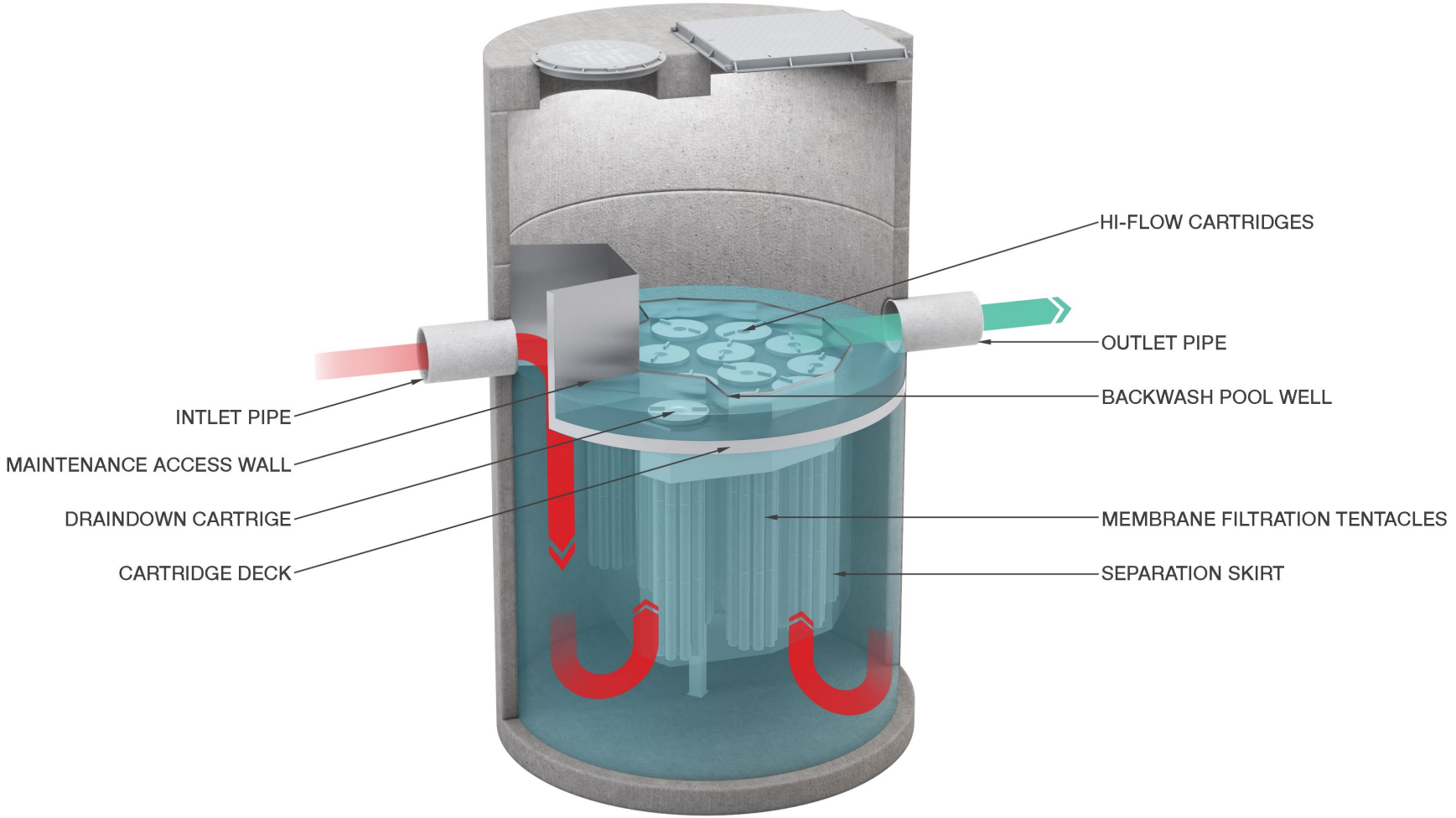






OCEAN PROTECT

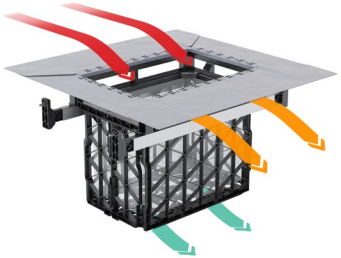
Jellyfish



OCEAN PROTECT

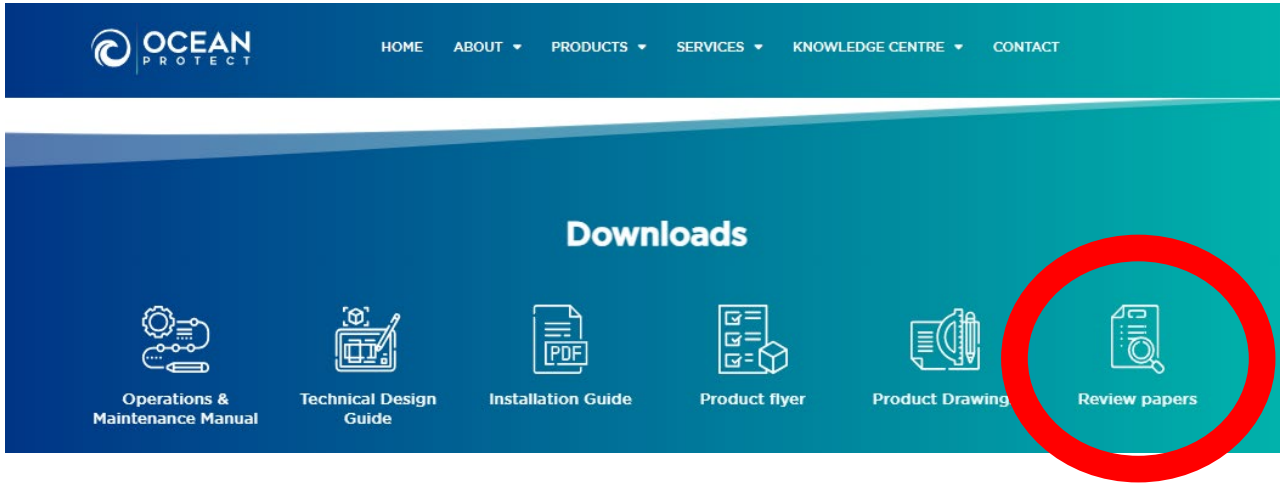
Overview of studies submitted for SQIDEP review

OceanGuard study



- Kingswood, Western Sydney, NSW
- Monitoring from March 2020 to June 2021
- Sixteen (16) events
- Single OceanGuard
  - Treatment flow rate 20L/s

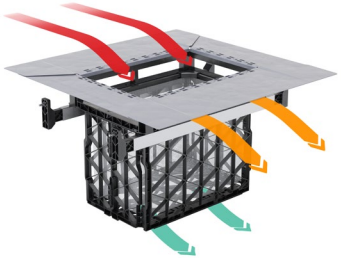
- https://oceanprotect.com.au/oceanguard/ for 'Review Paper', including:
  - Third party peer review report
  - AWA Water E-Journal paper
  - Additional studies



OCEAN PROTECT


OCEANGUARD
CATCHMENT
OCEANGUARD PIT
BUBBLER TO MEASURE TREATED FLOW RATE
SUCTION LINE
DOWNSTREAM OF
OCEANGUARD
INFLUENT SUCTION LINE
CABINET TO HOUSE SAMPLING EQUIPMENT

OceanGuard study

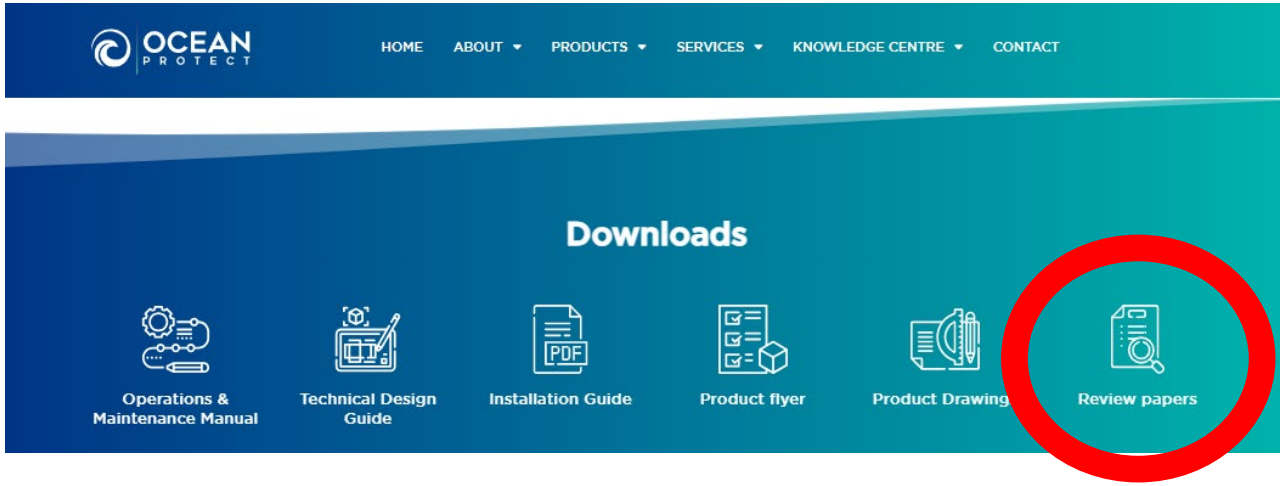


OCEAN PROTECT

StormFilter study

- Zig Zag, Oregon, USA
- Monitoring from February 2012 to April 2014
- Sixteen (16) events
- Single 460 PSorb cartridge
  - Treatment flow rate 0.86L/s

- https://oceanprotect.com.au/stormfilter/ for 'Review Paper', including:
  - Third party peer review reports
  - Additional studies



OCEAN PROTECT

StormFilter study

Figure 3. Aerial view of the Lolo Pass Site.


Figure 4. View of the drainage area of the Lolo Pass Site looking south towards US 26.

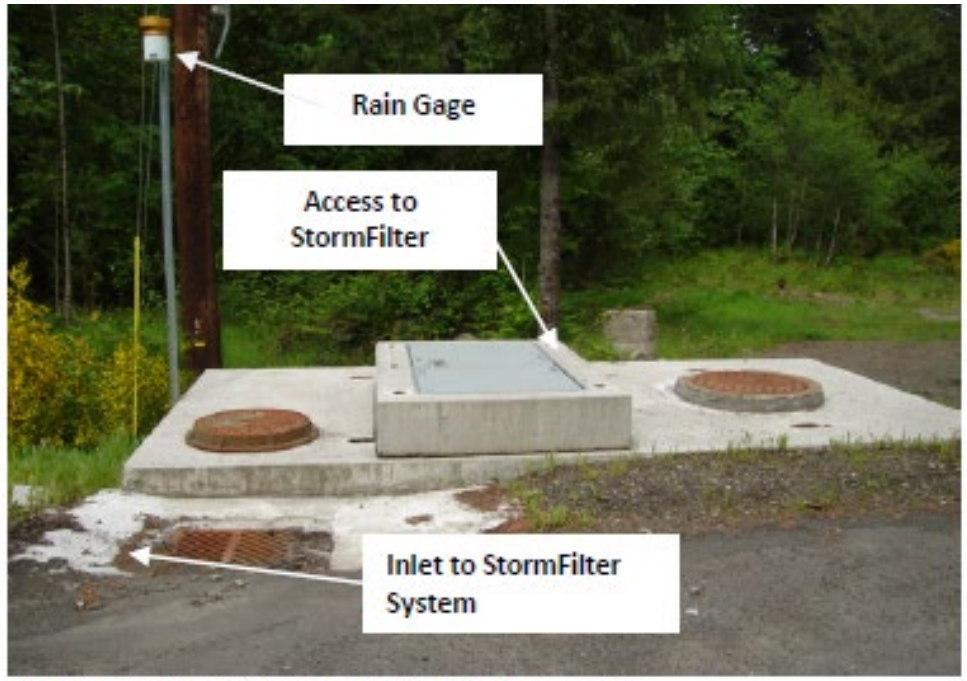
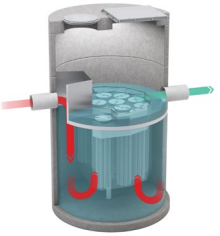


Figure 6. External view of the StormFilter system at Lolo Pass Road.

OCEAN PROTECT

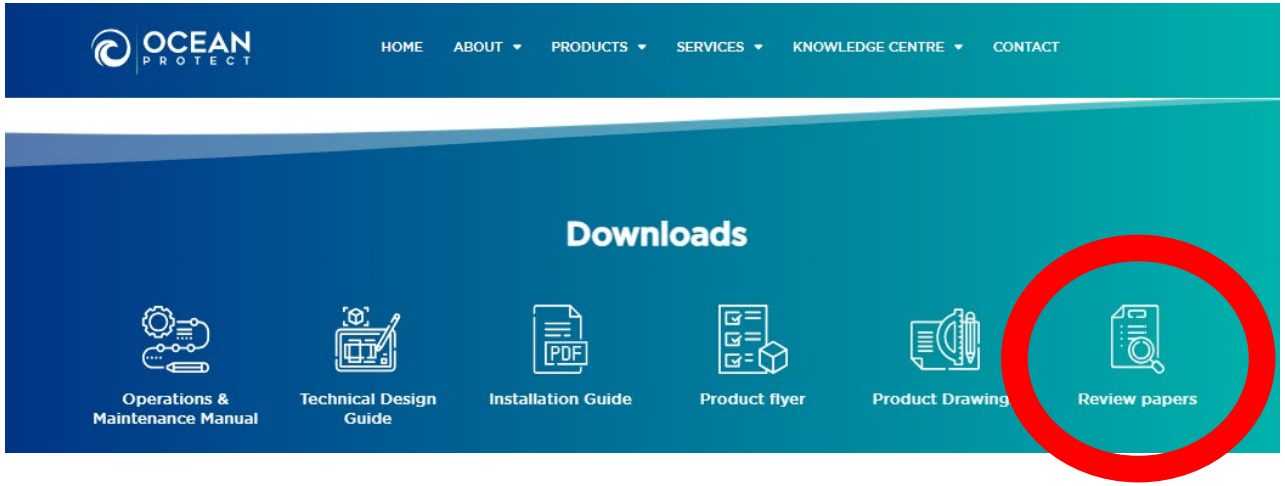
Source: Contech Engineered Solutions (no date)

Jellyfish study



- West Ipswich, QLD
- Monitoring from June 2014 to September 2015
- Seventeen (17) events
- JF1200-2-1
  - Treatment flow rate 12.5L/s

- https://oceanprotect.com.au/jellyfish-filter/ for 'Review Paper', including:
  - Third party peer review report



OCEAN PROTECT

Jellyfish study

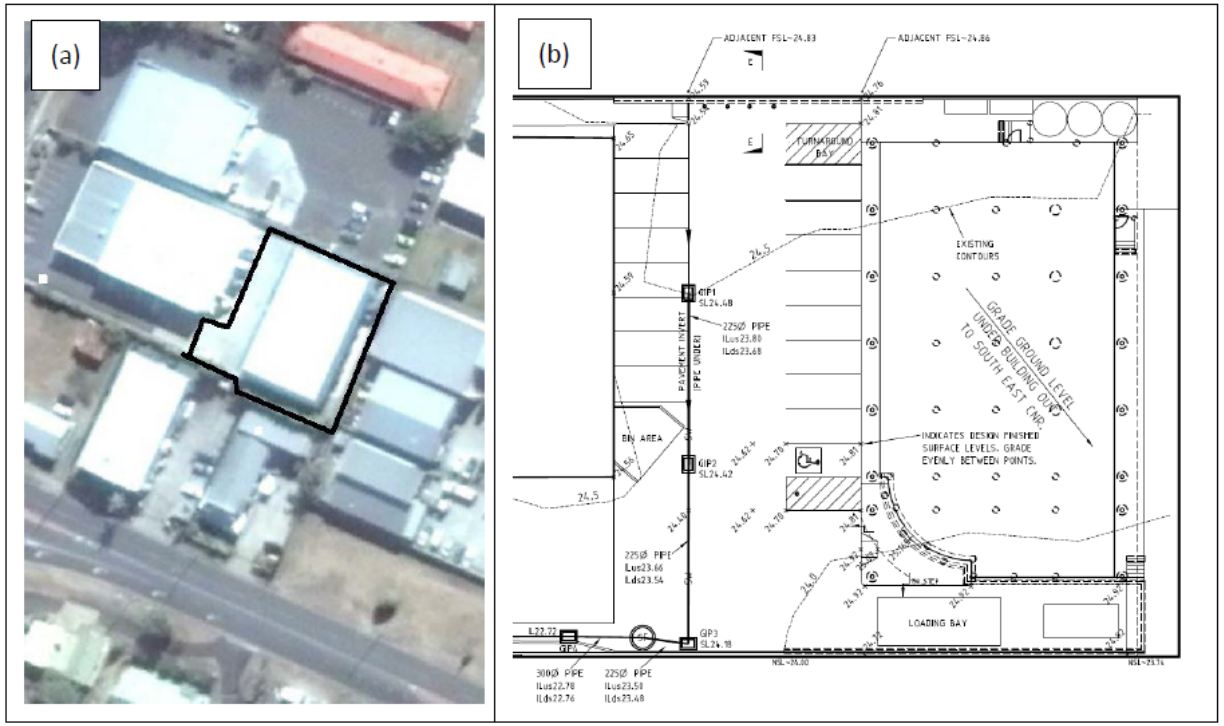
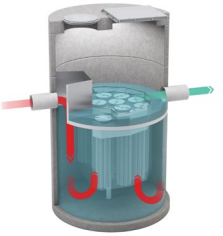


Figure 1. Study site: (a) aerial view; (b) drainage network plan



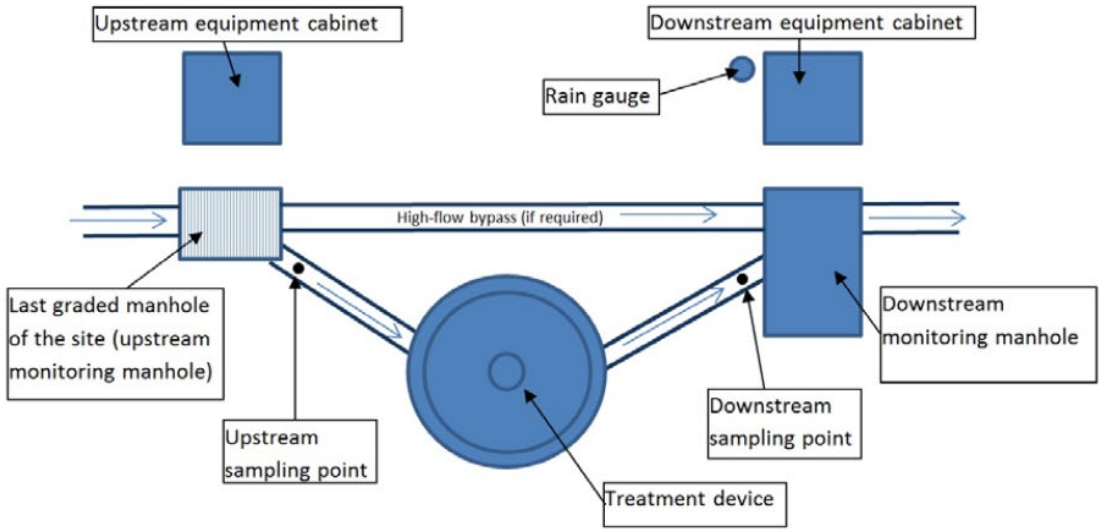


Figure 2. Monitoring system layout

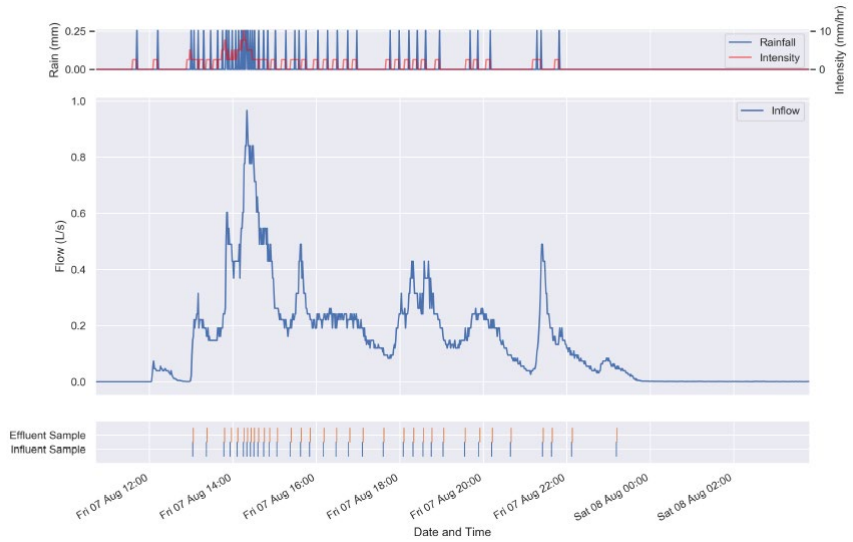
Source: Goonetilleke et al (2017)

OCEAN PROTECT

The SQIDEP Experience

SQIDEP submissions

- Initial form, & $26,500 + GST (per SQID)
- Reporting describing study methodology, results, & SQIDEP compliance
  - 70+ individual criteria
- Individual storm reports
  - Rainfall time series & analyses
  - Flow time series & analyses
  - Sampling intervals
  - Certificate of analysis
  - Chain of custody documentation
- Site photos & drawings
- Device maintenance reports
- Sampling/ monitoring equipment calibration & maintenance reports
- Statutory declarations
- Additional studies & peer review reports



OCEAN PROTECT

Timeline – OceanGuard & StormFilter reviews

- **January 2022 –** Submitted for SQIDEP review
- **October 2022 –** First meeting with reviewers
- **March 2023 –** Draft joint reports received
- **April 2023 –** Responses to the draft joint reports provided to reviewers
- **September 2023 –** Third party review initiated
- **December 2023 –** Third party review finalized & SQIDEP verification issued

OCEAN PROTECT

Timeline – Jellyfish review

- **June 2022 –** Submitted for SQIDEP review
- **May 2023 –** First meeting with reviewers
- **November 2023 –** SQIDEP verification issued

OCEAN PROTECT

OceanGuard - Summary of performance claim

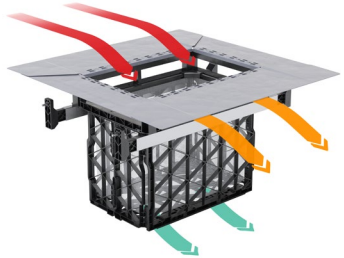


Table 2: Summary of the performance claim

Pollutant	OP Performance claim (% removal)	Verified performance claim (% removal)
Total Suspended Solids	51.6	51.6
Total Phosphorous	64.7	64.7
Total Nitrogen	40.9	24.9
Gross Pollutants	100	100*

* The gross pollutant performance claim is based on independent laboratory testing

OCEAN PROTECT

From *SQIDEP (v1.3) Independent Evaluators Joint Report – OceanGuard*

StormFilter - Summary of performance claim

Table 2: Summary of the performance claim for the OP StormFilter

Pollutant	OP Performance claim (% removal)	Verified performance claim (% removal)
Total Suspended Solids	88.6	88.6
Total Phosphorous	77.1	77.1
Total Nitrogen	61.9	61.9
Gross Pollutants*	100	100

* The gross pollutant performance claim is based on photographic evidence and evaluation of the design.

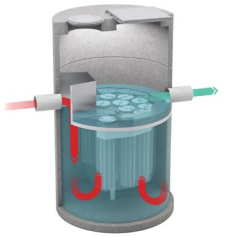
OCEAN PROTECT

From *SQIDEP (v1.3) Independent Evaluators Joint Report – StormFilter*

Jellyfish - Summary of performance claim

Table 5: Independent evaluator accepted claim for Jellyfish water quality treatment performance

Pollutant	Claimed Performance (ER) (% retained on average per annum)	Accepted Performance (ER) (% retained on average per annum)
Total suspended solids (TSS)	92.6	92.6
Total phosphorous	*57.0*	*57.0*
Total nitrogen	*46.8*	*46.8*
Gross pollutants	*100.0*	*100*



From *SQIDEP (v1.3) Independent Evaluators Joint Report – Jellyfish*

SQIDEP Certificates

- Verification certificates available at https://www.stormwateraustralia.com.au/sqidep-stormwater-quality-improvement-device-evaluation-protocol/

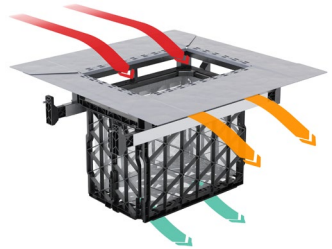
OCEAN PROTECT

OceanGuard SQIDEP Verification

STORMWATER AUSTRALIA

Stormwater Quality Improvement Device Evaluation Protocol (SQIDEP)

VERIFICATION CERTIFICATE



Verified method to model in MUSIC

Modelling a OceanGuard in MUSIC is as follows:

Use a Generic node with the following properties:

High flow bypass/ treatment flow rate (TFR)	Pollutant removal up to TFR
20 L/ s per OceanGuard	51.6% for TSS 64.7% for TP 24.9% for TN 100% for gross pollutants

Input properties should reflect those given below:

Pollutant	Influent	Effluent	Reduction
Total suspended solids (TSS)	1000	484	51.6%
Total Phosphorus (TP)	10	3.53	64.7%
Total Nitrogen	100	75.1	24.9%
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.
- The OP OceanGuard filter bag is the only treatment mechanism applied by the device. The field results evaluated for the OP OceanGuard were for a device with a 200-micron filter bag. The OP OceanGuard filter bag can be supplied with multiple pore sizes from 200 micron or larger. This verification certificate is specific to filter bag with pore size of 200 microns.
- Design and installation should be performed in accordance with the manufacturer's guidelines. Results are reliant on the maintenance 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.

Available at: https://www.stormwateraustralia.com.au/sqidep-stormwater-quality-improvement-device-evaluation-protocol/

StormFilter PSorb SQIDEP Verification

STORMWATER AUSTRALIA

Stormwater Quality Improvement Device Evaluation Protocol (SQIDEP)

VERIFICATION CERTIFICATE

Verified method to model in MUSIC

Modelling a StormFilter PSorb technology in MUSIC is as follows:

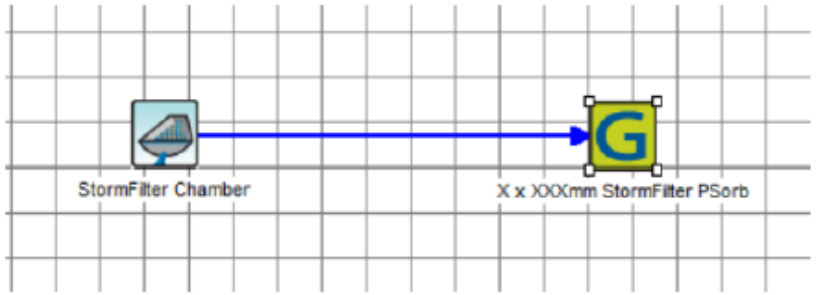


Table 1 – Summary of StormFilter® PSorb cartridge dimensions

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)*	1.26	0.86	0.60

*: Treatment flow rate based on StormFilter® Psorb 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 component for StormFilter® PSorb technology modelling

Parameter	Value for given cartridge name/ siphon height			Comments
	690	460	310	
Inlet properties				
Low flow by-pass (m^3/s)	0			No bypass of flows below treatment flow rate occurs.
High flow by-pass (m^3/s)	100			Default (very high value), noting bypass occurs in the Generic node and any overflow occurs via the overflow weir in the detention node.
Storage properties				
Surface area (m^2)	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 (m^3)	0			No permanent ponding of water occurs in appropriately functioning StormFilter® technologies.
Initial volume (m^3)	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.

Available at: https://www.stormwateraustralia.com.au/sqidep-stormwater-quality-improvement-device-evaluation-protocol/

StormFilter PSorb SQIDEP Verification (cont'd)

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

Table 3 – Recommended treatment flow rate & pollutant removal for StormFilter® PSorb technology

High flow bypass/ treatment flow rate (TFR)	Pollutant removal up to TFR
Treatment flow rate multiplied by number of cartridges*	88.6% for TSS 77.1% for TP 61.9% 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® PSorb technology

Pollutant	Influent	Effluent	Reduction
Total suspended solids (TSS)	1000	114	88.6%
Total Phosphorus (TP)	10	2.29	77.1%
Total Nitrogen	100	38.1	61.9%
Gross Pollutants	1000	0	100%

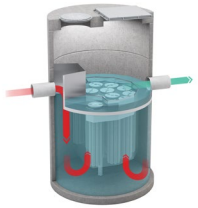
Conditions/Notes	The limitations of the acceptance of these claims include: • The results lie within acceptable inflow limits for this type of catchment and based on the analysis are found to be representative. The device has been tested within the pollutant loading ranges specified by SQIDEP v1.3. As 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 maintenance 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.

Available at: https://www.stormwateraustralia.com.au/sqidep-stormwater-quality-improvement-device-evaluation-protocol/

Jellyfish SQIDEP Verification

STORMWATER AUSTRALIA

Stormwater Quality Improvement Device Evaluation Protocol (SQIDEP)



VERIFICATION CERTIFICATE

Verified method to model in MUSIC

Modelling a Jellyfish Filter in MUSIC is as follows:

Bypass (TFR) parameters should be set as appropriate, according to the following:

Driving head (mm)	Peak flux* (L/s/m²) per cartridge		Cartridge length	TFR (L/s) per cartridge		Pollutant removal
	Hi-flow	Drain down		Hi-flow	Drain down	
457	0.141	0.071	54-in (1.37m)	5	2.5	TSS 92.6% TP 57.0% TN 46.8% GP 100%
			27-in (0.686m)	2.5	1.30	
305	0.094	0.055	54-in (1.37m)	3.34	1.96	
			27-in (0.686m)	1.68	0.98	
229	0.071	0.045	54-in (1.37m)	2.52	1.58	
			27-in (0.686m)	1.27	0.79	

*: Peak flux rate is defined as the maximum filtration flux rate or maximum flow per unit of membrane surface area. The above peak flux rates are derived from the University of Florida (2011) report *TARP Field Test Performance Monitoring of a Jellyfish Filter JF4-2-1*. This report confirmed a peak flux rate of 0.141 L/s/m² for the hi-flow cartridge and 0.071 L/s/m² for the drain-down cartridge for a 457mm driving head (35.4m² membrane surface area per cartridge).

Input properties should reflect those given below:

Pollutant	Influent	Effluent	Reduction
Total Suspended Solids (TSS)	1000	74	92.6 %
Total Phosphorus (TP)	10	4.3	57.0 %
Total Nitrogen (TN)	100	53.2	46.8 %
Gross Pollutants (GP)	1000	0	100 %

Conditions/Notes

The limitations of the acceptance of these claims include:

- As with the majority of treatment devices, designers should consider the need for pre-treatment on a case-by-case basis with regard to optimising the maintenance regime for the site.
- 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 maintenance 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.

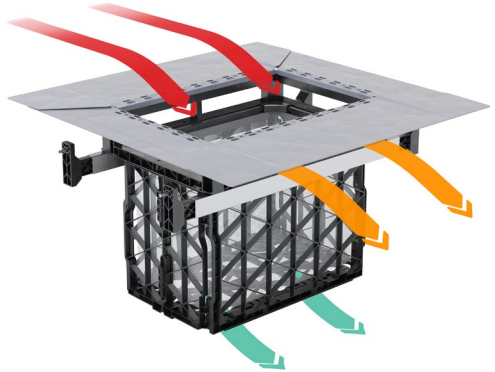
Notes

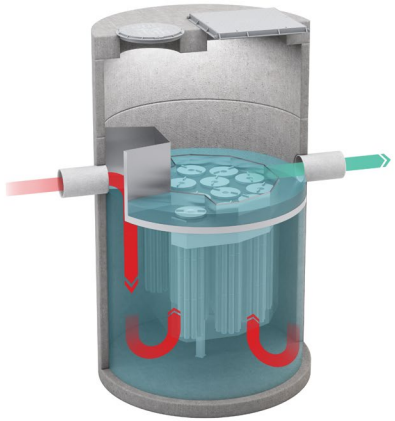
There is no pathway for a gross pollutant to move through one of the tentacles. The only other potential pathway for a gross pollutant to leave the system would be by flowing over the weir. To ensure this does not occur, the following is required:

1) The weir (maintenance access wall) shall be set a minimum of 100 mm above the system design hydraulic grade line.
2) If this is not achievable, then the weir level shall be set so that it is a maximum of 50 mm below the soffit of the chamber.
3) At all times, the weir (The maintenance access wall) will be above the system design HGL regardless of requirements 1 and 2.

Available at: https://www.stormwateraustralia.com.au/sqidep-stormwater-quality-improvement-device-evaluation-protocol/

Summary

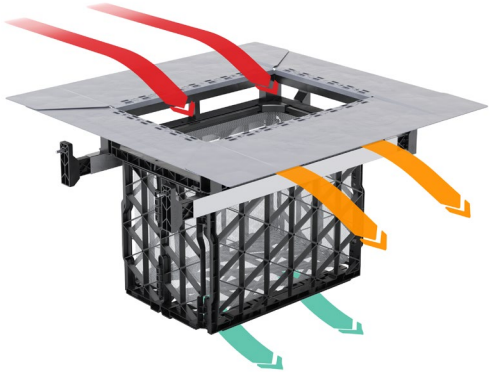


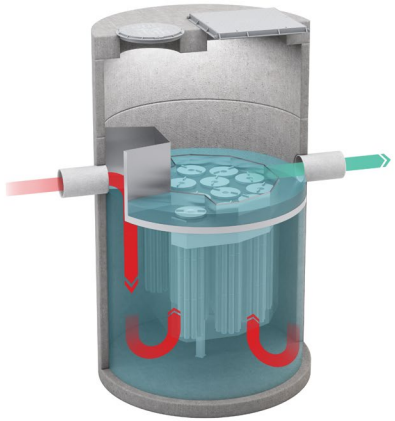


- SQIDEP verified TSS/TP/TN/ GP reductions as per submitted* claims
  - *Except for OceanGuard TN removal
  - Applicable to all available configurations
- SQIDEP verified treatment flow rates (TFR) as per submitted claims
  - *Note*: TFR of the SQIDEP-approved StormFilter PSorb is different to our 'standard'
- Design, installation & maintenance as per typical OP recommendations

OCEAN PROTECT

Key advantages of Ocean Protect

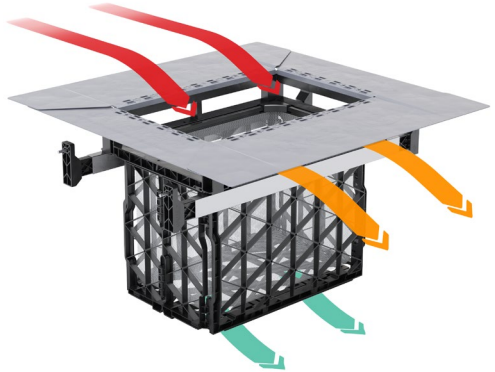


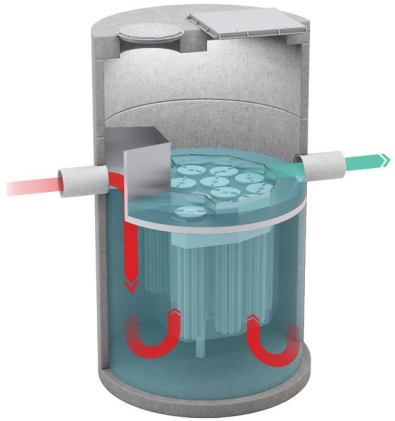


- The only SQIDEP-approved gully pit insert
- The highest SQIDEP-approved nutrient removal for any cartridge
- Likely the most efficient “treatment train”

OCEAN PROTECT

Modelling Options





- Ask OP to do your MUSIC modelling (no obligation); or
- Ask OP to provide you MUSIC nodes (& spreadsheet calculators); or
- Develop your own MUSIC nodes (based on SQIDEP verification statements)
  - Feel free to ask OP to check models/ designs

OCEAN PROTECT


What now ?

What now ?

- OceanGuard, StormFilter PSorb & Jellyfish can now be specified where SQIDEP verification required
- Filterra biofiltration & another SQID already submitted for SQIDEP review
- Continued R&D by Ocean Protect

OCEAN PROTECT

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THANK YOU

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