TORNADO GPT

HIGH FLOW CONTINUOUS DEFLECTION SEPARATION GPT

PROTECTOR

SAVING NATURE.

At Protector we are focused on improving the quality of our waterways by supplying products that are designed to capture and contain pollution in stormwater runoff for many applications. Contaminants such as hydrocarbons, suspended solids, plastic rubbish and dissolved nutrients are removed by utilising absorption, retention, filtration and capture processes. These stormwater systems will deliver cleaner water back into the environment, saving nature for future generations.

Protector is an Australian family owned and operated stormwater treatment and fiberglassing company. Protector's 18 years of fabrication experience is a result of continuous improvement in product design and manufacturing innovation.

Our products are renowned for their quality and are engineered to Australian standards BS4994-1987 and ASME RPT1. Protector has improved the ease of device installation by eliminating the need for confined space entry and the requirement to access the base of site excavations.

Quality control procedures ensure each product is manufactured to specification and post production, each unit is inspected and factory tested to industry standards.

Protector products are constructed using the advanced chop hoop filament winding process which ensures circumferential as well as longitudinal strength. Every Protector product has a smooth molded resin rich inner corrosion barrier layer and an external resin barrier. Being manufactured in FRP (Fibre Reinforced Plastic) Protector products are light, easy to handle and easy to install.

FRP composites are a sustainable material that is reflected through its physical characteristics resulting in longer service life that exceeds traditional materials. The weight saving advantages lower construction and transport costs, reducing environmental impact. FRP products are high strength and are far more resistant to the effects of ageing, weathering, and degradation in severe environments. Maintenance is improved by the smooth internal molded finish providing excellent protection against scum accumulation. Fibre Reinforced Plastic is not susceptible to rust and offers excellent corrosion resistance.

TORNADO GPT

HIGH VOLUME VORTEX GPT FILTRATION SYSTEM

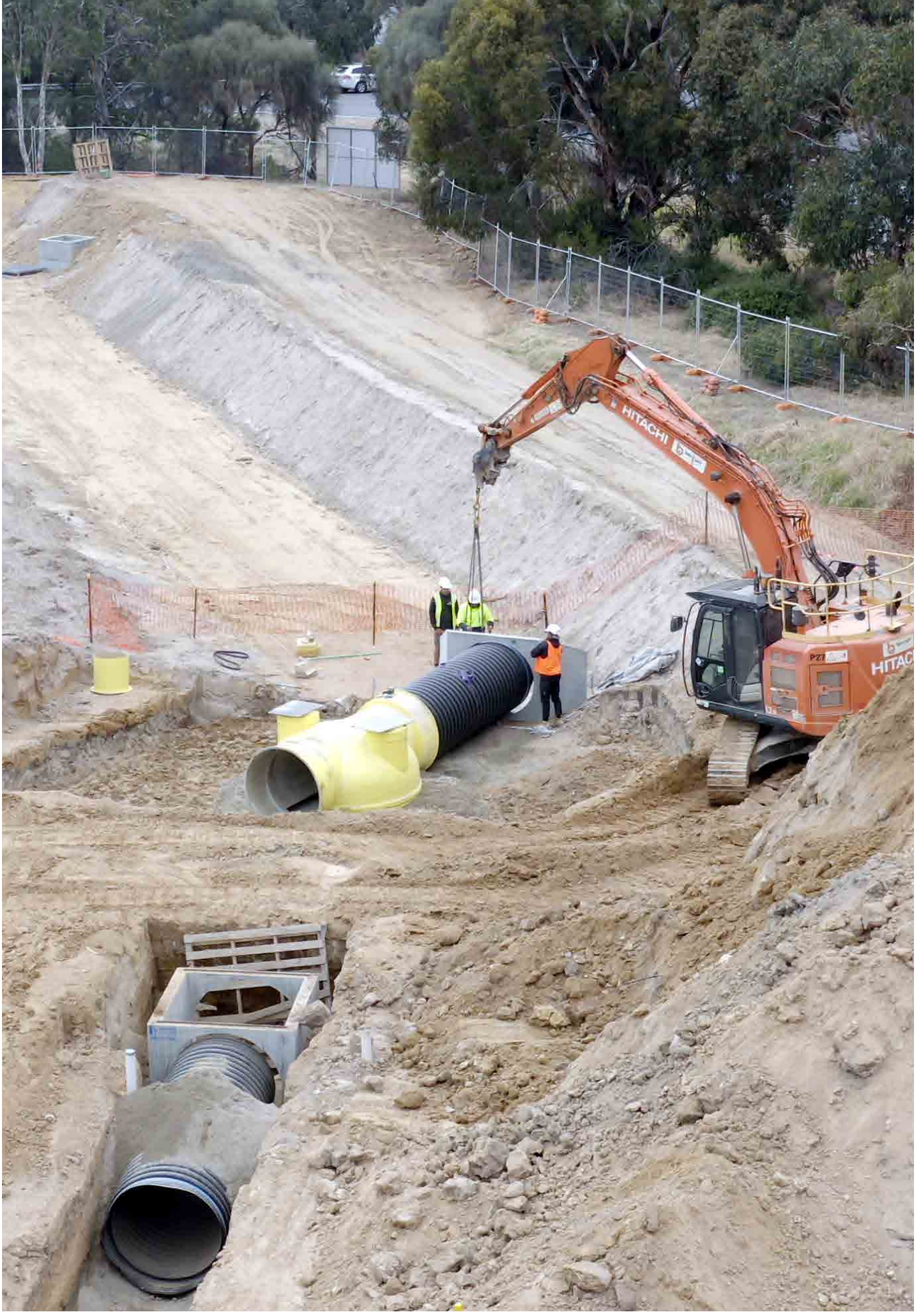
- VORTEX SEPARATION AND INDIRECT SCREENING
- INNOVATIVE DESIGN HANDLES HIGHER FLOWS
- INTERNAL WEIR DIVERTS EXCESS WATER

Tornado GPT is an advanced gross pollutant trap that utilizes a combination of vortex separation and indirect screening to remove particles larger than 1mm from stormwater runoff. Its unique design enables it to handle higher flows, prevent screen blinding, and retain a wide range of pollutants, including floatables, settleable solids, and neutrally buoyant substances. Additionally, the internal hydrocarbon baffle captures free hydrocarbons and oils and prevents their release into the environment. If flows exceed the treatable rate, an internal weir diverts excess water to the outlet, while treated and bypass flows exit via the outlet pipe. With its high-performance capabilities, Tornado GPT is an efficient and effective solution for managing urban stormwater quality and reducing the impact of urban runoff on natural ecosystems.

When choosing between an offline or inline system, similar considerations apply. An offline Tornado GPT is typically used for larger drainage areas with higher flow rates, while an inline system is suitable for smaller drainage areas. The decision depends on the specific site requirements and the desired treatment level.

The Tornado GPT utilises Continuous Deflection Separation technology is a type of stormwater treatment device that is designed to capture and treat pollutants from stormwater runoff. The benefits of using a Tornado GPT stormwater device include:

- Efficient pollutant removal: The Tornado GPT is designed to efficiently remove pollutants from stormwater runoff, including sediment, trash, debris, and hydrocarbons.
- High flow rate capacity: The Tornado GPT have a high flow rate capacity, which means they can treat large volumes of stormwater runoff quickly and effectively.
- Low maintenance requirements: The Tornado GPT have low maintenance requirements, which means they require minimal attention once installed. This makes them a cost-effective option for stormwater treatment.
- Space-saving design: The Tornado GPT have a compact design, which means they can be installed in areas with limited space. This makes them ideal for urban areas where space is at a premium.



TORNADO GPT

INLINE LAYOUT

TREATMENT EFFICIENCIES

POLLUTANT	EFFICIENCY
Gross Pollutants (GP)	99.99%
Total Suspended Solids (TSS)	70%
Total Phosphorus (TP)	30%
Total Nitrogen (TN)	0%
Hydrocarbon	90%

Ask Protector to check site MUSIC model for precise efficiencies.

FOR MEDIUM CATCHMENT AREAS TO LARGER VOLUMES

TornadoGPT with its exceptional efficiency in removing Total Suspended Solids (TSS), the CDS highlights its effectiveness in capturing gross pollutants, some nutrients, oil and grease, and sediments. TornadoGPT will be a perfect fit for car parks and shopping centres, pre-treatment for reuse, wetland applications and industrial and residential developments, pipes, roads, channels, and creeks. This advanced design is commonly used in medium-risk commercial and industrial applications, providing an optimal separation of TSS, light liquids, and pollutants. Protector's TornadoGPT treatment devices accommodate various flow rates and are compatible with different pipe sizes and types.

INLINE TORNADO GPT SPECIFICATIONS

MODEL	TREATMENT FLOW RATE [L/S]	INTERNAL DIAMETER [MM]	DEPTH BELOW INVERT [MM]	MAX PIPE SIZE [MM]	SUMP CAPACITY [M3]	FLOATABLES VOLUME [M3]	BYPASS FLOW RATE [L/S]
TGPT.65.6010	65	1200	1600	375	0.68	0.17	140
TGPT.110.7512	110	1500	1920	525	1.27	0.32	300
TGPT.200.1015	200	1850	2400	600	2.42	0.65	440
TGPT.320.1218	320	2200	2880	675	4.11	1.12	600
TGPT.400.1518	400	2500	2880	750	5.30	1.59	760
TGPT.720.1824	720	3000	3840	825	10.18	3.05	900
TGPT.860.2124	860	3500	3840	900	13.86	4.16	1250
TGPT.1350.2430	1350	4000	4800	1050	22.62	6.79	1700

Models shown are standard range. Additional retention chamber length can be added for increased spill capacities in all sizes. All units can be supplied with Class B, Class D or Class G manhole covers.

TORNADO GPT

OFFLINE LAYOUT

TREATMENT EFFICIENCIES

POLLUTANT	EFFICIENCY
Gross Pollutants (GP)	99.99%
Total Suspended Solids (TSS)	70%
Total Phosphorus (TP)	30%
Total Nitrogen (TN)	0%
Hydrocarbon	90%

Ask Protector to check site MUSIC model for precise efficiencies.

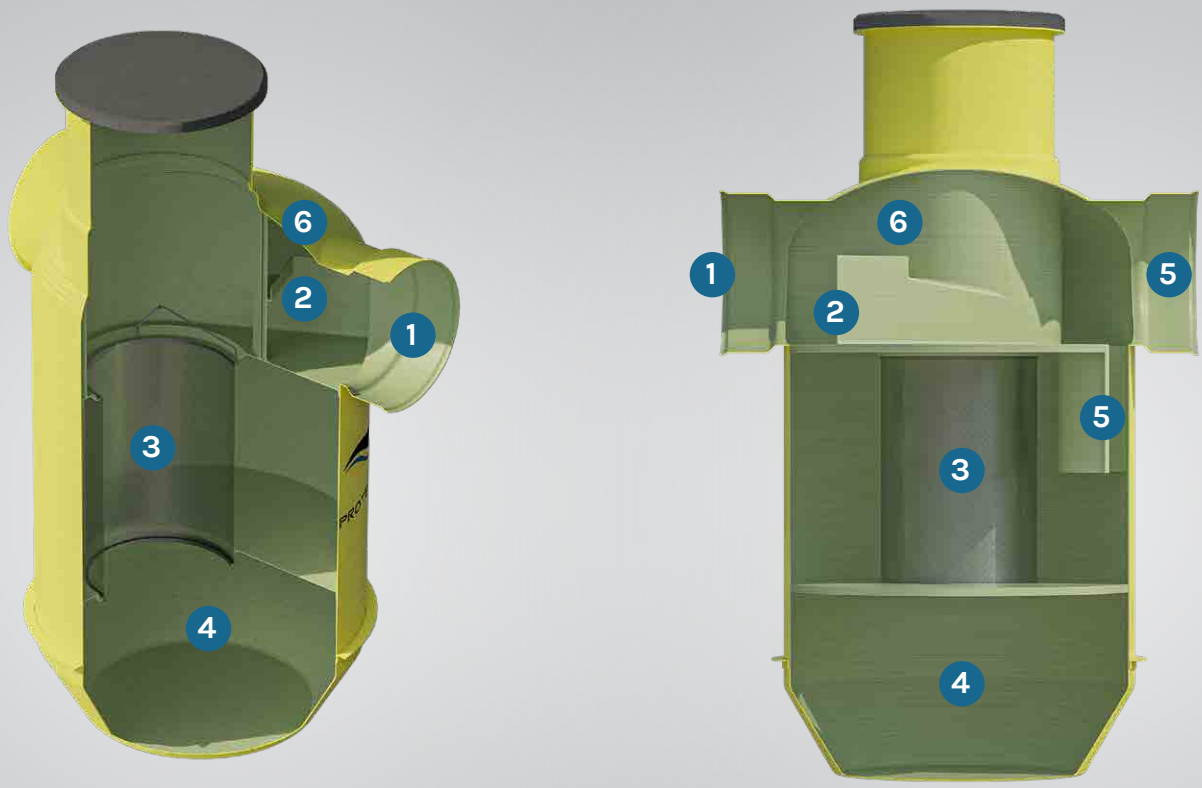
FOR LARGE VOLUME SITES

The Tornado GPT by Protector is based on a continuous deflective separation (CDS) technology available in both inline and offline configurations. TGPT offers a 95% reduction for Gross pollutants of above 1mm and 95% removal of sediments above 200 m. TGPT run on a low life cycle cost with more stormwater treated than counter treatment designs. The inline system features an internal bypass, allowing for easy installation and retrofitting in existing drainage systems.

OFFLINE TORNADO GPT SPECIFICATIONS

MODEL	TREATMENT FLOW RATE [L/S]	INTERNAL DIAMETER [MM]	DEPTH BELOW INVERT [MM]	MAX PIPE SIZE [MM]	SUMP CAPACITY [M3]	FLOATABLES VOLUME [M3]	BYPASS FLOW RATE [L/S]
TGPTO.130.912	130	1200	1600	375	0.68	0.17	SITE SPECIFIC
TGPTO.200.1015	200	1500	1920	525	1.27	0.32	
TGPTO.320.1218	320	1850	2400	600	2.42	0.65	
TGPTO.465.1520	465	2200	2880	675	4.11	1.12	
TGPTO.730.1824	730	2500	2880	750	5.30	1.59	
TGPTO.1090.2128	1090	3000	3840	825	10.18	3.05	
TGPTO.1430.2530	1430	3500	3840	900	13.86	4.16	
TGPTO.1900.3032	1900	4000	4800	1050	22.62	6.79	

Models shown are standard range. Additional retention chamber length can be added for increased spill capacities in all sizes. All units can be supplied with Class B, Class D or Class G manhole covers.



PROCESS

The Tornado GPT system is based on the vortex whirlpool flow process, which forms the basis of its operation. This natural separation technique is combined with Protector's unique screen design to ensure the highest efficiency is achieved.

1. Polluted stormwater flows from capture areas such as car parks, residential areas, shopping precincts, or commercial developments into the Tornado GPT system.

2. The stormwater enters the Tornado GPT system, deflecting off the bypass weir and into the vortex chamber. The walls of the vortex chamber promote the rotational flow of the polluted stormwater, creating a vortex whirlpool. This whirlpool movement forces trash, debris, floatables, and sediment towards the center of the deflector screen.

3. The deflector screen has its ingress at an angle of 120 degrees from the direction of flow, making it difficult for any debris, trash, or non-dissolved particles to pass through the screen during flow, while still allowing water to flow freely. The screen is designed to prevent any particle larger than 4mm from passing through, ensuring that the Tornado GPT system efficiently captures gross pollutants and removes them from the stormwater flow.

4. The motion of the water in the Tornado GPT system forces trash and debris down to the bottom of the chamber, where sediments settle. Once the water flow and whirlpool in the Tornado GPT system subside, sediments settle while floatables are able to rise back to the water level of the tank, as defined by the invert level of the inlet and outlet. At this point, all sediment and smaller, heavier particles will have settled to the bottom, allowing only large floatables to rise. Due to the small 4mm gaps in the screen, no particles will float through. Regular maintenance of the Tornado GPT ensures a long and efficient life.

5. The outlet section of the Tornado GPT system is designed to be simple and efficient. After passing through the deflector screen chamber, the water is separated from the floatables and flows out through the outlet. The water then gradually fills the outlet chamber before flowing out of the system.

6. During periods of high flow, the bypass system in the Tornado GPT operates through a simple weir design. The height of the weir is set according to the inlet size, and as the water level rises above it during high flow, the water flows directly over the weir and towards the outlet. This straightforward design ensures effective flow management during periods of heavy rainfall.

PROTECTOR
PRODUCT RANGE

Protector is a family-owned and operated Australian company with 18 years of experience manufacturing FRP stormwater treatment systems. Protector is dedicated to efficiency, innovation and ease of use. When necessary, Protector improve their product design and manufacturing process to ensure their products are user-friendly and easy to install. Protector is committed to improving waterway quality by capturing and containing pollution in stormwater runoff, delivering cleaner water back into the environment, saving nature for future generations.

TRAP-IT FILTER INSERT

The Protector Trap-It Filter Insert is designed to capture gross pollution that runs into stormwater pits such as plastic, sediments and organic matter. It can be retrofitted within existing infrastructure. It is typically installed as a primary treatment device before nutrient removal filters.

Protector Trap-It Filter Inserts are an efficient, yet low cost alternative to a end of line Gross Pollutant Trap for small to medium catchments.

Oil booms can be fitted to the Trap-It for additional oil and hydrocarbon spill containment.

ECOPROTECTOR

The EcoProtector is a high-capacity trash and litter removal GPT (Gross Pollutant Trap) with particulate removal down to 3mm.

The EcoProtector has been designed to trap solid debris including sediment and hydrocarbons under low velocity conditions.

These units are commonly used as primary treatment for the removal of pollutants in areas such as; residential subdivisions, roads, car parks, industrial applications and other impervious areas that require stormwater treatment.

ENVIROSAVE

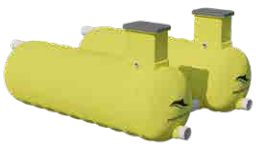
The Envirosave is a compact stormwater management solution that combines a Gross Pollutant Trap (GPT) and Nutrient Filter in one unit. It is designed to remove large debris, pollutants, and excess nutrients from stormwater runoff in residential, commercial, and industrial settings. The Envirosave's compact size makes it easy to install in limited spaces, and its low maintenance requirements and internal bypass system reduce installation and upkeep costs. The Envirosave's innovative design, including its high-quality materials and internal hydrocarbon baffle, ensures it can withstand harsh environmental conditions and heavy traffic loads. The GPT and Nutrient Filter work together to provide high-performance capabilities for efficient stormwater management.

XTREAMFILTER

The Protector XtreamFilter system is a media filled cartridge that absorbs and retains phosphorus and nitrogen, fine silt and heavy metals from stormwater via an upflow treatment process. Hydraulic head forces water through the specialised filter media, providing effective pollution removal. Once rain event has subsided the filter backwashes trapped particles that have accumulated in the media leaving the filter purged and ready for the next inflow. The advanced design ensures long term performance and low cost maintenance, as the backwashed residual material can be easily removed by an evacuation truck.

HYDROVAULT

Hydrovault is Protector's high-capacity sewerage and stormwater storage systems called Retention systems, which are made of fiber glass polymer using a unique chop hoop filament winding technique. These systems are compatible with most stormwater treatment systems and can store almost all types of effluent due to their corrosion-resistant coating. The Hydrovault systems are constructed from fiber-reinforced polymers and built using the chop hoop filament winding construction technique, providing a long-lasting solution. These systems are designed for use in storage, detention, and retention at the end of treatment trains. The Hydrovault can be customized with baffles, pumping stations, and pressurization to meet specific needs.



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