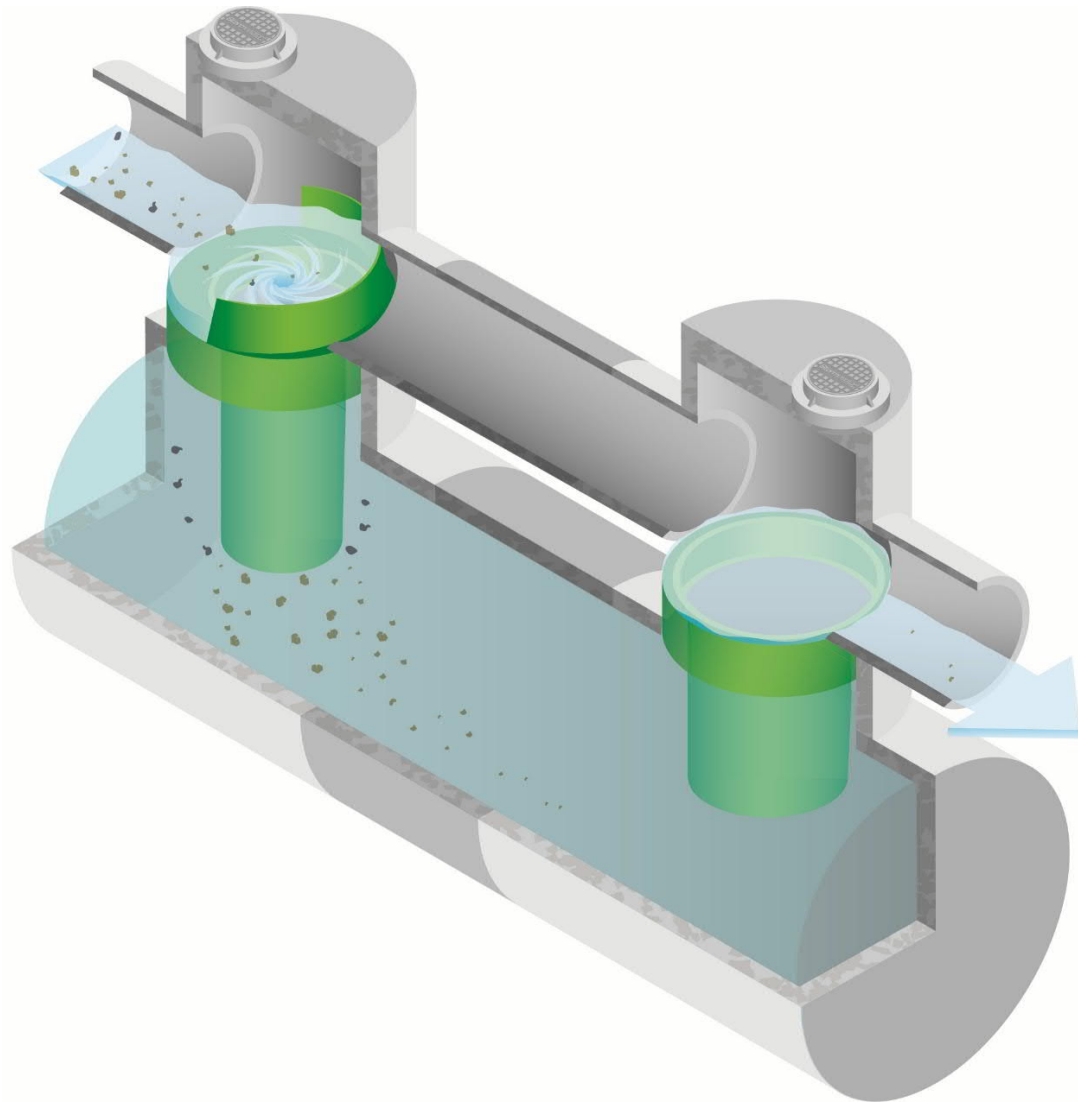


Stormceptor[®] MAX

OWNER'S MANUAL



Stormceptor® MAX Owner's Manual

Stormceptor is protected by one or more of the following patents:

Canadian Patent No. 2,137,942
Canadian Patent No. 2,175,277
Canadian Patent No. 2,180,305
Canadian Patent No. 2,180,383
Canadian Patent No. 2,206,338
Canadian Patent No. 2,327,768
Canadian Patent No. 2,694,159

U.S. Patent No. 5,753,115
U.S. Patent No. 5,849,181
U.S. Patent No. 6,068,765
U.S. Patent No. 6,371,690
U.S. Patent No. 7,582,216 B2
U.S. Patent No. 7,666,303

Australia Patent No. 693,164
Australia Patent No. 707,133
Australia Patent No. 729,096
Australia Patent No. 779,401
Australia Patent No. 2008,279,378
Australia Patent No. 2008,288,900

Indonesia Patent No. 0007058

Japan Patent No. 3581233
Japan Patent No. 9-11476
Japan Patent No. 2010-522012

Korean Patent No. 0519212

Malaysia Patent No. 118987

New Zealand Patent No. 314,646
New Zealand Patent No. 583,008
New Zealand Patent No. 583,583

South African Patent No. 2010/00682
South African Patent No. 2010/01796

Other Patents Pending

Congratulations!

Your selection of a Stormceptor MAX means that you have chosen the most recognized and efficient stormwater oil/sediment separator available for protecting the environment. Stormceptor MAX is a pollution control device often referred to as a "Hydrodynamic Separator (HDS)" or an "Oil Grit Separator (OGS)", engineered to remove and retain pollutants from stormwater runoff to protect our lakes, rivers and streams from the harmful effects of non-point source pollution.

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1 – Stormceptor® MAX Overview

Stormceptor MAX is a patented stormwater quality treatment technology most often integrated into the underground storm drain network for the purpose of stormwater pollution prevention. Stormceptor MAX is designed to remove sediment, total suspended solids (TSS), other pollutants attached to sediment, hydrocarbons and free oil from stormwater runoff. Collectively the Stormceptor MAX provides spill protection and prevents non-point source pollution from entering downstream waterways.

Key benefits of Stormceptor® MAX include:

- Removes sediment, suspended solids, debris, nutrients, heavy metals, and hydrocarbons (oil and grease) from runoff and snowmelt
- Prevent scour or re-suspension of trapped pollutants
- Provides sediment and oil storage
- Provides spill control for accidents, commercial and industrial developments
- Easy to inspect and maintain (vacuum truck)
- "STORMCEPTOR" is clearly marked on the access cover (excluding inlet designs)
- Customized design for large catchments
- Dedicated team of experts available to provide support

Please Maintain Your Stormceptor® MAX

To ensure long-term environmental protection through continued performance as originally designed for your site, Stormceptor MAX must be maintained, as any stormwater treatment practice does. The need for maintenance is determined through bi-annual inspections of the Stormceptor MAX. Procedures for inspection are provided within section 4 of this document. Typically, maintenance of the Stormceptor MAX is performed from the surface via vacuum truck. Depending on the size of the custom designed system, entry into the lower chamber, via maintenance access manhole, may be necessary.

If you require information about Stormceptor MAX, or assistance in finding resources to facilitate inspections or maintenance of your Stormceptor MAX please call your local Stormceptor Licensee or Imbrium® Systems.

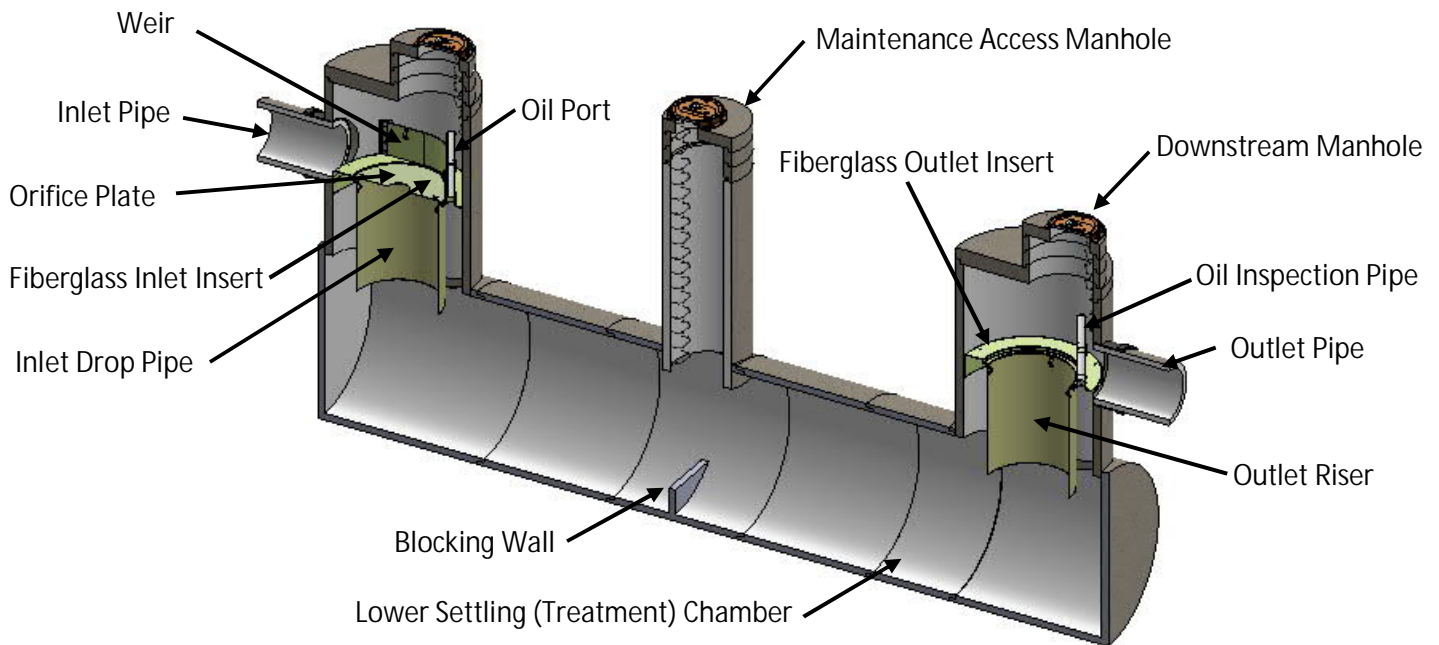
2 – Stormceptor® MAX Operation & Components

Stormceptor MAX is a site-specific flexibly designed underground stormwater quality treatment device that is unparalleled in its effectiveness for pollutant capture and retention using patented flow separation technology.

Similar to the original Stormceptor STC, the Stormceptor MAX creates a non-turbulent treatment environment below the insert platform within the system. The inlet insert diverts water into the lower treatment chamber, allowing free oils and debris to rise, and sediment to settle at relatively low velocity. These pollutants are trapped and stored below the inserts within the settling chamber. The patented Stormceptor MAX design prohibits the scour and release of captured pollutants, ensuring superior water quality treatment and protection during even the most extreme storm events.

Stormceptor MAX Schematic and Component Functions

Below is a schematic of a common Stormceptor MAX configuration with key components identified and their functions briefly described.



- Upstream/Downstream Manhole – houses the Stormceptor MAX inlet/outlet insert components
- Fiberglass inserts – separates vessel into upper and lower chambers
- Weir – directs incoming stormwater and oil spills into the lower treatment chamber, while allowing peak flows to bypass the lower chamber into a bypass conveyance pipe (not shown)
- Orifice plate – controls the inlet flow into the lower settling chamber and prevents scour of accumulated pollutants
- Inlet drop pipe – conveys stormwater into the lower settling chamber and provides a vacuum line access for sediment removal
- Lower settling chamber – patented custom designed precast structure for the storage of captured pollutants
- Outlet riser – conveys treated water into the outlet pipe and provides a vacuum line access for sediment removal
- Oil inspection pipe – primary access for measuring oil depth and for oil removal
- Blocking wall – weir wall installed into the lower settling chamber to provide an area for captured sediment to accumulate; Longer structures may have multiple blocking walls for ease of inspection and maintenance
- Maintenance access manhole – allows for maintenance access into the lower settling chamber, typically installed over the blocking wall; Longer structures may have multiple maintenance access manholes for ease of inspection and maintenance

3 – Stormceptor® MAX Configuration and Identification

Configuration

Stormceptor MAX is available in custom configurations using either reinforced concrete pipe or reinforced concrete box culvert for the lower treatment chambers.

In the Stormceptor MAX, a set of patented, engineered fiberglass inserts are used to control stormwater in and out of the lower treatment chamber. The lower treatment chamber is where sediment removal occurs. Stormceptor MAX can be designed in many various custom configurations.

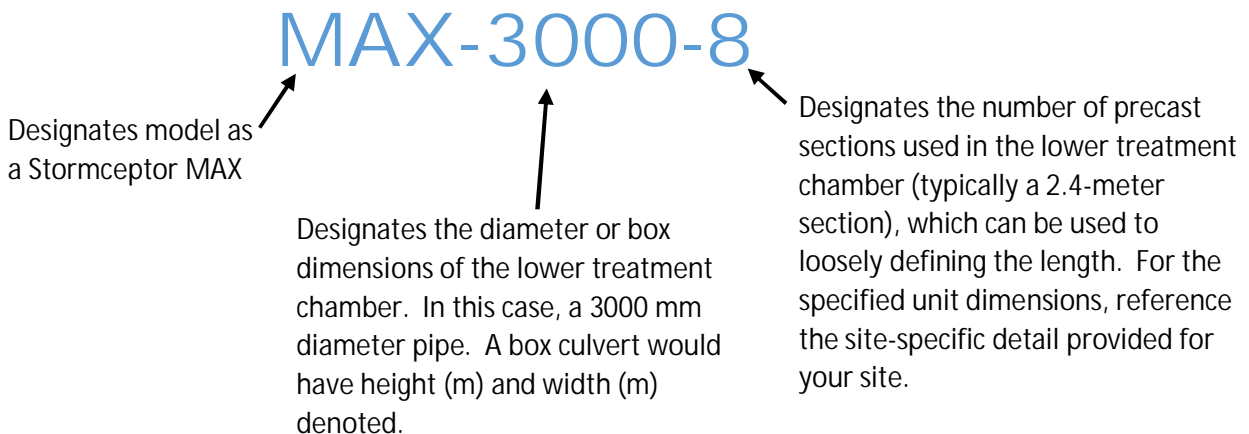
Identification

Each unit is easily identifiable as a Stormceptor by the trade name "Stormceptor" embossed on each access cover at the surface. To determine the location of the "inlet" Stormceptor MAX insert, remove one of the access covers and look down into access riser as the Stormceptor insert will be visible. The weir should be clearly visible around the orifice plate & inlet drop pipe opening, and the orifice plate itself is a clear indication you are looking at the inlet insert.

Once the location and orientation of the Stormceptor MAX is determined, the approximate lower treatment chamber storage volume and depth should be measure in the field for maintenance preparation.

A metal serial number tag containing the model number has been affixed to the inside of the unit, on the fiberglass inserts. If the unit does not have a serial number, or if there is any uncertainty regarding the size of the unit using depth measurements, please contact your local Stormceptor Representative for assistance.

The Stormceptor MAX is custom sized for each projects' site specific conditions. It is important to note the unit's dimensions and volumes in this manual and saved for future reference so that service providers can use this information when inspecting and maintaining the unit. Below is an example of a Stormceptor MAX model name.



4 – Stormceptor® MAX Inspection & Maintenance

Regular inspection and maintenance is a cost-effective way to maximize water resource protection for all stormwater pollution control practices, and is required to ensure proper long-term functioning of the Stormceptor MAX. Both inspection and maintenance of the Stormceptor MAX is easily performed from the surface. Stormceptor's patented technology has no moving parts, simplifying the inspection and maintenance process.

Please refer to the following information and guidelines before conducting inspection and maintenance activities.

When is inspection needed?

- Post-construction inspection is required prior to putting the Stormceptor into service.
- Routine inspections are recommended during the first year of operation to accurately assess the sediment accumulation.
- Inspection frequency in subsequent years is based on the maintenance plan developed in the first year.
- Inspections should also be performed immediately after oil, fuel, or other chemical spills.

When is maintenance cleaning needed?

- For optimum performance, the unit should be cleaned out once the sediment depth reaches the recommended maintenance sediment depth, which is either approximately 15% of the unit's total storage capacity. The frequency should be adjusted based on historical inspection results due to variable site pollutant loading.
- Sediment removal is easier when removed on a regular basis at or prior to the recommended maintenance sediment depth, as sediment build-up can compact making removal more difficult.
- The unit should be cleaned out immediately after an oil, fuel or chemical spill.

What conditions can compromise Stormceptor® MAX performance?

- If construction sediment and debris is not removed prior to activating the Stormceptor MAX unit, maintenance frequency may be reduced.
- If the system is not maintained regularly and fills up with sediment and debris beyond the recommended maintenance capacity pollutant removal efficiency may be reduced.
- If an oil spill(s) exceeds the oil capacity of the system, subsequent spills may not be captured.
- If debris clogs the inlet of the system, removal efficiency of sediment and hydrocarbons may be reduced.
- If a downstream blockage occurs, a backwater condition will occur and removal efficiency of sediment and hydrocarbons may be reduced.

What training is required?

The Stormceptor MAX is to be inspected and maintained by professional vacuum cleaning service providers with experience in the maintenance of underground tanks, sewers and catch basins. For typical inspection and maintenance activities, no specific supplemental training is required for the

Stormceptor MAX. Information provided within this Manual (provided to the site owner) contains sufficient guidance to maintain the system properly.

In unusual circumstances, such as if a damaged component needs replacement or some other condition requires manned entry into the vessel, confined space entry procedures must be followed. Only professional maintenance service providers trained in these procedures should enter the vessel. Service provider companies typically have personnel who are trained and certified in confined space entry procedures according to local, provincial, and national standards.

What equipment is typically required for inspection?

- Manhole access cover lifting tool
- Oil dipstick / Sediment probe with ball valve (typically ¾-inch to 1-inch diameter)
- Flashlight
- Camera
- Data log / Inspection Report
- Safety cones and caution tape
- Hard hat, safety shoes, safety glasses, and chemical-resistant gloves

Recommended Stormceptor® MAX Inspection Procedure:

- Stormceptor MAX is typically inspected from grade through a standard surface manhole access cover.
- Sediment and oil depth inspections are performed with a sediment probe and oil dipstick.
- Oil depth is measured through the oil inspection pipe.
- Sediment depth can be measured through the oil inspection port or the outlet riser pipe.
- Inspections also involve a visual inspection of the internal components of the system.



Figure 1: Inspect at grade



Figure 2: Check for large debris and standing water above the fiberglass inserts

What equipment is typically required for maintenance?

- Vacuum truck equipped with water hose and jet nozzle
- Small pump and tubing for oil removal
- Manhole access cover lifting tool
- Oil dipstick / Sediment probe with ball valve (typically ¾-inch to 1-inch diameter)
- Flashlight
- Camera
- Data log / Inspection Report
- Safety cones
- Hard hats, safety shoes, safety glasses, chemical-resistant gloves, and hearing protection for service providers
- Gas analyzer, respiratory gear, and safety harness for specially trained personnel if confined space entry is required



Figure 35: Vacuum truck line, at-grade



Figure 4: Ensure no blockage for vacuum line

Recommended Stormceptor® MAX Maintenance Procedure

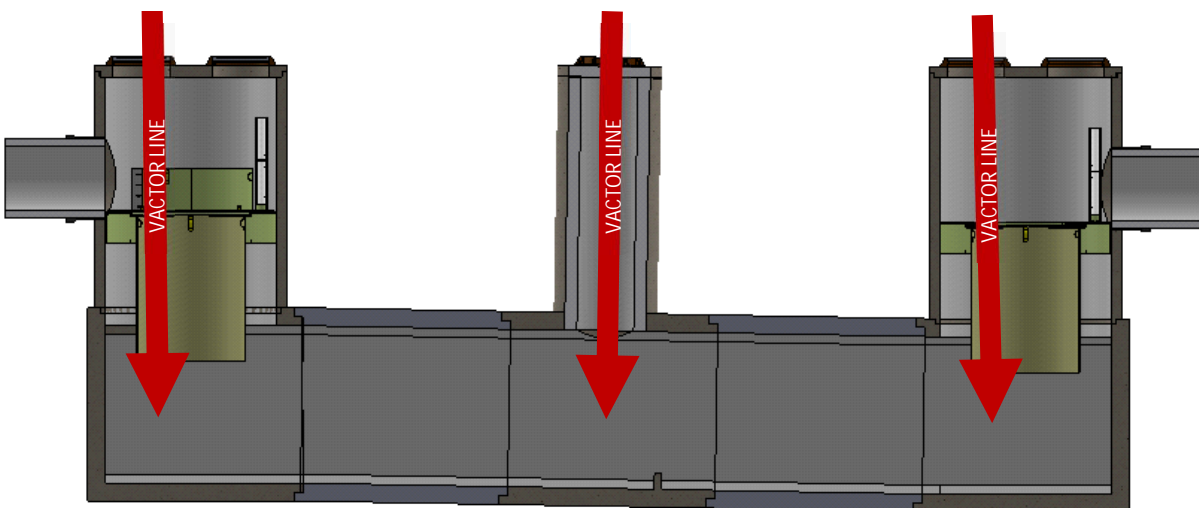
Maintenance of Stormceptor MAX is performed using a vacuum truck.

No entry into the unit is required for maintenance if there is a proper number of maintenance access points to the lower chamber. **DO NOT ENTER THE STORMCEPTOR CHAMBER** unless you have the proper personal safety equipment, have been trained and are qualified to enter a confined space, as identified by local Occupational Safety and Health Regulations (e.g. 29 CFR 1910.146 or Canada Occupational Safety and Health Regulations – SOR/86-304). Without the proper equipment, training and

permit, entry into confined spaces can result in serious bodily harm and potentially death. Consult local, provincial, and/or state regulations to determine the requirements for confined space entry. Be aware, and take precaution that the Stormceptor fiberglass inserts may be slippery. In addition, be aware that some units do not have a platform to cover the outlet riser pipe that leads to the submerged, lower chamber.

- Ideally maintenance should be conducted during dry weather conditions when no flow is entering the unit.
- Stormceptor MAX is to be maintained through a standard surface manhole access cover.
- Insert the oil dipstick into the oil inspection port. If oil is present, pump off the oil layer into separate containment using a small pump and tubing.
- Maintenance cleaning of accumulated sediment is performed with a vacuum truck.
- For all Stormceptor MAX models, a vacuum hose is inserted into the lower treatment chamber via the outlet riser pipe, inlet drop pipe, and any additional maintenance access risers provided. Reference the unit details at the end of this Manual for number of maintenance access points provided for a specific unit.

Figure 5: Vactor Line Access



- Using the vacuum hose, decant the water from the lower treatment chamber into a separate containment tank or to the sanitary sewer, if permitted by the local regulating authority.
- Remove the sediment sludge from the bottom of the unit using the vacuum hose. Since Stormceptor MAX units are larger than standard Stormceptor units, a flexible hose is often connected to the primary vacuum line for ease of movement in the lower treatment chamber.
- Units that have not been maintained regularly, have surpassed the maximum recommended sediment capacity, or contain damaged components may require manned entry by trained personnel using safe and proper confined space entry procedures.

What is required for proper disposal?

The requirements for the disposal of material removed from Stormceptor units are similar to that of any other stormwater treatment Best Management Practices (BMP). Local guidelines should be consulted prior to disposal of the separator contents. In most areas the sediment, once dewatered, can be disposed of in a sanitary landfill. It is not anticipated that the sediment would be classified as hazardous waste. This could be site and pollutant dependent. In some cases, approval from the disposal facility operator/agency may be required. Note that due to the larger-than-average size of Stormceptor MAX units, larger-than-typical pollutant volumes should be anticipated.

What about oil spills?

Stormceptor MAX is often implemented in areas where there is high potential for oil, fuel or other hydrocarbon or chemical spills. Stormceptor MAX units should be cleaned immediately after a spill occurs by a licensed liquid waste hauler. You should also notify the appropriate regulatory agencies as required in the event of a spill.

What if I see an oil rainbow or sheen at the Stormceptor® MAX outlet?

With a steady influx of water with high concentrations of oil, a sheen may be noticeable at the Stormceptor MAX outlet. This may occur because a hydrocarbon rainbow or sheen can be seen at very small oil concentrations (< 10 ppm). Stormceptor is effective at removing 95% of free oil, and the appearance of a sheen at the outlet with high influent oil concentrations does not mean that the unit is not working to this level of removal. In addition, if the influent oil is emulsified, the Stormceptor MAX will not be able to remove it. The Stormceptor is designed for free oil removal and not emulsified or dissolved oil conditions.

What factors affect the costs involved with inspection/maintenance?

The Vacuum Service Industry for stormwater drainage and sewer systems is a well-established sector of the service industry that cleans underground tanks, sewers and catch basins. Costs to clean Stormceptor MAX units will vary due to their custom-sized nature. Inspection and maintenance costs are most often based on unit size, the number of units on a site, sediment/oil/hazardous material loads, transportation distances, tipping fees, disposal requirements and other local regulations.

What factors predict maintenance frequency?

Maintenance frequency will vary with the amount of pollution on your site (number of hydrocarbon spills, amount of sediment, site activity and use, etc.). It is recommended that the frequency of maintenance be increased or reduced based on local conditions. If the sediment load is high from an unstable site or sediment loads transported from upstream catchments, maintenance may be required semi-annually. Conversely once a site has stabilized, maintenance may be required less frequently). Maintenance should be performed immediately after an oil spill or once the sediment depth in Stormceptor MAX reaches approximately 15% of the unit's total storage capacity.

Replacement parts

Since there are no moving parts during operation in a Stormceptor® MAX, broken, damaged, or worn parts are not typically encountered. Therefore, inspection and maintenance activities are generally focused on pollutant removal. However, if replacements parts are necessary, they may be purchased by contacting your local Stormceptor Representative, or Imbrium Systems.

The benefits of regular inspection and maintenance are many – from ensuring maximum operation efficiency, to keeping maintenance costs low, to the continued protection of natural waterways – and provide the key to Stormceptor's long and effective service life.

Stormceptor Inspection and Maintenance Log

Stormceptor® MAX Model No: _____

Allowed Sediment Depth: _____

Allowed Hydrocarbon Depth: _____

Total Wet Volume: _____

Serial Number: _____

Installation Date: _____

Location Description of Unit: _____

Other Comments: _____

Contact Information

Questions regarding the Stormceptor® MAX can be addressed by contacting your area Stormceptor Licensee, Imbrium Systems, or visit our website at www.ImbriumSystems.com.

Stormceptor Licensees:

CANADA

Lafarge Canada Inc.

www.lafargepipe.com

403-292-9500

780-479-5232

204-958-6348

306-652-7232

Calgary, AB

Edmonton, AB

Winnipeg, MB | Thunder Bay, ON | Sault Ste Marie, ON

Saskatoon, SK

Langley Concrete Group

www.langleyconcretegroup.com

604-502-5236

BC

Forterra Drainage

www.forterrabp.com

519-622-7574 / 1-888-888-3222

ON

Lécuyer et Fils Ltée.

www.lecuyerbeton.com

450-454-3928 / 1-800-561-0970

QC

Strescon Limited

www.strescon.com

902-494-7400

506-633-8877

NS, NF

NB, PE

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www.stormceptor.com