State of New Jersey

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DIVISION OF WATERSHED PROTECTION AND RESTORATION
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March 27, 2025

Charles Kelly
National Manager - Water Solutions
Holcim Australia Pty Ltd
Humes Concrete Products
18 Little Gribb Street
Milton QLD 4064
Australia

Re: MTD Lab Certification
HumeFilter Universal Pollutant Trap 1200
Offline Installation

TSS Removal Rate 80%

Dear Dr. Kelly:

The Stormwater Management rules under N.J.A.C. 7:8-5.2(f) and 5.2(j) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). Holcim Australia PTY Ltd. has requested a Laboratory Certification for the HumeFilter Universal Pollutant Trap 1200 (HumeFilter UPT1200).

The project falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advanced Technology" dated August 4, 2021. The applicable protocol is the "New Jersey Laboratory Testing Protocol to Assess Total Suspended Solids Removal by a Filtration Manufactured Treatment Device" dated January 14, 2022, updated April 25, 2023.

NJCAT verification documents submitted to the NJDEP indicate that the requirements of the aforementioned protocol have been met or exceeded. The NJCAT letter also included a recommended certification TSS removal rate and the required maintenance plan. The NJCAT Verification Report with the Verification Appendix (dated March 2025) for this device is published online at http://www.njcat.org/verification-process/technology-verification-database.html.

The NJDEP certifies the use of the HumeFilter UPT 1200 by Holcim Australia PTY Ltd. at a TSS removal rate of 80% when designed, operated and maintained in accordance with the information provided in the Verification Appendix and the following conditions:

1. The maximum treatment flow rate (MTFR) for the manufactured treatment device (MTD) is calculated using the New Jersey Water Quality Design Storm (1.25 inches in 2 hrs) in N.J.A.C. 7:8-5.5.

2. The HumeFilter UPT 1200 stormwater treatment device shall be installed using the same configuration reviewed by NJCAT and shall be sized in accordance with the criteria specified in item 6 below.

3. This HumeFilter UPT 1200 stormwater treatment device cannot be used in series with another MTD or a media filter (such as a sand filter) to achieve an enhanced removal rate for total suspended solids (TSS) removal under N.J.A.C. 7:8-5.5.

4. Additional design criteria for MTDs can be found in Chapter 11.3 of the New Jersey Stormwater Best Management Practices (NJ Stormwater BMP) Manual which can be found on-line at https://dep.nj.gov/stormwater/.

5. The maintenance plan for a site using this device shall incorporate, at a minimum, the maintenance requirements for the HumeFilter UPT 1200. A copy of the maintenance plan is attached to this certification. However, it is recommended to review the maintenance website at: https://www.humes.com.au/sites/humes/files/docs/humefilter_maintenance_guide.pdf for any changes to the maintenance requirements.

6. Sizing Requirements:

   The example below demonstrates the sizing procedure for the HumeFilter UPT 1200:

   Example: A 0.25-acre impervious site with a slope of 5% is to be treated to 80% TSS removal using a HumeFilter UPT 1200. The hydraulically most distant point to the inlet of the HumeFilter UPT 1200 is 110 feet. The site is located in an area for which the projected 2-year storm rainfall depth was calculated to be 3.84 inches.

   The selection of the appropriate model of a HumeFilter UPT 1200 is based upon both the maximum inflow drainage area and the MTFR. It is necessary to calculate the required model using both methods and to use the largest model determined by the two methods.

   Inflow Drainage Area Evaluation:

   The drainage area to the HumeFilter UPT 1200 in this example is 0.25 acres. Based upon the information in Table 1 below, one HumeFilter UPT 1200 would be able to treat the runoff without exceeding the maximum allowable drainage area.

   Maximum Treatment Flow Rate (MTFR) Evaluation:

   The site runoff (Q) was based on the following:

   CN = 98 (Curve Number for impervious)
   Dimensionless Unit Hydrograph (DUH) = SCS Standard DUH (peak rate factor of 484)
   Time of concentration = 0.8 minutes
   Q = 0.77 cfs

Given the site runoff is 0.77 cfs and based on Table 1 below, two of the HumeFilter UPT 1200 models, each with an MTFR of 0.423 cfs would be required to remove 80% of the TSS from the impervious area without exceeding the MTFR.

The MTFR evaluation results will be used since that method results in the highest minimum configuration determined by the two methods.

The sizing table corresponding to the available system model is noted below. Additional specifications regarding the HumeFilter UPT 1200 can be found in the Verification Appendix.

Table 1: HumeFilter UPT 1200 Model and Associated MTFRs

HumeFilter UPT	Maximum Treatment Flow Rate (cfs)	Effective Filter Treatment Area (sf)	Maximum Inflow Drainage Area (acres)
1200 Model	0.423	1173	0.306

Be advised a detailed maintenance plan is mandatory for any project with a Stormwater BMP subject to the Stormwater Management Rules, N.J.A.C. 7:8. The plan must include all the items identified in the Stormwater Management Rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of inspection and maintenance equipment and tools, specific corrective and preventative maintenance tasks, indication of problems in the system, and training of maintenance personnel. Additional information can be found in Chapter 8: Maintenance and Retrofit of Stormwater Management Measures.

If you have any questions regarding the above information, please contact Lisa Schaefer of my office at lisa.schaefer@dep.nj.gov.

Sincerely,

Gabriel Mahon, Chief
Bureau of NJPDES Stormwater Permitting
Division of Watershed Protection and Restoration
New Jersey Department of Environmental Protection

Attachment: Maintenance Plan

c: Richard Magee, NJCAT

Humes

Strength. Performance. Passion.

HumeFilter® UPT
Inspection & Maintenance Guide

Version 1

Purpose of this guide

This guide outlines the maintenance procedures and requirements for Humes HumeFilter® units.

Where the contents of this guide differ from project specifications and drawings, supervisory personnel should consult with the Humes team. In the event of any conflict between the information in this guide and local legislative requirements, the legislative requirements will take precedence.

It is the responsibility of the site owner and its contractors to determine the site's suitable access and location for maintenance plant and equipment.

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Safety advice

The Humes HumeFilter® unit must be maintained in accordance with all relevant health and safety requirements, including the use of PPE and fall protection where required.

Confined space entry

Maintenance of the Humes HumeFilter® will require limited entry, however, if entry into the unit is required, then the device is deemed a confined space.
As such, if entering the unit, all equipment and training must comply to SHE regulations. It is the responsibility of the contractor or person/s entering the unit to proceed safely at all times.

Personal safety equipment

The contractor is responsible for the provision of appropriate personal protection equipment including, but not limited to safety boots, hard hat, reflective vest, protective eyewear, gloves and fall protection equipment. Make sure all equipment is used by trained and certified personnel, and is checked for proper operation and safety features prior to use.

Handling

The customer, or their contractor, is responsible for the removal of access lids from the Humes HumeFilter® unit. The customer or contractor should familiarise themselves with the device and site constraints, and particular attention should be given to safety hazards such as overhead power lines and other services in the vicinity when considering the position of plant and equipment.

Maintenance overview

To ensure ongoing long-term environmental protection Humes HumeFilter® needs to be maintained every twelve months.

On-going maintenance frequency will be determined after initial quarterly inspections in the first year after install. However, only annual maintenance is anticipated for all units installed within drainage infrastructure. Inspections can be performed by anyone following this document.

Comprehensive maintenance is performed from the surface via vacuum truck. Companies capable of performing this maintenance can be found by researching sewer cleaning or liquid waste removal in your local area.

The Humes HumeFilter® is comprised of several structural and functional components:

- A cylindrical precast concrete structure available in a range of diameters and depths acts as a vessel providing structural support and storage for filtered pollutants.
- A rigid high-strength stainless steel plinth sits in the lower section of the concrete chamber creating a 500mm deep sump for the deposit/accumulation of sediments & debris.
- The multistage filter arrangement is seated on top of the plinth, which comprises three basic elements:
    1. An inner stainless steel perforated screen
    2. A stainless steel basket containing a layer of granulated activated carbon (GAC)
    3. A 50 mm wide pleated cartridge filter
- A rigid high-strength stainless steel insert sits on top of the filters, which performs all of the hydraulic control for the system.
- A heavy duty lid and surround are designed for SM1600 vehicles as per AS5100 (2017), and we can provide custom designs for loads that exceed the AS5100 requirement.

Operation of the Humes HumeFilter® is as follows:

- Water enters via an inlet pipe through the concrete chamber, into the centre of the stainless steel insert, then into the centre of the chamber. Note: it's possible to have a grated inlet in the centre of the lid to pick up overland flow.
- Sediments and other heavy materials fall into the 500mm deep sump of the device.
- Water passes through the filter arrangement from inside to out under the hydraulic head created by a 150mm difference between the inlet and outlet pipe invert levels.
- Water first passes the through the screen, then the GAC layer, and finally through the pleated cartridge for polishing. The filters are designed to only operate at 34% of their capability , allowing a redundancy of 66% to cater for blocking over time.
- Once through the pleated cartridge, the water then rises up between the outside of the cartridge and the concrete chamber, and through a series of v-notches in a rim weir on the outer edge of the stainless steel insert.
- The water passes through these v-notches and onto the return channel toward the outlet pipe. The v-notches are important to ensure that the flow on the return channel remains laminar so as to minimise losses through the system and into the downstream drainage network.
- While the Humes HumeFilter® is designed as an off-line device, as an added factor of safety, it is also capable of internally bypassing should there ever be a blockage in the filters or the bypass pipe.
- Being a cylindrical chamber, the outlet pipe can be located at almost any angle relative to the inlet pipe.

Inspection procedure

Humes HumeFilter® units are sized to require maintenance every year after initial inspections have determined the pollutant load of installations.

New installs require quarterly inspections to determine the pollutant load of the drainage system and the manufacturer's recommendation is to conduct these every 3 months.

Anyone can inspect the Humes HumeFilter® to determine the levels of sediment in the device using the following procedure:

1. Locate the Humes HumeFilter®.
2. Remove the lid.
3. Conduct a visual inspection of the inlet and outlet pipes to ensure there are no blockages.
4. Conduct a visual inspection of the stainless steel insert and check for damage; also check for obstructions in entry to the center of the stainless steel insert.
6. Use the Sludge Judge to determine the levels of sediment in the device.
7. Lower the Sludge Judge all the way to the bottom of the Humes HumeFilter® chamber. At the base of the unit; the float valve will open allowing materials to flow in. It should be lowered in slowly and not plunged to the bottom.
8. When at the bottom of the unit the clear pipe of the Sludge Judge will be filled to the top water level with water (and sediment at the bottom). Tug slightly on the rope to set the check valve trapping the mixture inside.
9. When the Sludge Judge has been raised clear of the unit, the amount of sediment in the base of the device can be read using the markers on the clear pipe section.
10. To empty the Sludge Judge, touch the check valve pin against a hard surface; this opens the check valve allowing the contents to drain out. The depths of the sediment should be recorded.

The Humes HumeFilter® will require a clean out when the sediment levels on all models reaches 500mm.

Maintenance frequency & procedure

The Humes HumeFilter® unit must be maintained in accordance with all relevant health and safety requirements, including the use of PPE and fall protection where required.

Maintenance frequency

It is generally recommended that inspection of the unit to be undertaken every three months for the first year of operation. This schedule may then be relaxed after a year, when confidence is gained regarding the actual pollutant load and run-off generated by the up-stream catchment.

You may elect to undertake inspection yourself or choose to contract a waste management service for a inspection and maintenance package. Contact our team for inspection and maintenance recommendations in your area, if needed.

The need for maintenance can be determined easily by inspecting the unit from the surface. The depth of sediment can be measured from the surface without entry into the Humes HumeFilter® via a clear tube (Sediment sampler available from Humes). For inspection purposes, the sampler can be lowered into the 600mm cast iron lid in the center of the unit.

As a general rule an annual maintenance schedule is recommended. However, maintenance frequency will vary with the volumes of stormwater pollution/ sediment generated by your site based on local conditions. Once site load is established frequency may be anywhere from twice a year to once every three years.

Removal of Hazardous Material

The requirements for the disposal of material removed are similar to that of any other stormwater treatment device. Local guidelines should be consulted prior to disposal.

De-watered sediment may be suitable for disposal via landfill. It is recommended to check with the relevant authorities in your local area as some may require testing of the sediment prior to disposal.

Maintenance procedure

The Humes HumeFilter® storage chamber should be inspected twice annually with a sludge judge/survey staff. If the sediment has reached a level of 500mm it should be maintained as follows:

Annual Interval

- Arrive onsite with a vacuum truck.
- Remove lid.
- Vacuum out the contents of the sump.
- Rinse the exterior and interior of the Stainless Steel insert with clean water, into the sump.
- Backwash the filters by pumping 2,000L of clean water at a rate of 5 - 10 L/s on the external side of the filters, allowing the water to pass from outside the filters to inside the sump.
- A filter exchange is required if the water level on the outside of the filter rises to the level of the return channel.
- If, however, the water freely backwashes through the filters and doesn't reach the return channel level, then the filters can remain until the next inspection.
- Vacuum out any sludges and water retained in the sump.
- Replace lid.

2-year Interval

As above plus:

- Rinse and remove stainless steel insert.
- Rinse and remove used GAC and pleated cartridge.
- Thoroughly rinse the inside of the concrete chamber and then vacuum out the residual material.
- Exchange filters with the replacements brought to site.
- Re-insert the SS insert and replace the lid.
- The used filters are returned to Humesto be emptied, cleaned and re-filled with new GAC.
- The pleated filter is backwashed and allowed to dry. Both filters are returned to stock as replacement filters for future maintenance.

Example Job Safety Analysis or Work Method Statement

The following JSA/WMS is a guide only. It is the responsibility of the cleaning contractor or asset owner to develop their own JSA/WMS in line with their WHS requirements and constraints.

Project/Address:				**Date:**	
Job: Clean out Humes Humefilter®				**Operator**:	
Risk Level:	1 - Extreme	2 - High	3 - Medium	4 - Low	5 - Negligible
Consequences:	Likely to cause very serious harm	Clear potential for serious harm	Similar to risk of driving a car	Little likelihood of any harm	Virtually harmless
Response:	Stop the job	Stop & reassess to find a better way	Control & ensure controls work	Monitor to ensure risk remains low	Continue safe work

Procedure	Possible Hazards	Initial Risk	Controls	Person in charge	End Risk
1. Preliminaries • Confirm unit location & type • Read the technical manual	**Nil**	-	Refer to relevant materials	**Initial** Risk	-
2. Plan the job • Room to access & work on unit with no impact on other property or vehicle • Consider water flows, if excessive move to next job • Condition & status of unit • Identify water fill point • Identify waste dump point	• Climbing in/out of truck • Units have high risk of containing syringes	**3** **4**	• Refer to moving around vehicle • safety plan Wear PPE & never reach into accumulated matter with hands. If needle stick injury occurs, wash the affected area with soap & water. Report incident, seek medical attention	Operator	**4** **5**
3. Establish job site • Over 60km/h requires traffic mgt • Within 6.4m of overhead power lines will require a spotter	• Traffic • Pedestrians • Overhead power lines	**2**	• Devise a relevant Traffic • Management WMS • Ensure barriers & signs redirect pedestrians • Ensure spotter is present	Operator	**5**
4. Assemble cleaning equipment • Position vacuum hose to remove debris from unit	• Infection • Sharp edges • Manual handling • Falling equipment • High pressure water	**3**	• Wash hands • Wear gloves & remove sharp edges/burrs on equipment • Follow a manual handling WMS • Store equipment securely on vehicle • Inspect vacuum hose fittings • Inspect hose daily & leak test • Never cap jetting hose • Never adjust pump pressures • Max reducer on 1" hose is 3/4" • No reducers on 1/2" hose • Fittings to be firmly secured using a spanner	Operator	**5**
5. Open the GPT cover • Remove lid using manhole lifting procedure • If lid exceeds safe lift limits, use mechanical lifting device	• Manual handling • Open manholes	**3**	• Follow manual handling SWP Follow manhole lifting SWP	Operator	**5**
6. Start Cleaning • If required to enter pit, follow confined space entry procedure • Option to transplant remaining water upstream or to sewer (with permission from authorities) • Vacuum all material out of sump until empty & clear • Clean pit interior using water jet	• Manual handling • Eye injury from flying debris • Noise • People inside exclusion zone • Confined space entry	**3**	• Follow manual handling SWP • Wear eye protection • Wear hearing protection • Stop operation until area clear • Only essential personnel within exclusion zone • Prevent whipping with minimum hose slack • Follow confined space SWP	Operator	**5**
7. Finish cleaning • Replace lid ensuringit is firmly & securely in place • Ensure all waste is vacuumed & site is clean prior to packing up • Complete CWS recording with all details & any issues	• Manual handling	**3**	• Follow manual handling SWP	Operator	**5**

Humes

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