State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Science, Research and Technology
Bureau of Sustainable Communities & Innovative Technologies
PO Box 409
Trenton, NJ 08625-0409
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JON S. CORZINE
Governor

LISA P. JACKSON
Commissioner

March 19, 2007

Hans De Bruijn
Sales Engineer
Terre Hill Concrete Products
P.O. Box 10
Terre Hill, PA 17581

RE: Terre Kleen™ Storm Water Treatment Device by Terre Hill Concrete Products.

Dear Mr. De Bruijn:

In accordance with the Energy and Environmental Technology Verification (EETV) Act at N.J.S.A. 13:1D-134, the New Jersey Department of Environmental Protection (NJDEP) is pleased to issue a **Conditional Interim Certification** for the Terre Kleen™ storm water treatment device by Terre Hill Concrete Products. This Conditional Interim Certification is being issued pursuant to this program's receipt and review of the New Jersey Corporation for Advanced Technology (NJCAT) verification report for the Terre Kleen™ storm water treatment device, dated December 2006.

According to the NJCAT's verification, the Terre Kleen™, Model TK18, at a flow rate of 288 gpm (0.64 ft^3/s), has been shown to have a 78% total suspended solids (TSS) removal efficiency, as measured as suspended solids concentration (SSC) (as per the NJDEP methodology for calculation of treatment efficiency) for a mixture of sand and Sil-Co-Sil 250 with an average d_{50} particle size of 86 microns, an average influent concentration of 228 mg/L and 50% initial sediment loading in laboratory studies using simulated storm water.

Based on the demonstrated and NJCAT verified laboratory performance, NJDEP has confidence that the Terre Kleen™ storm water treatment system has the capability of achieving, in field applications, a TSS removal efficiency of 50%. Therefore, **NJDEP certifies that the Terre Kleen™ Model TK18, is capable of achieving a 50% TSS removal rate while operating at a flow rate not to exceed 288 gpm (0.64 cfs).** In addition, the various models of the Terre Kleen™ storm water treatment system, as presented in **Table 1**, are also approved for use to achieve the same TSS removal efficiency of 50% from storm water runoff, while operating at or below the respective designed treatment flow rates.

Terre Kleen™ Models	Treatment Flow Rate
TK09	143 gpm (0.32 cfs)
TK18	288 gpm (0.64 cfs)
TK27	430 gpm (0.96 cfs)
TK36	575 gpm (1.28 cfs)

Table 1. Additional Terre Kleen™ Models

The enclosed Conditional Interim Certification Findings contains additional conditions to this Interim Certification of the Terre Kleen™ storm water treatment system such as maintenance requirements, designated use, and field-testing requirements. Therefore, this **Interim Certification letter must always be used in conjunction with the enclosed Conditional Interim Certification Findings document**.

Please note that this approval letter shall expire on March 31, 2008, unless extended by the NJDEP. For final certification of the Terre Kleen™ storm water treatment system, verified data must be generated from a full-scale field demonstration utilizing the TARP Tier II Protocol and additional NJDEP field testing requirements. If you have any questions about this Conditional Interim Certification, please contact Ravi Patraju of my staff at (609) 292-0125.

Sincerely,

Martin Rosen
Chief - Bureau of Sustainable Communities
and Innovative Technologies, DSRT

Enclosure

c: Mark Mauriello, Assistant Commissioner, Land Use Management
Larry Baier, Director, Division of Watershed Management
Tom Micai, Director, Land Use Regulation Program
Eileen Murphy, Director, Division of Science, Research, and Technology
Narinder Ahuja, Director, Division of Water Quality
Rhea Brekke, Executive Director, New Jersey Corporation for Advanced Technology

Conditional Interim Certification Findings

NJDEP Technology Certification Program:

Bureau of Sustainable Communities & Innovative Technologies
Division of Science, Research & Technology
401 E State Street, P.O. Box 409
Trenton, NJ 08625
(609) 292-9692

Manufactured Treatment Device:

Terre Kleen™ Storm Water Treatment Device by Terre Hill Concrete Products.

Applicant Information:

Hans De Bruijn
Sales Engineer
Terre Hill Concrete Products
P.O. Box 10
Terre Hill, PA 17581
(717) 445-3100

Technology Description:
A schematic diagram of the Terre Kleen™ as shown in Figure 1 is constructed with inclined cells stacked in the grit chamber to operate in parallel. The primary chamber collects coarse sediment, litter, and oil. Removal of the oil is further enhanced by the use of sorption socks that float in the primary chamber.

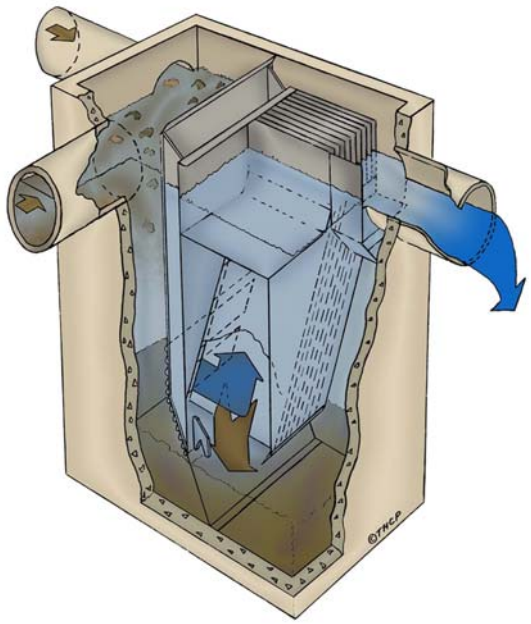

Figure 1. Schematic of the Terre Kleen™

Flow from the primary chamber enters the grit sedimentation chamber at the bottom of the inclined plates where the small particles settle out and accumulate into a separate storage hopper away from the flow path. The unit has inclined plate cells, and the grit chamber below the plates minimizes re-suspension of sediments through successive storms. Figure 2 shows the sectional views of the Terre Kleen™.

If the flow to the device exceeds the design flow, all of the water will be screened to remove gross pollutants. This will be achieved through a screen with ¾-inch openings between the primary and grit chamber. Between the screen and grit chamber is a 6-inch bypass channel over the full width of the device for excess flow to reach the outlet pipe. Bypass provisions are included to provide some treatment for the water entering the device without creating a bottleneck in the system.

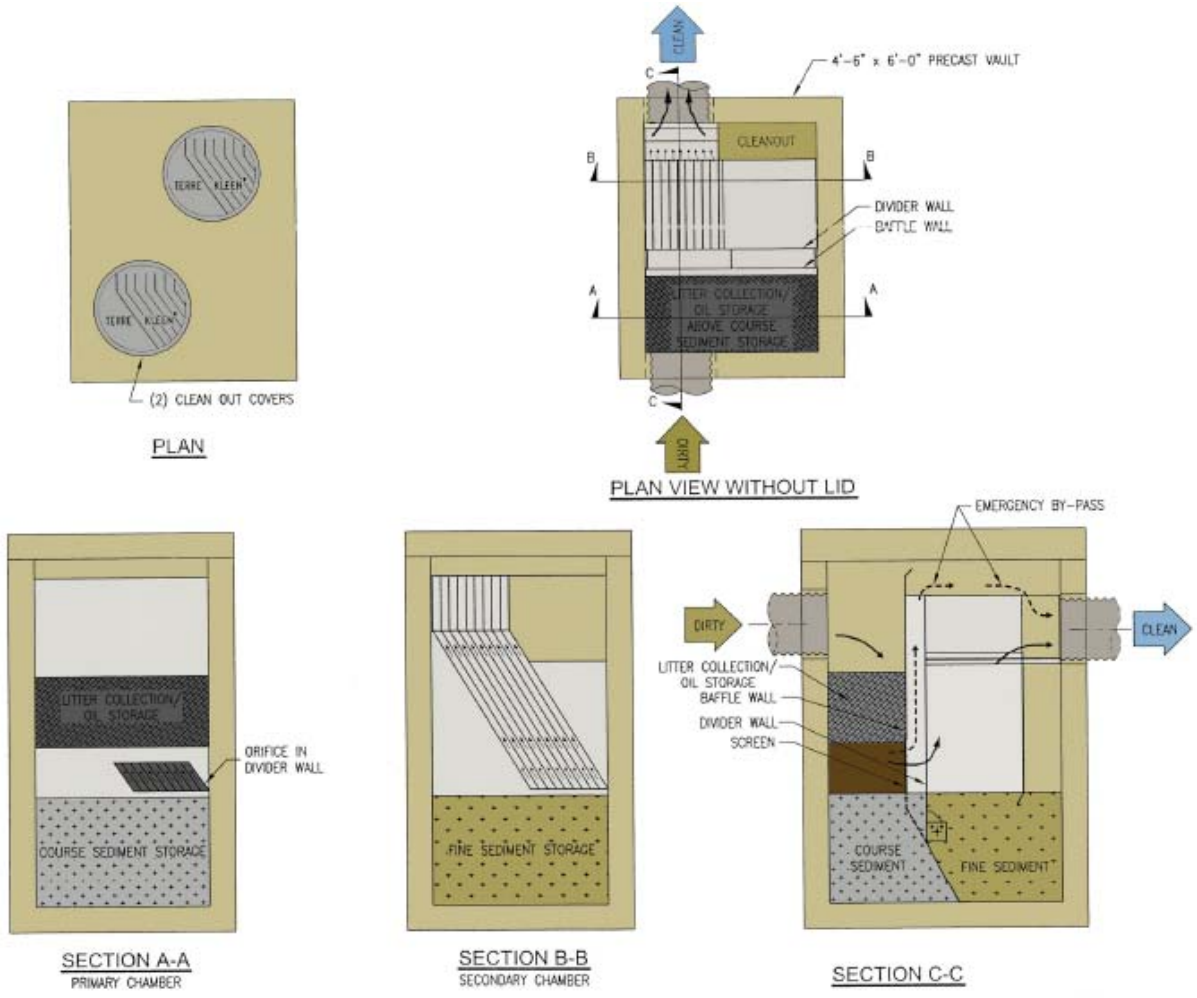

Figure 2. Plan and Section Views of the Terre Kleen™

NJCAT Verified Claim:

"The Terre Kleen™, Model TK18, at a flow rate of 288 gpm (0.64 ft^3/s), has been shown to have a 78% total suspended solids (TSS) removal efficiency, as measured as suspended solids concentration (SSC) (as per the NJDEP methodology for calculation of

treatment efficiency) for a mixture of sand and Sil-Co-Sil 250 with an average d_{50} particle size of 86 microns, an average influent concentration of 228 mg/L and 50% initial sediment loading in laboratory studies using simulated stormwater."

Technology Limitations/Concerns:

- Heavy loads of sediment will increase the needed maintenance frequency. Lack of maintenance may cause the system to operate at a reduced efficiency, and it is possible that eventually the system will become filled with sediment up to the lower edge of the inclined plates thus blocking flow.
- The Terre Kleen™ will not increase the net pollutant load to the downstream environment. However, pollutants may be transformed within the unit. For example, organic matter may decompose and release nitrogen in the form of nitrogen gas or nitrate.
- Although the Terre Kleen™ is a self-contained unit, the design does incorporate standing water in the lower chamber, which can be a breeding site for mosquitoes. The technology has not been tested to identify mosquito related effects.

Maintenance Recommendations

- As recommended in the BMP Manual, the device should be inspected and maintained in accordance with the manufacturer's instructions, and all components of the device that are expected to receive and/or trap debris and sediment must be inspected for clogging and excessive debris and sediment accumulation at least four times annually as well as after every storm exceeding 1 inch of rainfall.
- Disposal of debris, trash, sediment, and other waste material should be done at suitable disposal/recycling sites and in compliance with all applicable local, state, and federal waste regulations.

NJDEP Conditional Interim Certification:

Based on the demonstrated and NJCAT verified laboratory performance, NJDEP has confidence that the Terre Kleen™ storm water treatment system has the capability of achieving, in field applications, a TSS removal efficiency of 50%. Therefore, **NJDEP certifies that the Terre Kleen™ Model TK18, is capable of achieving a 50% TSS removal rate while operating at a flow rate not to exceed 288 gpm (0.64 cfs).** In addition, the various models of the Terre Kleen™ storm water treatment system, as presented in **Table 1**, are also approved for use to achieve the same TSS removal efficiency of 50% from stormwater runoff, while operating at or below the respective designed treatment flow rates.

Terre Kleen™ Models	Treatment Flow Rate
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Table 1. Additional Terre Kleen™ Models

The following conditions shall also apply to the Conditional Interim Certification:

1. If used as part of a treatment train, the Terre Kleen™ storm water treatment system can be located downstream of BMPs that have lower TSS removal ratings, but should never be the last device of the treatment train. Also, use of this device in series with other manufactured treatment devices can only be approved by the Land Use Regulation Program and/or the Division of Watershed Management.
2. The Terre Kleen™ storm water treatment system shall be designed in accordance with New Jersey's water quality design storm, as defined in the Stormwater Management Rules (N.J.A.C. 7:8).
3. A Quality Assurance Project Plan (QAPP) supporting the Technology Acceptance and Reciprocity Partnership (TARP) Tier II Protocol for Stormwater Best Management Practice Demonstration (July, 2003), and New Jersey Tier II Stormwater Test Requirements, shall be submitted to the NJDEP and NJCAT within six (6) months from the date of the Conditional Interim Certification letter.
4. Field evaluation data that are consistent with the TARP Tier II Protocol and New Jersey Tier II Stormwater Test Requirements, which are available from NJCAT or www.state.nj.us/dep/dsr/bscit/Documents.htm, shall be submitted to the NJDEP and NJCAT by September 30, 2008.