86256-1 5/21/2013 1/24

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Pesticide Programs
Antimicrobials Division (7510P)
1200 Pennsylvania Avenue NW
Washington, D.C. 20460

EPA Reg. Number: 86256-1

Date of Issuance: MAY 21 2013

Term of Issuance: **Time Limited: Expires on May 31, 2014**

Name of Pesticide Product: **Smart Sponge® Plus**

NOTICE OF PESTICIDE:
x Registration
___ Reregistration

(under FIFRA, as amended)

Name and Address of Registrant (include ZIP Code):

AbTech Industries, Inc.
4110 N. Scottsdale Rd. Suite 235
Scottsdale, AZ 85251

Note: Changes in labeling differing in substance from that accepted in connection with this registration must be submitted to and accepted by the Registration Division prior to use of the label in commerce. In any correspondence on this product always refer to the above EPA registration number.

On the basis of information furnished by the registrant, the above named pesticide is hereby registered/reregistered under the Federal Insecticide, Fungicide and Rodenticide Act.

Registration is in no way to be construed as an endorsement or recommendation of this product by the Agency. In order to protect health and the environment, the Administrator, on his motion, may at any time suspend or cancel the registration of a pesticide in accordance with the Act. The acceptance of any name in connection with the registration of a product under this Act is not to be construed as giving the registrant a right to exclusive use of the name or to its use if it has been covered by others.

This product is conditionally registered in accordance with FIFRA sec 3(c)(7)(B) provided that:

1. The following two studies listed below are received by the Agency, reviewed and found to be acceptable in order to fulfill the conditions of this Registration:

a. Acute freshwater fish study OPPTS Guideline 850.1075 (TGAI)
b. Acute freshwater aquatic invertebrate study OPPTS Guideline 850.1010 (TGAI)

Signature of Approving Official:

Velma Noble
Product Manager Team-31
Regulatory Management Branch I
Antimicrobials Division (7510P)

Date: MAY 21 2013

EPA Form 8570-6

2. This data must be conducted in accordance with established protocols and submitted to the Agency for review by January 31, 2012.

3. Submit and/or cite all data required for registration/reregistration of your product under FIFRA sec. 3(c)(5) when the Agency requires all registrants of similar products to submit such data; and submit acceptable responses required for re-registration of your product under FIFRA section 4.

4. If these conditions including the labeling changes which follow are not complied with, this Registration will be subject to cancellation in accordance with FIFRA section 6 (e).

5. Your release for shipment of this product constitutes acceptance of these conditions.

6. Make the labeling changes listed below before you release the product for shipment:

a. Revise the EPA Registration Number to read, "EPA Reg. No. 86256-1".

b. Delete the following statement on the front panel: "See back panel booklet for additional Precautionary Statements." This statement does not appear to coincide with any precautionary language.

c. Add the following sentence as the second statement immediately following the heading "Directions for Use": "**Do not use for treatment of potable and/or drinking water.**"

d. Revise page two by deleting the reference to the "pretreatment of water for membrane systems" listed in item #2 of the directions for use. It is unclear as to why water which should be clean would be pretreated with this product.

e. All claims of effectiveness for this product are limited to "coliform reduction" based on the submitted data. Beginning on page three and continuing throughout the label and attachment A revise all references to total coliform bacteria and the effectiveness of this product to indicate "coliform reduction," "reduction of coliform bacteria," "reducing coliform bacteria," "reduce coliform bacteria," or "provides coliform reduction" only. Delete all references to "total coliform bacteria", as a total coliform reduction claim implies 100% reduction. Such a claim is not supported by the submitted data. This revision to a "coliform reduction" claim will bring this product into agreement with other similar products in the marketplace.

f. In order to bring this label into agreement with the human health assessment, add the following statement to the Inspection and Maintenance section on page four: "*Gloves should be worn during all inspection, maintenance and replacement activities.*"

g. Delete the following statements from page six which are not accurate: "Smart Sponge Plus is the first product registered by the EPA for the [treatment/reduction] of total coliform bacteria in stormwater." and "Under a controlled set of parameters, Smart Sponge Plus offers reproducible antimicrobial performance results through engineered field solutions."

h. Should you wish to retain a reference to the company's website on your label then please be aware that such a reference transforms the website into labeling under the Federal Insecticide Fungicide and Rodenticide Act sec 2 (p) (2) and then the website is subject to review by the Agency. If the website content is false or misleading, the product would be misbranded and its sale or distribution unlawful to sell or distribute under FIFRA section 12(a)(1)(E). In addition, regardless of whether a website is referenced on your product's label, claims made on the website may not substantially differ from those claims approved through the registration process. Although EPA has not yet determined the extent to which it will routinely review company websites, if the Agency finds or if it is brought to our attention that a website contains false or misleading statements or claims substantially differing from claims approved through the registration process, the website may be referred to the EPA's Office of Enforcement and Compliance Assurance.

i. Correct the diagram on in attachment A, picture 1 to state: "Chemical and bio-treatment (oil & grease, *coliform* bacteria *reduction*)."

j. Revise attachment A, section IV. **Installation** to include the following revised statements: "...This manual does not claim to cover or implicitly address all safety, compliance, or regulatory issues related with the manufacturing and/or fabrication of the concrete products or of the internal components used within the Smart Pak® Vault, *excluding the Smart Sponge® Plus.* It is the on-site user's responsibility to establish the appropriate safety, health, environmental practices, and regulatory requirements to meet federal, state, and local mandated standards in relation to the concrete products or internal components, *that have not been supplied by AbTech.* Deviation from regulatory..."

k. Revise the Hydraulic Performance chart on page three by adding the following clarifying information immediately below the chart: "*The amount of Smart Sponge Plus needed to treat 1 cubic foot/second (CFS) of contaminated water is approximately 256 cubic feet. To treat 5 CFS of contaminated water, 1216 cubic feet of Smart Sponge Plus material is needed. These quantities assume an average of 4 feet available hydraulic head.*"

7. Upon completion, submit a one year Storage Stability and Corrosion Characteristics Study to the Agency for review.

A stamped copy of the label is enclosed for your records. Submit one (1) copy of your final printed labeling prior to release of this product for shipment. If you have any questions concerning this letter, please contact Velma Noble at 703 308 6233.

Sincerely,

Velma Noble
Product Manager 31
Regulatory Branch I
Antimicrobials Division (7510P)

Enclosure: (Stamped Label)

5/24

Smart Sponge® Plus

[***ABN***: Ultra-Urban® Filter with Smart Sponge® Plus]
[***ABN***: Smart Pak® with Smart Sponge® Plus
[***ABN***: Smart Sponge® Plus Popcorn filtration media]
[***ABN***: Smart Pak® Vault with Smart Sponge® Plus]

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in EPA Letter Dated:
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THIS PRODUCT CONTAINS:
ACTIVE INGREDIENT:
3-(trimethoxysilyl) propyldimethyloctadecyl ammonium chloride ..... 4.5 %

OTHER INGREDIENTS: 95.5%
TOTAL 100.00%

KEEP OUT OF REACH OF CHILDREN
CAUTION
[redacted]

NET WT: Various

EPA Reg. No. 86256-

6/24

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

For Stormwater, Industrial Wastewater and Municipal Wastewater Treatment Only

Smart Sponge® Plus is installed as an independent filtration media or incorporated into manufactured products for the following applications:

1. Underground, single pass, storm water filtration systems including catch basin inserts, filtration beds, filtration units, cartridges, and filtration layers.
2. Industrial wastewater filtration systems: including cartridges, vessels for batch or continuous operation, and filtration panels for treatment of industrial discharges, process water and [redacted], excluding drinking and potable water.
   [Note to reviewer: Process wastewater defined as water that comes in contact with any raw material, product, by-product, or waste during any production or industrial process. (Source businessdirectionary.com)]
3. Municipal wastewater filtration: systems for treatment of secondary or tertiary municipal sewage treated effluent, excluding drinking and potable water. SmartSponge Plus must not be used as stand alone treatment of raw sewage.

The sizing and installation directions for Smart Sponge® Plus products will vary according to specific site characteristics. The size and structural integrity of each site, the water flow rate and bacterial concentration are all factors to be considered in determining which physical form of the product should be selected. The Smart Sponge® media is deployed in multiple physical forms, i.e. Popcorn (small clumps of Smart Sponge® Plus material similar in shape to popcorn), Smart Paks® (brick-shaped blocks of Smart Sponge® Plus material) or a combination of the two. In each case, the Smart Sponge® media is contained or packaged in netting, fabric or screens to avoid any release of loose material.

Design engineers will work with each customer to design the proper size and shape of the Smart Sponge® Plus system for each installation, and field technicians will provide technical assistance during the installation and operation of the Smart Sponge® Plus filtration system. The basis for the design is described in the table below:

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Hydraulic Performance Rating of Smart Sponge® Plus: Flow rate per square foot of Frontal Area for the stated Bed Depth and Available Hydraulic Head.

Bed Depth of Smart Sponge® Plus	1 Foot of Hydraulic Head	2 Feet of Hydraulic Head	3 Feet of Hydraulic Head	4 Feet of Hydraulic Head
2 Feet	15 GPM[1]/SQ. FT.[2]	33 GPM/SQ. FT.	50 GPM/SQ. FT.	67 GPM/SQ. FT.
4 Feet	7 GPM/SQ. FT.	19 GPM/SQ. FT.	30 GPM/SQ. FT.	41 GPM/SQ. FT.
6 Feet	2.5 GPM/SQ. FT.	10 GPM/SQ. FT.	18 GPM/SQ. FT.	26 GPM/SQ. FT.
8 Feet	0 GPM/SQ. FT.	4 GPM/SQ. FT.	10 GPM/SQ. FT.	15 GPM/SQ. FT.

Smart Sponge® Plus density (19 +/- 2 lbs/cf), Al 4.5% by weight
[1]GPM = Gallons per Minute
[2]Sq.Ft. = Square Feet of Frontal Surface

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Sizing and Installation

The Smart Sponge® Plus filtration systems are designed in multiple configurations. Products incorporating the Smart Sponge® Plus technology do not typically require structural changes to stormwater systems. Products such as the Ultra-Urban® Filter with the Smart Sponge® Plus technology fit into most existing catch basins.

The Ultra-Urban® Filter with Smart Sponge® Plus comes in two standard designs, 1) a modular unit geared toward curb inlet openings or 2) a single unit designed for typical drop-in catch basins.

Vault systems using Smart Sponge® Plus are installed at the middle or end of a drainage or sewer pipe and are either large cast-in-place vaults with cages of Smart Sponge® Plus material, or small, compact, precast vaults with multiple Smart Pak® blocks installed to achieve the desired filtration bed length. Cast-in-place underground units are customized for larger flows. The various filtration systems are designed to filter the water discharge flow of a two-year, 24-hour design storm and reduce [redacted] coliform bacteria contamination in the water runoff.

AbTech Industries technicians or trained engineers determine each filtration system's discharge flow from calculations based on the contributing watershed. Designers also determine the site [redacted] coliform bacterial contamination using historical baseline data obtained from runoff sampling.

Smart Sponge® Plus filtration systems are appropriately sized based on the water quality treatment flow rate and [redacted] coliform bacterial contamination data. As most contamination is contained in the initial runoff (first flush), the Smart Sponge® Plus

8/24

system is not sized to treat peak discharge from the watershed and will incorporate an internal bypass to handle peak discharge.

Smart Sponge® Plus material is used for industrial wastewater filtration. Typical deployments for industrial applications involve filtration cartridges and vessels, where the Smart Sponge® Plus media is housed in prefabricated housings. The design and sizing of these filtration systems is based on the hydraulics and pollutant data for the site as well as operating and/or discharge requirements.

Municipal wastewater treatment applications use filtration beds of the Smart Sponge® Plus material installed after secondary treatment systems for the abatement of residual [redacted] coliform bacterial concentration. The filtration systems are designed to handle operating flow rates and reduce total coliform bacterial concentration to allow discharge in compliance with existing regulations.

AbTech Industries provides the user with customized installation instructions in order to allow Smart Sponge® Plus filtration systems to effectively perform their filtration function. Non compliance with installation instructions will void all product warranties.

Inspection and Maintenance

A plan for regularly scheduled inspections must be established for each installation of Smart Sponge® Plus systems. The maintenance schedule for each installation may vary based on watershed conditions (see Operation and Maintenance Manual, Attachment A).

Smart Sponge® Plus filtration systems will collect trash, debris, and sediment over the course of the deployment. To maintain the antimicrobial performance each Smart Sponge® Plus system must be inspected for hydraulic performance on a regular basis. In addition, each system must be cleaned at least once per year, or more frequently if visual inspection shows visible trash, debris, or sediment (please refer to Operation and Maintenance Manual, Attachment A).

Inspections must occur:

- Quarterly during the calendar year;
- After major storms.

In vault applications, visual inspection must include observation for settled trash and debris on the vault floor, standing water, and any other abnormalities. In addition, the stainless steel structure must be inspected for damage or deterioration. Any debris, vegetation, or trash must be removed.

Major maintenance, must be completed if determined necessary following inspections of Smart Sponge® Plus filtration systems. Major maintenance includes such steps as

cleaning (vacuuming trash and debris), hydraulic testing, sediment removal, and rotation/replacement of the Smart Sponge® Plus material.

Due to the absence, or limited presence, of sediment and coarse contaminants in industrial and municipal wastewater treatment applications, a visual inspection must be performed every month to verify the structural integrity of the filtration system and its required operational hydraulic performance.

A complete description of the inspection and maintenance process is found in the *Smart Pak® Vault with Smart Sponge® Plus Operation and Maintenance Manual* accompanying this label [Attachment A].

Non compliance with proper inspection and maintenance instructions will void product warranties.

Replacement

The Smart Sponge® Plus filtration systems maintain their antimicrobial efficacy over the life of the product, but efficacy is affected by physical factors such as sediment coating, oil absorption, trash accumulation, and general oxidation.

To maintain efficacy, the maintenance program must be implemented throughout the life of the Smart Sponge® Plus filtration system. Required maintenance activities include hydraulic conductivity testing and rotation of the Smart Sponge® Plus material within the filtration structure (i.e., rotate the front layer of Smart Sponge® Plus material to the back of the filtration system) every 3 to 6 months. Details on hydraulic testing and filtration media rotation are found in the Smart Pak® Vault with Smart Sponge® Plus Operation and Maintenance Manual accompanying this product [see Operation and Maintenance Manual, Attachment A]. If the hydraulic conductivity test mentioned above fails, the antimicrobial efficacy of the filtration system may be compromised and the Smart Sponge® Plus material within the system must be replaced.

Compliance with the required maintenance schedule and rotation protocol will allow the Smart Sponge® Plus filtration system to be effective up to 3 years depending on site characteristics.

PESTICIDE STORAGE AND DISPOSAL

Do not contaminate food or feed by improper storage and disposal.

Pesticide Storage: Always store pesticides in the original container. Store in a dry area with ambient temperature below 95°F (35°C). When in storage, avoid extended or frequent exposure to direct natural or artificial light. Clean up any spills promptly.

Pesticide Disposal: Upon removal of the used Smart Sponge® Plus system, dispose

of the Smart Sponge® Plus material at an approved waste disposal facility. The following waste disposal and resource recovery industries have accepted spent Smart Sponge® products for disposal and/or recycling - waste-to-energy facilities, cement kilns and landfills.

Container Disposal: Non-refillable container. Do not reuse or refill this container. Completely empty container. Then offer for recycling if available or dispose of in a sanitary landfill or, if allowed by state and local authorities, by incineration or burning. If burned, stay out of smoke.
[Note to reviewer: Shipping containers include cardboard boxes, plastic drums, fiber drums and palletized product secured with shrink wrapping film.]

CLAIMS
[Note to reviewer: These claims may be presented on the container label or on the labeling accompanying the product.]

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WITH COMMENTS
In EPA Letter Dated:
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~~Smart Sponge® Plus is the first product registered by the EPA for the Reduction of~~ [reduction] of total coliform bacteria in stormwater.

Smart Sponge® Plus reduces [redacted] coliform bacteria found in stormwater, industrial wastewater and municipal wastewater .

Smart Sponge® Plus is an antimicrobial product that reduces [redacted] coliform bacteria found in stormwater, industrial wastewater and municipal wastewater .

Smart Sponge® Plus contains an antimicrobial agent that is effective in reducing [redacted] coliform bacteria found in stormwater, industrial wastewater and municipal wastewater .

Smart Sponge® Plus has antimicrobial capabilities that make it effective as a filtration media to reduce [redacted] coliform bacteria found in stormwater, industrial wastewater and municipal wastewater .

Smart Sponge® Plus offers engineered [field] solutions for reducing [redacted] coliform bacteria in stormwater.

Smart Sponge® Plus offers engineered field solutions for reducing [redacted] coliform bacteria in stormwater, industrial wastewater and municipal wastewater.

Smart Sponge® Plus can be engineered using controlled test parameters (such as modifying flow rates and [redacted] coliform bacterial concentration) to meet your performance requirements.

~~Under a controlled set of parameters, Smart Sponge® Plus offers reproducible antimicrobial performance results through engineered field solutions.~~

Smart Sponge® Plus is designed to assist water systems to meet Total Maximum Daily Load Limits (TMDL's) for [redacted] coliform bacteria.

When properly installed and maintained, Smart Sponge® Plus provides a significant reduction in [redacted] coliform bacteria.

Notice: To the extent consistent with applicable law, buyer assumes all responsibility for safety and use not in accordance with directions. OSHA regulations need to be followed in order to prevent work-related injuries.

Manufactured By:
AbTech Industries, Inc.
4110 N. Scottsdale Road, Suite 235
Scottsdale, AZ 85251

Made in USA

Questions, Comments or Medical Information
Call 1-800-545-8999 www.abtechindustries.com
Rodolfo B. Manzone, PhD, Chief Technology Officer

EPA Reg. No. 86256-

EPA Est. No. 086256-AZ-001

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12/24

Attachment A

Smart Pak® Vault with Smart Sponge® Plus

Operation and Maintenance Manual

April 28, 2010

I. **Description**

II. **Purpose**

III. **Sizing**

IV. **Installation**

V. **Inspection and Maintenance**

Inspection
- Frequency
- Items to inspect
- Inspection Documentation

Maintenance
- Guidelines
- Type of Maintenance
  - Hydraulic Testing
  - Filtration Media Rotation and replacement
- Frequency
- Maintenance Documentation

Inspection and Maintenance Checklists
- Smart Pak® Vault with Smart Sponge® Plus Inspection Data Sheet
- Smart Pak® Vault with Smart Sponge® Plus Maintenance Report

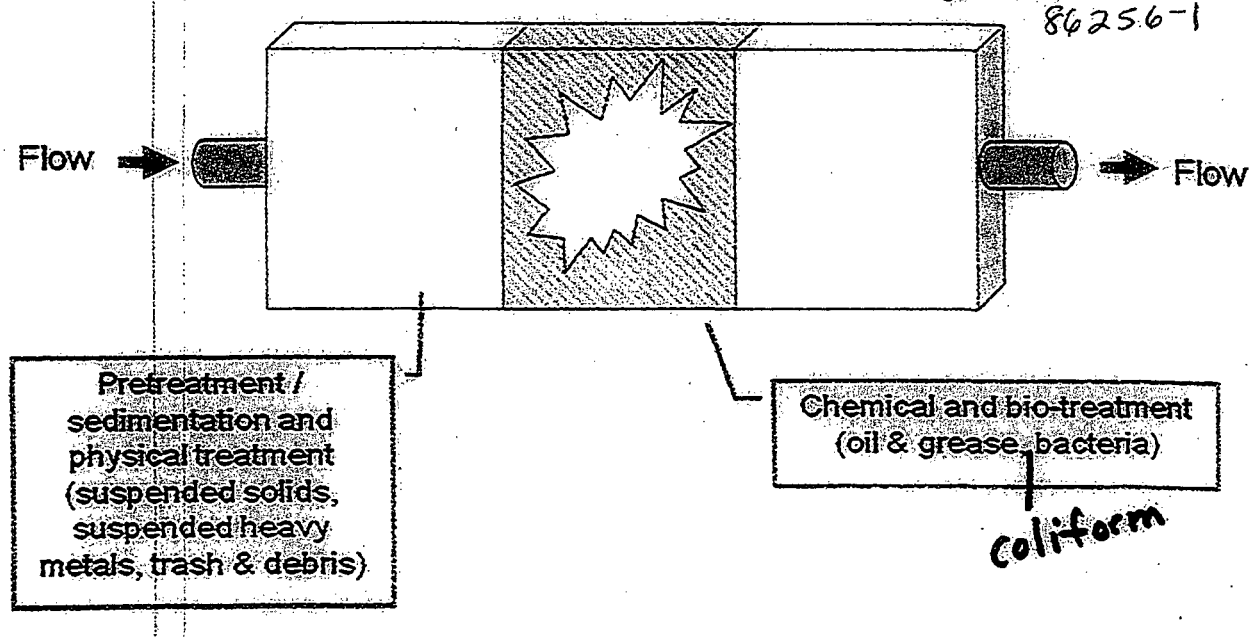
VI. **Material Disposal**

I. Description

The Smart Pak® Vault with Smart Sponge® Plus is a passive, flow-through, stormwater filtration system. The system is comprised of an underground concrete vault that houses Smart Sponge® filtration media contained within a filtration structure. The Smart Sponge® media can be deployed in multiple physical forms, i.e. Popcorn, Smart Pak® or a combination of the two. The Smart Pak® Vault with Smart Sponge® Plus works by flowing stormwater through the media section, which removes suspended solids, including some suspended heavy metals, absorbs oil and grease as well most hydrocarbons and reduces ~~fecal~~ coliform bacteria count (see picture 1 below). Once filtered through the media, the treated stormwater is directed to a collection pipe or discharged into an open channel drainage way.

The filtration system for Smart Pak® Vault with Smart Sponge® Plus is designed in multiple configurations, typically direct flow or radial flow. The housing of the filtration system utilizes pre-manufactured units to ease the design and installation processes. Cast-in-place underground units are customized for larger flows.

Smart Pak® Vault with Smart Sponge® Plus



Picture 1

II. Purpose

The Smart Pak® Vault with Smart Sponge® Plus is a passive stormwater filtration system designed to improve the quality of stormwater runoff from the urban environment before it enters receiving waterways.

The Smart Pak® Vault with Smart Sponge® Plus has been shown, in independent third party studies, to be highly effective for treatment of first flush and design storm events, while allowing easy bypass of peak flow. In general, the efficacy is highest when pollutant concentrations are highest. The primary non-point source pollutants targeted for removal or reduction by the Smart Pak® Vault with Smart Sponge® Plus are: trash and debris, suspended solids (TSS) including insoluble metals and nutrients attached to sediment, oil, grease and ~~total~~ coliform bacteria.

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III. Sizing

The Smart Pak® Vault with Smart Sponge® Plus filtration bed is typically designed to filter the water discharge flow of a two-year, 24-hour design storm and reduce contamination in the runoff. The discharge flow is determined from calculations based on the contributing watershed, and the site contamination is determined using historical baseline data obtained from runoff sampling. As most contamination is contained in the initial runoff (first flush), the Smart Pak® Vault with Smart Sponge® Plus system is designed to treat first flush but not sized to treat peak discharge from the watershed and will incorporate internal bypass to handle peak discharge.

IV. Installation

Smart Pak® Vault with Smart Sponge® Plus filtration bed installation instructions are supplied by AbTech Industries, Inc. and its authorized distributors for each site and must be carefully followed. This manual does not claim to cover or implicitly address all safety, compliance, or regulatory issues related with the manufacturing and/or fabrication of the concrete products or of the internal components used within the Smart Pak® Vault [redacted]. It is the on-site user's responsibility to establish the appropriate safety, health, environmental practices, and regulatory requirements to meet federal, state, and local mandated standards in relation to the concrete products or internal components. Deviation from regulatory requirements at any level is borne by the on-site user and AbTech Industries, Inc. is not responsible for any failure to comply.

Installation instructions contained within this label are intended to guide on-site installation personal to comply with federal, state, and local requirements for the Smart Pak® Vault with the Smart Sponge® Plus.

Manufacturing of concrete vaults, either cast-in-place or modular precast units, must adhere to the specifications set by the American Concrete Institute (ACI), ASTM International, American Association of State Highway and Transportation Officials (AASHTO), American Welding Society (AWS), and all state and local requirements. Installation and confined space entry within concrete vaults must follow applicable safety regulations set by the Occupational Safety and Health Administration (OSHA).

Fabrication of non-corrosive metal units containing Smart Sponge media, i.e. flat bar steel, angle steel, expanded metal, filler material for welds, fastening components, reinforcing components, etc, must adhere to the industry practices enforced by ASTM International and AWS. This manual does not exclude any materials or techniques that would help achieve the goal of providing structurally sound, high quality products that meet industry standards.

Prior to fabrication or installation of any vault structures or vault components, consult the governing regulatory requirements set at either the federal, state, or local level.

V. Inspection and Maintenance

Inspection

➢ ***Frequency***

Inspection scheduling is site specific as it needs to take into account local weather pattern, site/watershed profile and contaminants loading. Inspections must be conducted at least as often as:

- Quarterly during the calendar year;
- After major storms.

➢ ***Items for inspection***

The goal of the inspection is to assess the accumulation of any trash, debris, or particulate matter in the inlet trough and assess the viability of the filtration media to convey water and/or to [redacted] coliform bacteria.

Always employ proper traffic management and handling procedures for all inspections where vehicles and pedestrians have access.

Remove manhole/ lid(s) and observe from above:

1. The inlet trough for settled trash and debris on the floor.
2. The inlet trough for standing water.
3. The inlet trough for the high water line.
4. The outlet trough for abnormalities.
5. Stainless steel (SS) structure for damage or deterioration.

6. Replace manhole/ lid(s) as appropriate.

If unable to observe details of the media or SS structure, enter the vault.
Do not enter the vault during periods of rain or when the system is actively working (releasing of upstream, detained stormwater through the unit). Always employ OSHA regulated rules for confined space when working inside the vault.

Inspect:

1. Anything not observable from above (see previous list).
2. The inlet grid and inlet face of the media for "fouled" media due to the clogging of pores from trash or other particulate matter (the outside surface of the media may be a brown color or otherwise obviously clogged with particulate matter).
3. The inlet face of the media for "fouled" media due to the absorption of hydrocarbons (the outside surface of the media will be a black color).
4. Other devices located within Smart Pak® Vault with Smart Sponge® Plus as appropriate (e.g.: non-stormwater bypass lines, motor operated valves, etc.). See Inspection and Maintenance Procedures for other devices.
5. Replace manhole/ lid(s) as appropriate.

➢ ***Inspection Documentation***

Complete the Smart Pak® Vault with Smart Sponge® Plus Inspection and Maintenance Report. This report will assist in the decision process to initiate appropriate maintenance activities.

Maintenance

➢ ***Guidelines***

The primary purpose of the Smart Pak® Vault with Smart Sponge® Plus, like any effective filtration system, is to filter out and prevent pollutants from entering our waterways. Accordingly, the pollutants being captured by the Smart Pak® Vault with Smart Sponge® Plus must be periodically removed. The goal of the maintenance activities is not only to repair or extend the functionality of the filtration media, but also to prevent malfunctions of the media before they occur. As previously noted, trash, debris, and other particulate matter are detrimental to the proper function of the media; therefore, maintenance activities focus primarily on these types of contaminants.

Maintenance requirements and frequency are dependent on the pollutant load characteristics of each site.

Maintenance activities are required in the event of a chemical spill or due to excessive sediment loading from site erosion or extreme storms. It is also good practice to inspect the system after severe storm events.

➢ ***Types of Maintenance***

Currently, two types of maintenance have been defined:

- Ordinary/minor maintenance
- Major maintenance

Ordinary maintenance activities are often combined with inspection since minor maintenance does not require special equipment and typically little or no materials are in need of disposal.

Ordinary/minor maintenance involves:

- Inspection of the installation itself
- Removal of vegetation, trash and debris and sediment

Major maintenance includes:

- Sediment removal
- Filtration media (Smart Pak® or Popcorn) cleaning/hydraulic testing (once a year)
- Filtration media rotation and/or replacement

Important: Applicable safety (OSHA) and disposal regulations must be followed during all maintenance activities.

Four scheduled inspections/maintenance activities must take place during the year.

First, an inspection/minor maintenance activity must be done. During the minor maintenance activity (routine inspection, debris removal), the need for major maintenance should be determined and, if disposal during major maintenance will be required, samples of the sediment and media must be obtained.

Second, if required, a major maintenance activity (replacement of the filter media and associated sediment removal) must be performed. Major maintenance is also required if, from visual inspection, the integrity of the Smart Pak® blocks is damaged.

In addition to these two scheduled activities, the condition of the Smart Sponge® unit must be checked after major storms for damage caused by high flows and for high sediment accumulation that may be caused by localized erosion in the drainage area. The maintenance activity schedule must be adjusted when unusual depending conditions are encountered by the system.

Minor maintenance activities will occur late in the rainy season, and major maintenance will occur in late summer to early fall when flows into the system are not likely to be present.

HYDRAULIC TESTING

As identified earlier, the objective of the Smart Pak® Vault with Smart Sponge® Plus is to filter out contaminants from high speed stormwater runoff. The primary as well as ongoing effect of the Smart Pak® Vault with Smart Sponge® Plus bed will be accumulation of sediment in front of the filter bed and on the Smart Pak® block's polymer components, causing a reduction of the hydraulic conductivity of the Smart Pak®. At least once a year and preferably during a major maintenance event, a hydraulic conductivity test of the Smart Pak® must be carried out. Due to flow patterns, it is expected that the Smart Pak's® front layers will be more heavily impacted by sediment accumulation and coating.
When inspecting the Smart Pak® Vault with Smart Sponge® Plus filtration structure, the operator must have the following materials on hand and follow the testing procedure described below:

List of Materials:

1. Hydrotest Device (HD) (Appendix C. Picture 2)
2. Two buckets marked at 5 gallons
3. Chronometer or watch with second hand
4. Disposal container in compliance with local regulations for the contaminants
5. Rubber gloves
6. Hand towel
7. Duct tape and scissors

Testing procedure:

1. Remove the outer sediment coating and verify the overall integrity of the Smart Paks®.
2. Remove a couple of Smart Paks® from the first layer
3. Position two (2) individual Smart Paks® into the Hydrotest Device (HD) paying particular attention to maintain the overall integrity of the Smart Paks® (if crumbling, discard).
4. Verify that the Smart Paks® sit properly into the HD and ensure that all sides of the Smart Pak® are pressed against the HD walls and do not leave any space for water bypass.
5. Wet the entire surface of Smart Paks® with tap water to ensure uniformity in testing and let it drain for one to two minutes (do not collect for measurement).
6. Position the plastic container (with 5 gallons mark) underneath the HD for collecting the test water.
7. Fill a 5-gallon container with tap water; pour it over the Smart Pak® bed and measure the time elapsed from the start of the pour-through until the 5 gallons have been collected in the plastic container below the filtration bed.
8. Repeat steps 7 and 8 at least 3 times and calculate the average.
9. If collecting time is:
   (a) below 30 seconds, the Smart Pak® with Smart Sponge® Plus bed from that point on is still operating within its design.
   (b) above 30 seconds, the Smart Pak® Vault with Smart Sponge® Plus layer tested needs to be replaced.

10. If the first layer fails and needs to be replaced, continue testing and replacing consecutively until a layer with a testing time below 30 seconds is reached.

FILTRATION MEDIA ROTATION AND REPLACEMENT

In order to maximize the lifecycle for the Smart Pak® Vault with Smart Sponge® Plus, media rotation must be added to any major maintenance event. The antimicrobial performance of the Smart Sponge® Plus is tied to the sediment coating and hydrocarbon absorption of the Smart Pak®s. Therefore, the Hydraulic Test is a measure of the residual antimicrobial efficacy. If the Hydraulic Conductivity Test mentioned above fails, the antimicrobial efficacy of the filtration system may be compromised and the Smart Sponge® Plus material within the system must be replaced.

After performing the Hydraulic Test and assessing the need for replacement of the front layer of the Smart Pak® Vault with Smart Sponge® Plus, the back one-third layer of the Smart Pak® Vault with Smart Sponge® Plus must be moved to the front, the front moved to the middle, and the middle to the back.

➢ ***Frequency***

The primary factors for controlling timing of maintenance for the Smart Pak® Vault with Smart Sponge® Plus are sediment accumulation and media fouling/saturation.

A properly functioning system will remove solids from water by trapping particulates in the porous structure of the filter media. The flow through the system will naturally decrease as more and more solids are trapped. Eventually the flow through the system will be low enough to require replacement of the Smart Pak®. It may be possible to extend the usable span of the Smart Pak® components by removing sediment from upstream trapping devices on an as-needed basis in order to prevent material from being re-suspended and discharged to the system.

Site conditions greatly influence maintenance requirements. Smart Pak® Vault with Smart Sponge® Plus units located in areas with erosion or active construction must be inspected and maintained more often than those in fully stabilized areas.

The maintenance frequency may be adjusted as additional monitoring information becomes available during the inspection program. Areas that develop known problems should be inspected more frequently than areas that demonstrate no problems, particularly after large storms.

Ultimately, inspection and maintenance activities must be scheduled based on the historic records and characteristics of an individual Smart Pak® Vault with Smart Sponge® Plus system. The maintenance entity must develop a database to properly manage Smart Sponge® installations.

Prior to the development of the maintenance database, the following maintenance frequencies must be followed:

- Minor maintenance
  - One time per year
  - After major storms
- Major maintenance
  - One time per year
  - In the event of a chemical spill

Maintenance frequencies must be updated as required. Sediment removal is required on an annual basis until sufficient information is obtained about a particular system to justify a different replacement schedule.

Once an understanding of site characteristics has been established, a specific maintenance schedule must be developed

➢ ***Maintenance Documentation***

Complete the Smart Pak® Vault with Smart Sponge® Plus Inspection and Maintenance Report. This report will assist in the decision process to initiate appropriate maintenance activities.

Inspection and Maintenance Checklists

As it is well known in the regulatory environment, properly inspecting and maintaining treatment devices may not always be enough. The facility owner is required to document the Inspection and Maintenance Process and retain inspection and maintenance records for any treatment device employed for the facility.

An important part of the record keeping is the development of an inspection and maintenance database. For the ease of review and demonstration, a *Maintenance Report* and *Inspection and Data Sheet* (refer to Appendix A and B) that summarize all inspection and maintenance activities should be developed.

VI. Material Disposal

As local conditions, product use, and exposure can vary widely, the end-user must determine the most appropriate disposal method for items removed and collected from the Smart Pak® Vault with Smart Sponge® Plus unit.

Collected sediments and water must be disposed of in accordance with applicable regulations. In some cases, the appropriate landfill facilities and/or liquid disposal facilities will have to be employed to properly dispose of solid or liquid wastes.

Dispose of collected, used Smart Sponge filtration media used in standard stormwater

applications at an approved waste disposal facility. The following waste disposal and resource recovery industries have accepted spent Smart Sponge® products for disposal and/or recycling - waste-to-energy facilities, cement kilns and landfills.

ACCEPTED
with COMMENTS
in EPA Letter Dated:
MAY 21 2013
Under the Federal Insecticide, Fungicide, and Rodenticide Act as amended, for the pesticide registered under EPA Reg. No.
86256-1

Appendix A

SMART PAK® Vault with Smart Sponge® Pics Inspection Data Sheet

Date:_____ Personnel: _____

Location:_____ System:_____

System Type:

No.	Inspection Item	
1	Is settled trash, debris, and/or sediment in the inlet trough area?	YES ☐ NO ☐
2	Is water trapped in the inlet trough or is there evidence of the high water mark above the water level difference (WLD) barrier?	YES ☐ NO ☐
3	Is the outlet trough clean and free of abnormalities?	YES ☐ NO ☐
4	Is the stainless steel structure damaged or deteriorated, or is there evidence of leaky joints?	YES ☐ NO ☐
5	Is the inlet grid or the inlet face of the media clogged with trash or other particulate matter?	YES ☐ NO ☐
6	Is the inlet face of the media a black color due to hydrocarbon absorption?	YES ☐ NO ☐
7	Are other devices within the vault functioning properly?	YES ☐ NO ☐
8	Are there any obvious, above ground sources of contamination entering the system?	YES ☐ NO ☐

Appendix B

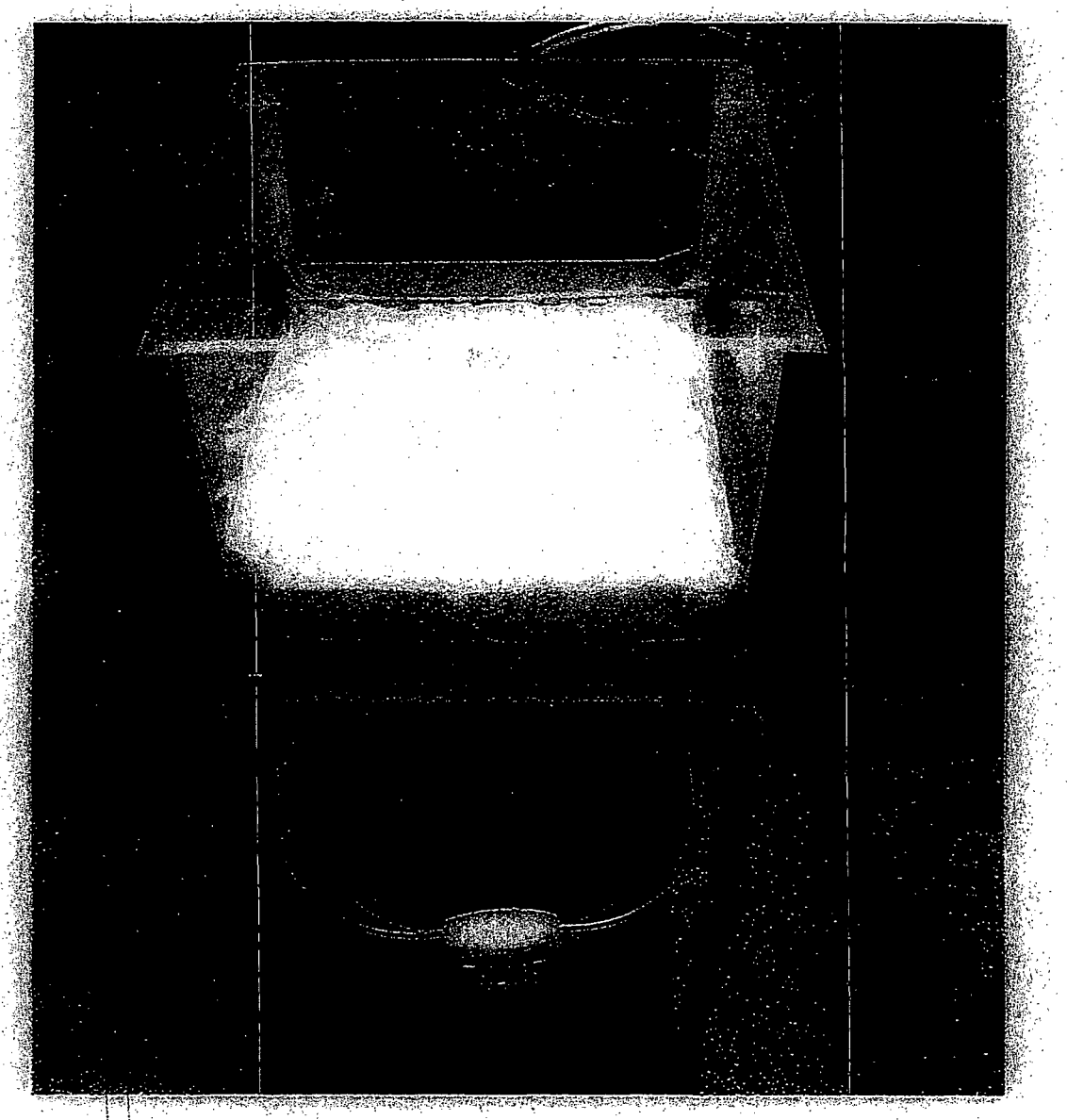
SMART PAK® Vault with Smart Sponge® Plus Maintenance Report

No.	Maintenance Activity	Date Done
1	Collect and remove trash, debris, etc.	
2	Remove water as required.	
3	Clean up outlet trough, and inspect for sources of abnormalities.	
4	Repair or replace damaged or deteriorated structural components. Reseal joints.	
5	Remove obstructions from the inlet grid.	
6	Perform hydraulic test using Hydrotest Device.	
7	Remove the contaminated media and replace with new media. Rotate the media as needed.	
8	Conduct O&M procedures as needed for the other devices. Repair or replace as needed.	
9	Notify Agency or owner representative.	

ACCEPTED with COMMENTS in EPA Letter Dated: MAY 21 2013 Under the Federal Insecticide, Fungicide, and Rodenticide Act as amended, for the pesticide, registered under EPA Reg. No. 86256-1

Appendix C

Picture 2. Hydrotest Device



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