

BaHM TREATMENT SYSTEM

Bacteria / Heavy Metals

Hydrocarbons / PFAS

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*PATENT PENDING

OVERVIEW

Introducing the **BaHM™ Treatment System**, the leading technology for bacteria reduction, and industrial heavy metals, and oil removal from site runoff.

BaHM is a revolutionary solution engineered for industrial site owners and cities struggling to meet water treatment regulations with a cost-effective long-term solution. This advanced system is designed to tackle the challenges of industrial site stormwater treatment, ensuring efficient pollution control, reduced environmental impact, and compliance with stringent water quality standards.

SYSTEM ADVANTAGES

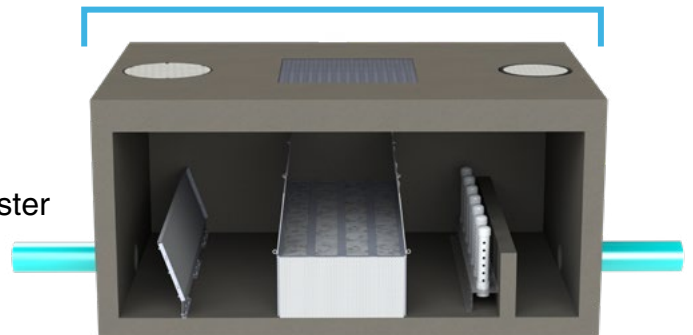
- 1 No Pumps or Electrical Systems**
BaHM operates without the need for pumps and electronic controls, reducing maintenance, and operational costs and complexities.
- 2 Superior Flow Rate**
Achieves up to 4x the flow rate compared to standard carbon and resin systems, facilitating faster and more efficient water treatment.
- 3 Sustainable and Cost-Effective Features**
Offers up to 30% lower disposal costs than alternative media. The secret? A drastic reduction in retained water weight – just 1%, as opposed to the 30%-35% seen in carbon and resin systems.
- 4 Unmatched Pollutant Removal**
Delivers significantly higher dissolved pollutant removal efficiency, making it a leader in its class.
- 5 Versatile Media Storage**
Capable of accommodating four different media types for targeted pollutant removal. From standard oils and greases to heavy metals, bacteria, and emerging contaminants. (Note: PFAS treatment capabilities coming soon).



ABTECH Media Options



Santa Fe System Design





POLLUTANT REMOVALS / REDUCTION

ABTECH SMART SPONGE® MEDIA VARIATIONS



| Smart Sponge | Smart Sponge Plus | Smart Sponge HM | Smart Sponge AC | Smart Sponge Quanta |
|-----------------------|-------------------|---------------------------------------|-------------------------------------|---------------------|
| Removals | Removals | Removals | Removals | Removals |
| Hydrocarbons and Oils | Bacteria | Dissolved Heavy Metals and Phosphates | Dissolved Hydrocarbons and Organics | PFAS |

BACTERIA Smart Sponge Plus

| Contaminant | % Removal |
|----------------------------|----------------|
| Escherichia Coli (E. Coli) | > 99.98 |
| Fecal Coliform | > 99.80 |
| Enterococcus | > 99.90 |

HYDROCARBONS Smart Sponge

| Contaminant | % Removal |
|--------------|-------------|
| C6 - C9 | 99.7 |
| C10 - C14 | 99.8 |
| C15 - C36 | 99.7 |
| > C10 | 99.9 |
| Benzene | 99.4 |
| Toluene | 99.9 |
| Ethylbenzene | 99.7 |

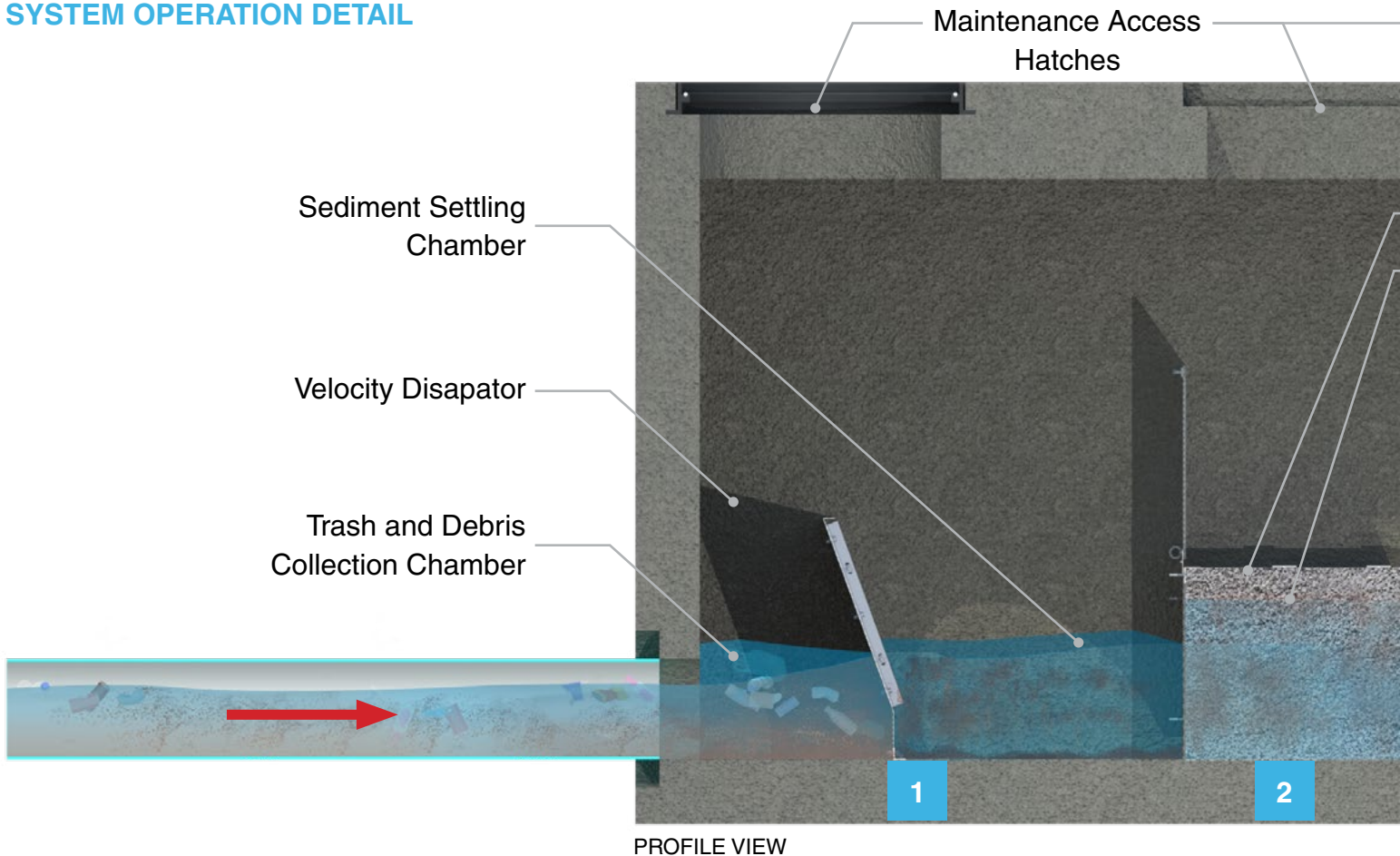
INDUSTRIAL METALS Smart Sponge HM

| Contaminant | Influent | SS HM Effluent | % Removal |
|---------------------|----------|----------------|--------------|
| Aluminum (ppb) | 24.13 | 3.58 | 85.25 |
| Arsenic (ppb) | 32.00 | 2.94 | 90.8 |
| Cadmium (ppb) | 109.51 | 9.04 | 91.7 |
| Chromium (ppb) | 8.60 | 1.17 | 86.4 |
| Copper (mg/l) | 3.00 | 0.11 | 96.2 |
| Hydrocarbons (mg/l) | 56.00 | 3.14 | 94.4 |
| Iron (mg/l) | 12.00 | 1.30 | 89.2 |
| Lead (ppb) | 34.54 | 4.22 | 87.8 |
| Manganese (mg/l) | 4.37 | 1.05 | 76.0 |
| Molybdenum (mg/l) | 2.20 | 0.31 | 85.9 |
| Selenium (ppb) | 2.15 | 0.28 | 87.0 |
| Strontium (mg/l) | 2.81 | 2.49 | 11.4 |
| Zinc (mg/l) | 25.14 | 4.35 | 82.7 |
| Total Phosphorus | 8.20 | 0.24 | 97.1 |

PFAS REMOVAL Smart Sponge Quanta

| 5x Higher Flow Rate | Rapid PFAS Removal | Low-Energy Solution | Seamless Scalability | Cost Savings |
|---|--|--|---|--|
| Treats water at 40 GPM/SF, far surpassing conventional solutions. | Reduces contamination from 4,100 ppt to <5 ppt in under two minutes. | Operates with gravity flow or low-pressure pumps—no high-energy demands. | Easily integrates into existing treatment systems with minimal modifications. | 50% lower capital costs, 35% lower operational costs vs. other treatments. |

SYSTEM OPERATION DETAIL



SYSTEM OPERATION STAGES

1

Stage 1: Trash & Sediment Collection

Two stages of separation trap large trash, sediment, and hydrocarbons.

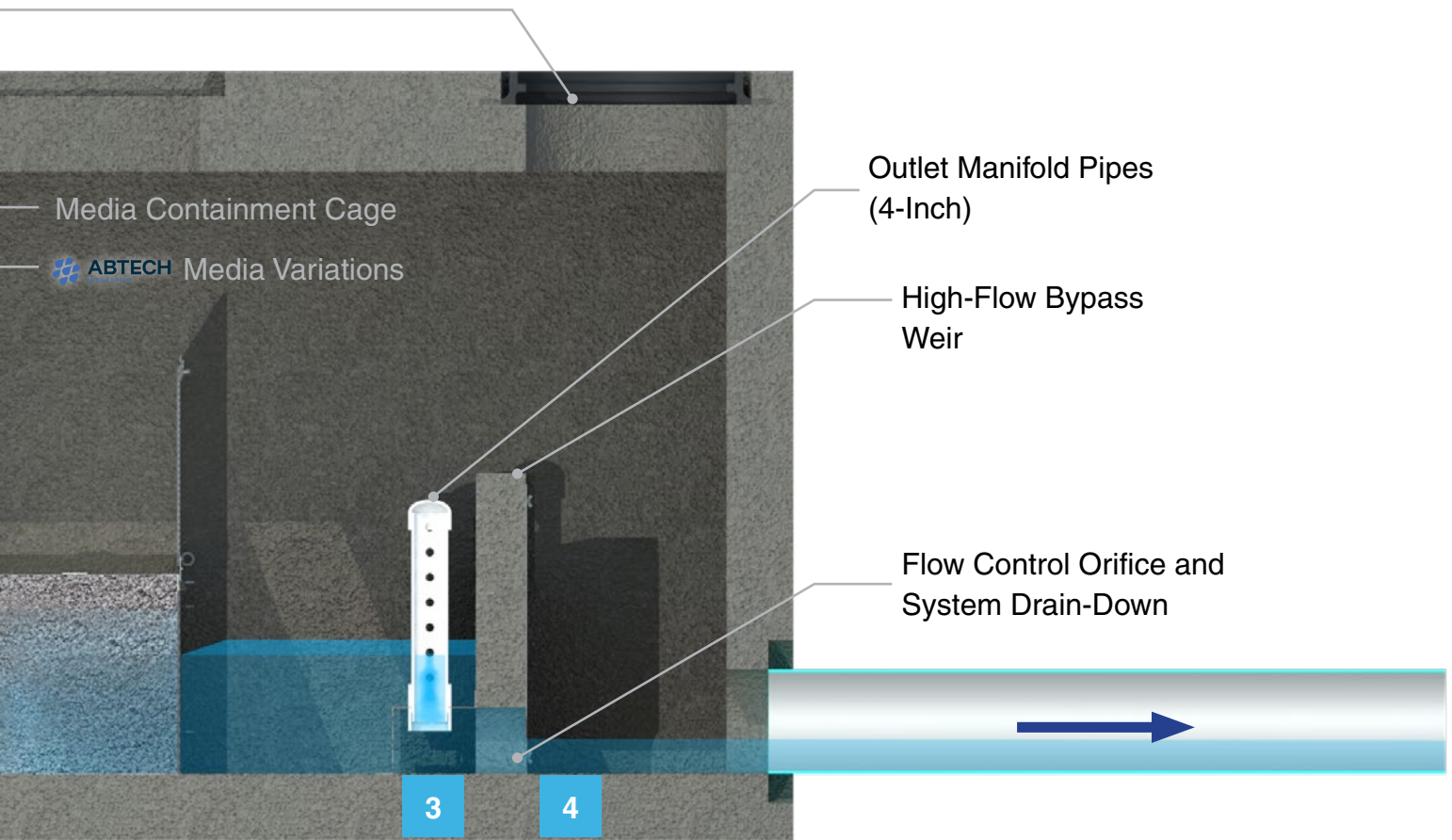
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Stage 2: Media Filtration

Single or multiple media types target various pollutants of concern.

DESIGN ADVANTAGES:

- Horizontal or Upflow System Design
- Very Low Head Requirements
- Zero Invert Out Differential
- Design Meets H-20 Load Ratings
- Easy Vac Truck Cleaning & Maintenance
- Above or Below Grade Applications
- Can be Equipped to Target Specific POCs
- System Drains Down to Prevent Standing Water Issues
- A High-Flow Bypass Weir Prevents System Flooding During Abnormal, High-Volume Events



3

Stage 3: Controlled Discharge

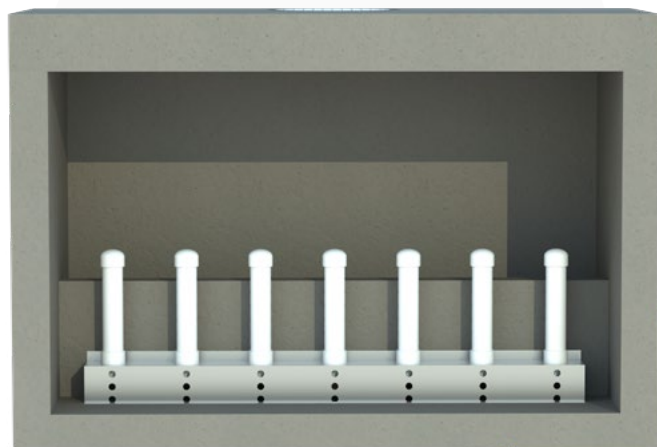
An engineered manifold design effectively manages treatment and discharge volumes.

4

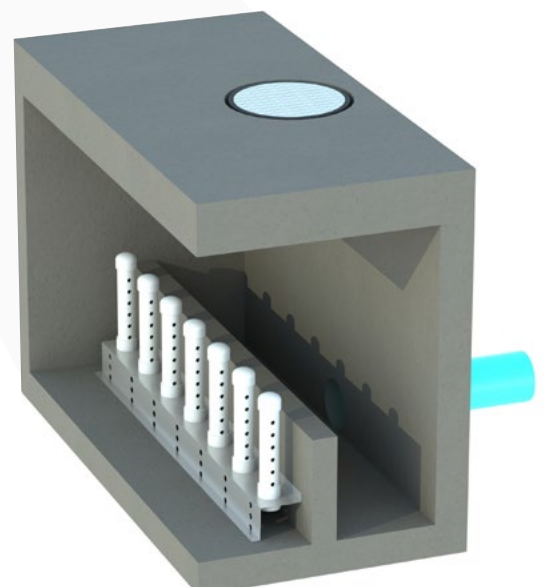
Stage 4: Drain-Down & High-Flow Bypass

The system is designed to completely drain down, and allow for safe flows during extreme weather events.

OUTLET MANIFOLD DETAIL



DOWNSTREAM VIEW



ISOMETRIC VIEW

MEDIA SPECIFICATIONS

Smart Sponge® Plus by 

DESCRIPTION

Smart Sponge® technology is a proprietary blend of synthetic polymers for removing oil derivatives from water by absorption. It has a very porous structure with hydrophobic and oleophilic characteristics capable of selectively removing hydrocarbons while maintaining high flow rates. Oil and hydrocarbons are permanently bound, resulting in a non-leaching condition.

Built upon this core technology, AbTech has created a line of products to treat a variety of constituents while maintaining the superior hydraulic and adsorption characteristics of Smart Sponge.

| Media Specifications | Smart Sponge® |
|----------------------|--------------------------------------|
| Media Color | White |
| Treatment Flow Rate | 40 - 60 GPM / ft.² |
| Maximum Temperature | 130°F |
| Density | 14-18 lb. / ft.³ |
| Pressure Drop | 1 psi |
| Specific Gravity | 1.05 lb. / ft.³ |



Smart Sponge®

COMMERCIALIZATION

Smart Sponge® media delivers adaptability for a wide range of industries. Previous and ongoing applications include:

- Department of Defense Airport and Transportation Grants
- The BaHM™ Stormwater Treatment System
- Construction Dewatering
- Municipal Water Treatment and Reuse
- Industrial Process Water Treatment



DISPOSAL

Smart Sponge® samples saturated with hydrocarbons have been tested according to the EPA’s Toxicity Characteristic Leaching Procedure (“TCLP”). These tests show that Smart Sponge is a “non-leaching” (i.e. non-detect or “N.D.”) product. As a result, Smart Sponge provides cost-effective, eco-friendly disposal options, subject to your local regulations.

Note: User is responsible for the proper disposal of media.





Stormwater Quality Systems



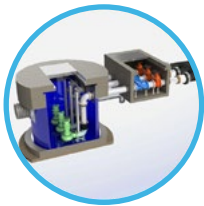
Bacteria & Heavy Metals



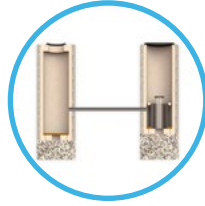
Harvesting & Reuse



Detention & Retention



Pump Stations



Dry Wells



Infiltration



Filtration

Additional Water Infrastructure Products



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