State of New Jersey

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Nonpoint Pollution Control
Division of Water Quality
401-02B
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Trenton, New Jersey 08625-0420
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http://www.state.nj.us/dep/dwq/bnpc_home.htm

CATHERINE R. MCCABE
Commissioner

June 11, 2019

Zachariha J. Kent
Director of Research & Development
BioClean Environmental Services, Inc.
P. O. Box 869
Oceanside, CA 92049

Re: MTD Lab Certification
Debris Separating Baffle Box (DSBB™) Hydrodynamic Separator by BioClean Environmental Services, Inc.
On-line Installation

TSS Removal Rate 50%

Dear Mr. Kent:

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7(c) 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). BioClean Environmental Services, Inc. has requested an MTD Laboratory Certification for the Debris Separating Baffle Box (DSBB™).

The project falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advance Technology" dated January 25, 2013. The applicable protocol is the "New Jersey Laboratory Testing Protocol to Assess Total Suspended Solids Removal by a Hydrodynamic Sedimentation Manufactured Treatment Device" dated January 25, 2013.

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 May 2019) for this device is published online at http://www.njcat.org/verification-process/technology-verification-database.html.

The NJDEP certifies the use of the Debris Separating Baffle Box (DSBB™) by BioClean Environmental Services, Inc. at a TSS removal rate of 50% 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 DSBB™ 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 DSBB™ 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 9.6 of the New Jersey Stormwater Best Management Practices (NJ Stormwater BMP) Manual, which can be found online at www.njstormwater.org.

5. The maintenance plan for a site using this device shall incorporate, at a minimum, the maintenance requirements for the DSBB. A copy of the maintenance plan is attached to this certification. However, it is recommended to review the maintenance website at https://biocleanenvironmental.com/wp-content/uploads/2019/02/Operations-Maintenance-DSBB-NJDEP-PSD.pdf for any changes to the maintenance requirements.

6. Sizing Requirement:

   The example below demonstrates the sizing procedure for the DSBB™:

   Example: A 0.25-acre impervious site is to be treated to 50% TSS removal using a DSBB™. The impervious site runoff (Q) based on the New Jersey Water Quality Design Storm was determined to be 0.79 cfs.

   Maximum Treatment Flow Rate (MTFR) Evaluation:

   The site runoff (Q) was based on the following:
   time of concentration = 10 minutes
   i = 3.2 in/hr (page 5-8, Fig. 5-3 of the NJ Stormwater BMP Manual)
   c = 0.99 (runoff coefficient for impervious)
   Q = ciA = 0.99 x 3.2 x 0.25 = 0.79 cfs

   Given the site runoff is 0.79 cfs and based on Table 1 below, the DSBB Model 2.5-5 with an MTFR of 1.10 cfs would be the smallest model approved that could be used for this site to remove 50% of the TSS from the impervious area without exceeding the MTFR.

The sizing table corresponding to the available system models is noted below. Additional specifications regarding each model can be found in the Verification Appendix under Tables A-1 through A-3.

Table A-1 DSBB Models and Associated MTFRs

DSBB Model #	Inside Length (ft)	Inside Width (ft)	Maximum Treatment Flow Rate, MTFR[1] (cfs)	50% Maximum Sediment Storage Area Volume (ft^3)
2-4	4.00	2.00	0.70	3.88
2.5-5	5.00	2.50	1.10	6.09
3-6	6.00	3.00	1.59	8.81
4-6	6.00	4.00	2.11	11.75
4-8	8.00	4.00	2.82	15.75
5-10	10.00	5.00	4.40	23.34
6-12	12.00	6.00	6.34	34.00
7-14	14.00	7.00	8.63	46.67
8-14	14.00	8.00	9.86	53.34
8-16	16.00	8.00	11.27	61.34
9-18	18.00	9.00	14.27	76.50
10-18	18.00	10.00	15.85	85.00
10-20	20.00	10.00	17.61	95.00
10-22	22.00	10.00	19.37	105.00
11-22	22.00	11.00	21.31	115.50
11-24	24.00	11.00	23.25	126.50
12-24	24.00	12.00	25.36	138.00

1. MTFR scaling based on 1.1/12.5 = 0.088 cfs/ft^2

A detailed maintenance plan is mandatory for any project with a Stormwater BMP subject to the Stormwater Management Rules under N.J.A.C. 7:8. The plan must include all of the items identified in the Maintenance requirements section of the Stormwater Management Rules under 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 Mr. Nick Grotts of my office at (609) 633-7021.

Sincerely,

Gabriel Mahon, Chief
Bureau of Nonpoint Pollution Control

Attachment: Maintenance Plan

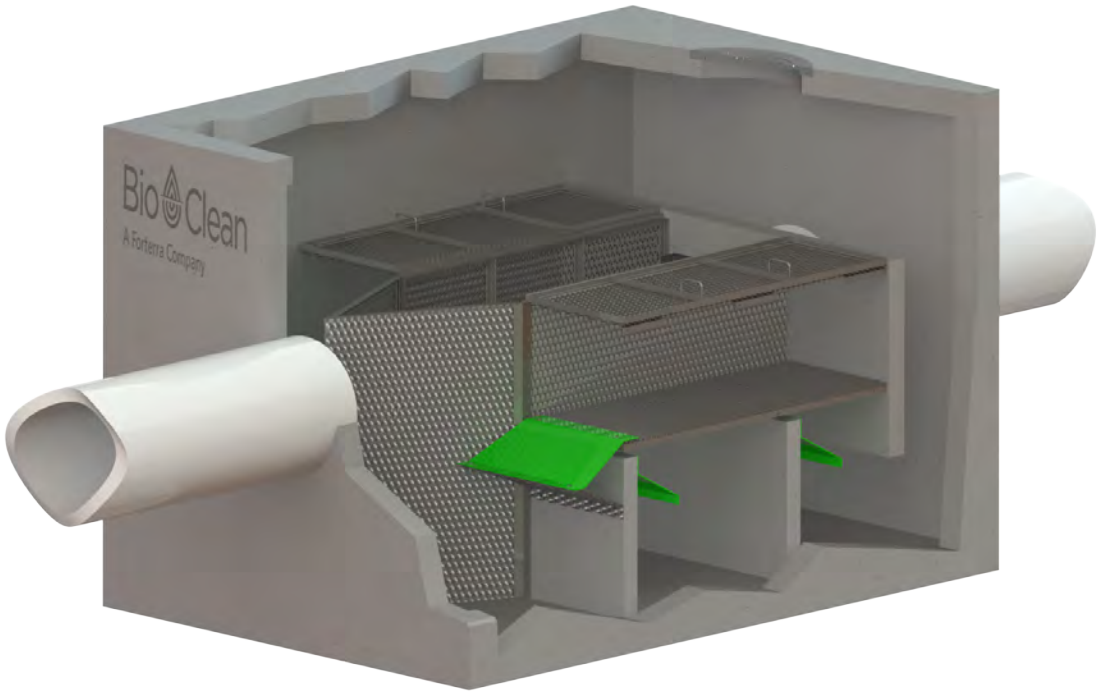
cc: Chron File
Richard Magee, NJCAT
Jim Murphy, NJDEP-BNPC
Vince Mazzei, NJDEP - DLUR
Nicholas X. Grotts, NJDEP - BNPC

DUAL STAGE

Hydrodynamic Separator (DSBB)

Bio Clean
A Forterra Company

OPERATION & MAINTENANCE



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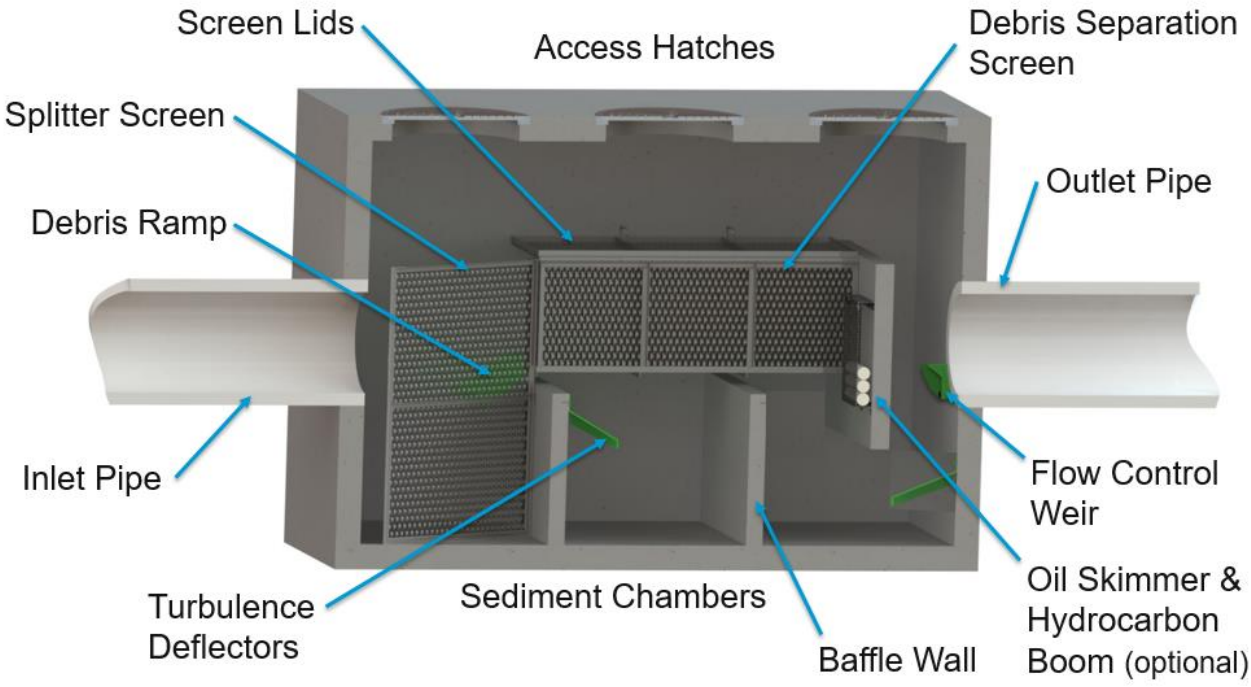
OPERATION & MAINTENANCE

The Debris Separating Baffle Box (DSBB), a stormwater dual-stage Hydrodynamic Separator is designed to remove high levels of trash, debris, sediments and hydrocarbons. The innovative screening system directs floatable trash, debris, and organics into raised filtration screens for dry state storage which prevents septic conditions, odor, nutrient leaching and allows for easy removal. The raised filtration screens are assisted by a non-clogging inlet splitting screen which directs flows to the filtration screens while maintaining high treatment flow rates. The DSBB is able to effectively capture and store sediment with no maintenance or loss of treatment capacity for several years based on annual average loading in most regions.

Yet, as with all stormwater BMPs, inspection and maintenance on the DSBB Hydrodynamic Separator is necessary. Stormwater regulations require that all BMPs be inspected and maintained to ensure they are operating as designed to allow for effective pollutant removal and provide protection to receiving water bodies. It is recommended that inspections be performed multiple times during the first year to assess site-specific loading conditions. This is recommended because pollutant loading can vary greatly from site to site. Variables such as nearby soil erosion or construction sites, winter sanding of roads, amount of daily traffic and land use can increase pollutant loading on the system. The first year of inspections can be used to set inspection and maintenance intervals for subsequent years. Without appropriate maintenance a BMP can exceed its storage capacity which can negatively affect its continued performance in removing and retaining captured pollutants.



Inspection Equipment

Following is a list of equipment to allow for simple and effective inspection of the DSBB Separator:

- Bio Clean Environmental Inspection Form (contained within this manual).
- Flashlight.
- Manhole hook or appropriate tools to remove access hatches and covers.
- Appropriate traffic control signage and procedures.
- Measuring pole and/or tape measure.
- Protective clothing and eye protection.
- Note: entering a confined space requires appropriate safety and certification. It is generally not required for routine inspections or maintenance of the system.

Inspection Steps

The core to any successful stormwater BMP maintenance program is routine inspections. The inspection steps required on the DSBB are quick and easy. As mentioned above the first year should be seen as the maintenance interval establishment phase. During the first year more frequent inspections should occur in order to gather loading data and maintenance requirements for that specific site. This information can be used to establish a base for long-term inspection and maintenance interval requirements.

The DSBB Separator can be inspected though visual observation without entry into the system. All necessary pre-inspection steps must be carried out before inspection occurs, especially traffic control and other safety measures to protect the inspector and nearby pedestrians from any dangers associated with an open access hatch or manhole. Once these access covers have been safely opened the inspection process can proceed:

- Prepare the inspection form by writing in the necessary information including project name, location, date & time, unit number and other info (see inspection form).
- Observe the inside of the system through the access hatches. If minimal light is available and vision into the unit is impaired utilize a flashlight to see inside the system.
- Look for any out of the ordinary obstructions in the inflow pipe, sediment chambers, filtration screens, splitter screen, or outflow pipe. Write down any observations on the inspection form.

- Through observation and/or digital photographs estimate the amount of floatable debris accumulated inside the filtration screens. Record this information on the inspection form. Check both the right and left filtration screens if applicable.
- Utilizing a tape measure or measuring stick estimate the amount of sediment accumulated in each of the three sediment chambers. Record this depth on the inspection form.
- Observe the condition and color of the hydrocarbon booms and any floating oils in front of the boom cage. Record this information on the inspection form.
- Finalize inspection report for analysis by the maintenance manager to determine if maintenance is required.

Maintenance Indicators

Based upon observations made during inspection, maintenance of the system may be required based on the following indicators:

- Missing or damaged internal components.
- Obstructions in the system or its inlet or outlet.
- Excessive accumulation of floatable trash, debris and foliage in the filtration screens in which the length and width of the chambers screens is more than half full and/or flow into the screens is fully impeded by these debris. Large items blocking the entrance.
- Excessive accumulation of sediment in any of the three separation chambers is more than half-full (6”). See chart below:

DSBB Model #	Inside Length (L), ft	Inside Width (W), ft	Partition Height (PH), ft	Partition Thickness (PT), ft	Floor Area (FA), ft^2	50% Maximum Sediment Storage Area Volume, ft^3	Sediment Removal Interval (SRI),
2-4	4.00	2.00	2.50	0.06	7.75	3.88	39
2.5-5	5.00	2.50	2.50	0.06	12.19	6.09	40
3-6	6.00	3.00	2.50	0.06	17.63	8.81	40
4-6	6.00	4.00	2.50	0.06	23.50	11.75	40
4-8	8.00	4.00	3.25	0.06	31.50	15.75	40
5-10	10.00	5.00	4.00	0.33	46.67	23.34	38
6-12	12.00	6.00	4.75	0.33	68.00	34.00	38
7-14	14.00	7.00	5.25	0.33	93.34	46.67	39
8-14	14.00	8.00	6.00	0.33	106.67	53.34	39
8-16	16.00	8.00	6.00	0.33	122.67	61.34	39
9-18	18.00	9.00	6.75	0.50	153.00	76.50	38
10-18	18.00	10.00	7.50	0.50	170.00	85.00	38
10-20	20.00	10.00	7.50	0.50	190.00	95.00	39
10-22	22.00	10.00	8.00	0.50	210.00	105.00	39
11-22	22.00	11.00	8.00	0.50	231.00	115.50	39
11-24	24.00	11.00	8.75	0.50	253.00	126.50	39
12-24	24.00	12.00	8.75	0.50	276.00	138.00	39

Maintenance Equipment

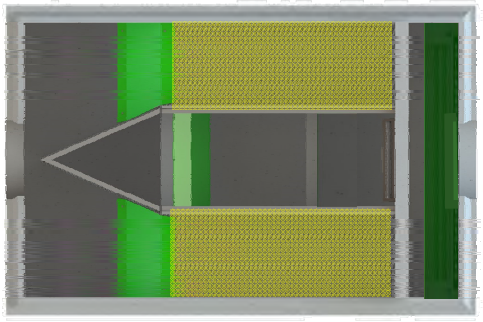
It is recommended that a vacuum truck be utilized to minimize the time required to maintain the DSBB Separator:

- Bio Clean Environmental Maintenance Form (contained in O&M Manual).
- Flashlight.
- Manhole hook or appropriate tools to access hatches and covers.
- Appropriate traffic control signage and procedures.
- Protective clothing and eye protection.
- Note: entering a confined space requires appropriate safety and certification. It is generally not required for routine maintenance of the system. Exception is deeper units entry may be required to open filtration screen lids and replace hydrocarbon booms.
- Vacuum truck (with pressure washer attachment preferred).

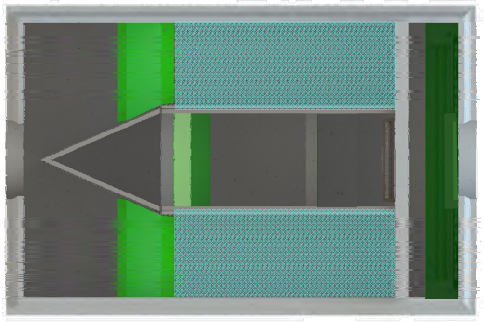
Maintenance Procedures

It is recommended that maintenance occurs at least three days after the most recent rain event to allow for drain down from any associated upstream detention systems. Maintaining the system while flows are still entering it will increase the time and complexity required for maintenance. Debris captured in the filtration screens requires time to dry out which decreases time to remove and associated weight. Cleaning of the filtration screens and sediment chambers can be performed from finish surface without entry into the vault utilizing a vacuum truck on most installations. Depth and configuration of the installation may create conditions which would require entry for some or all of the maintenance procedures. Configuration and size of access hatches also effects the conditions in which entry may be required. Once all safety measures have been set up cleaning of the filtration screens, hydrocarbon boom(s) and/or sediment chambers can proceed as followed:

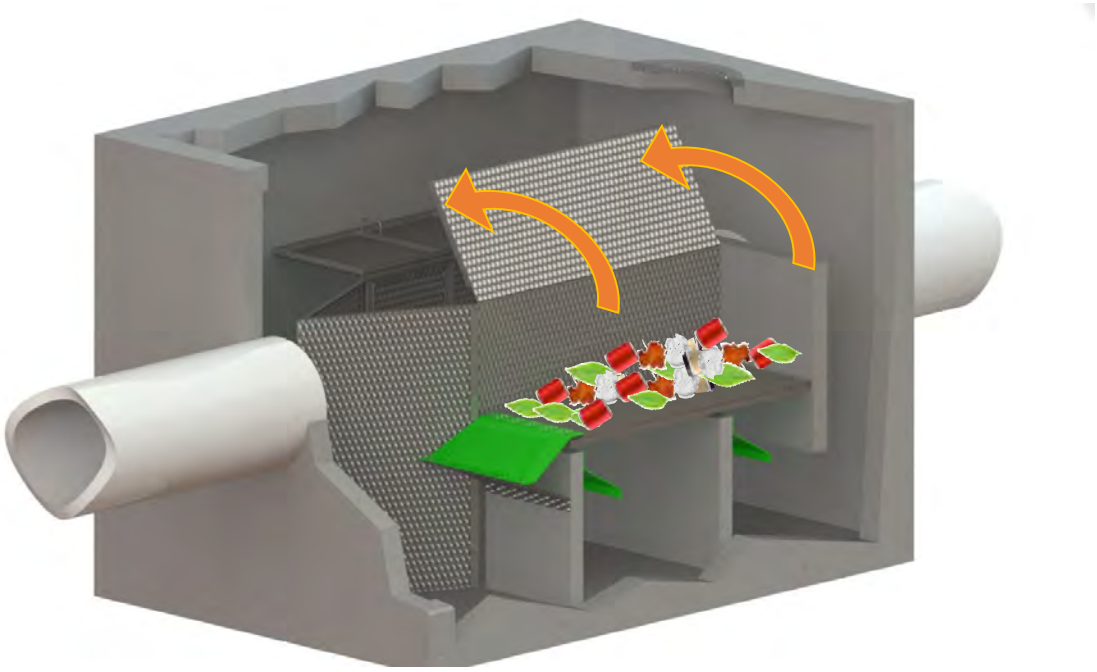
- Remove all access hatches (requires traffic control and safety measures to be completed prior).
- Locate the right and left filtration screens. Manhole or hatch access will be provided to each of these screens. As highlighted below. Depending on the configuration of the DSBB the filtration screens may or may not have hinged lids depending on factors such as online or offline bypass, water level at peak flow, back flow conditions amongst other site-specific variables. Units that have lids are designed with hinges and locking mechanisms along the sidewall of the structure that can be unlocked by finish surface with an extension rod. The length of this rod is limited and for deeper installs entry may be required to unlock and open the lids.



Top view into DSBB. Filtration screens highlighted in yellow without hinged lids.



Top view into DSBB. Filtration screens highlighted in turquoise with hinged lids.

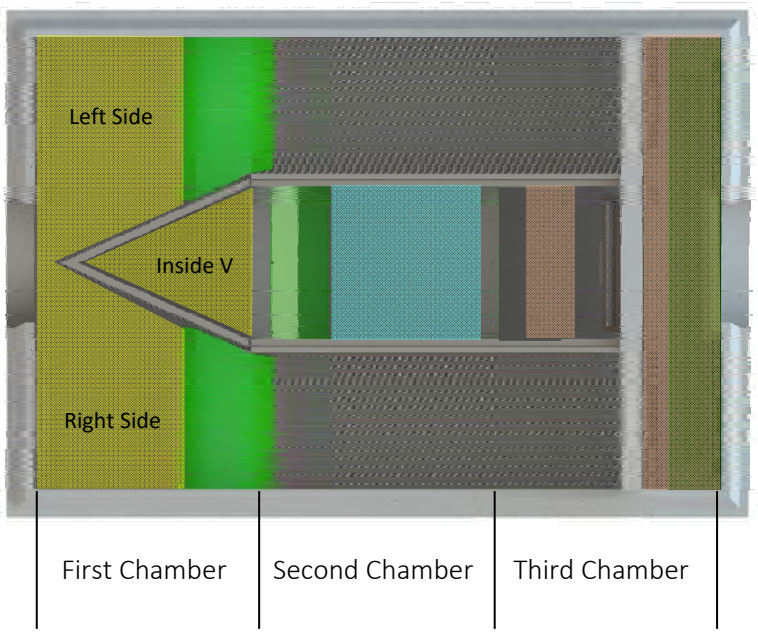


Isometric view into the DSBB illustrating the hinged lids of the filtration screens. Lids can hinge up and toward the center up to 180 degrees from closed & locked position for easy access for cleaning and removal of debris.

- Once filtration screens lids are opened (if applicable) the vacuum hose extension is inserted down into the screens for removal of debris. The width of the screen of the smallest model is 9” therefore allowing an standard 8” vacuum hose to be used for all models and sizes. All debris should be removed with the vacuum hose and the pressure washer should be used to

spray down and remove all debris on the bottom, side and top screens. Ensure all holes within in the screen are cleared of debris. This is critical to restoring the full hydraulic capacity of the filtration screens. Once completed close and lock lids (if applicable).

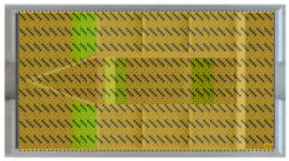
- Using an extension on a vacuum truck position the hose over the opened access hatch or hatches leading to the first sediment chamber adjacent to the pipe inlet and includes the splitter screen. Lower vacuum hose into the sediment chamber on the left and right side of the splitter screen. This is where a majority of the larger sediments and heavy debris will accumulate. Remove all floating debris, standing water and sediment from this sediment chamber. Vertical access to the bottom of the sediment chamber is unimpeded. The vac hose can be moved from side-to-side to fully remove sediments at the corners. A power washer can be used to assist if sediments have become hardened and stuck to the walls or the floor of the chamber. The power washer should also be used to spray the splitter screen clean of any accumulated debris. The vacuum hose can also be inserted on the outlet side of the splitter screen (inside the V) to remove any remaining accumulated sediment.



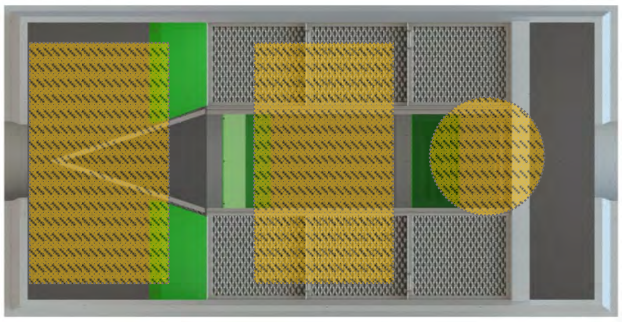
Top view into DSBB illustrating the three sediment chambers.

- The **yellow** highlighted areas show where the vacuum hose should be inserted for cleaning of the **first** sediment chamber.
- The **turquoise** highlighted area show where the vacuum hose should be inserted for cleaning of the **second** sediment chamber.
- The **orange** highlighted areas shows where the vacuum hose is inserted for cleaning of the **third** sediment chamber.

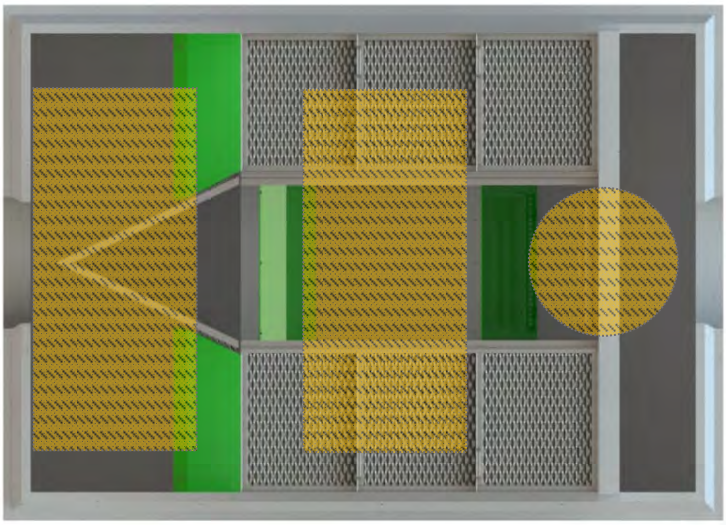
- Repeat the same procedure in the second and third sediment chambers in the locations shown in the above diagrams. Access to these two chambers is in the center of the system unlike the first sediment chamber. The filtration screens cover the sediment chamber along the sides, yet allow for unimpeded access in the middle without requirement to open filtration chamber tops or go through the filtration screens (hinged floor) as found with other baffle box systems. Hatch or manhole size, quantity and location vary based on model size and site specific project constraints. Various access hatch sizes and configurations are available to meet individual project requirements. Larger hatches, open assisted hatches and/or taller ID dimensions to increase headroom are available by request. Below are a few examples of various models and optimal hatch configurations.



A DSBB-2.5-4 is offered with a 2.5-4 access hatch in either parkway, direct or indirect traffic rating. This provides full access. Bolt and pull, hinged or hinged with lift-assisted options offered. *Figures not to scale.*

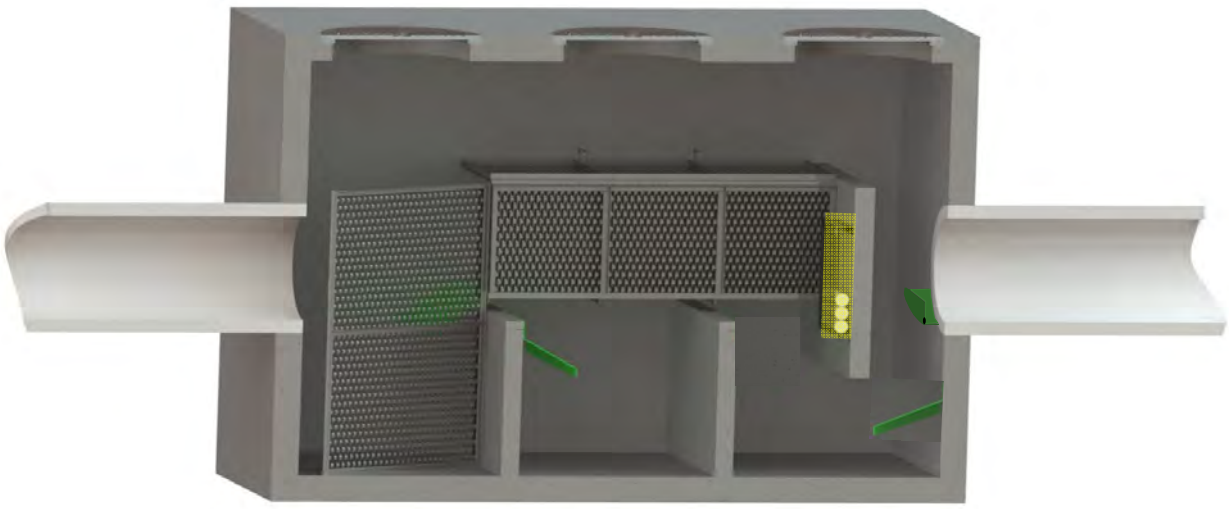


A DSBB-5-10 is offered with two 2.5-4 access hatches in either parkway, direct or indirect traffic rating along with a single 24" diameter manhole for access to the third sediment chamber and hydrocarbon booms. Bolt and pull, hinged or hinged with lift assisted options offered. *Figures not to scale.*

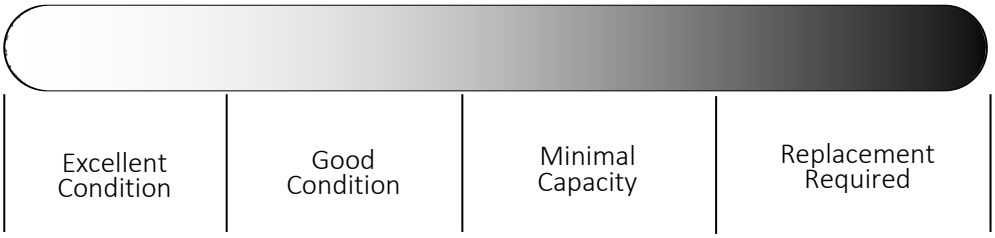


A DSBB-8-14 is offered with two 3-6 access hatches in either parkway, direct or indirect traffic rating along with a single 30" diameter manhole for access to the third sediment chamber and hydrocarbon booms. Bolt and pull, hinged or hinged with lift-assisted options offered. *Figures not to scale.*

- Based on the color of the hydrocarbon booms replacement may be necessary. The booms are housed inside the boom cage which is attached to the influent side of the oil skimmer wall. The cage has a hinged top which is opened allowing access to the hydrocarbon booms. Once old booms are removed new booms can be dropped in and the top closed. See below image.



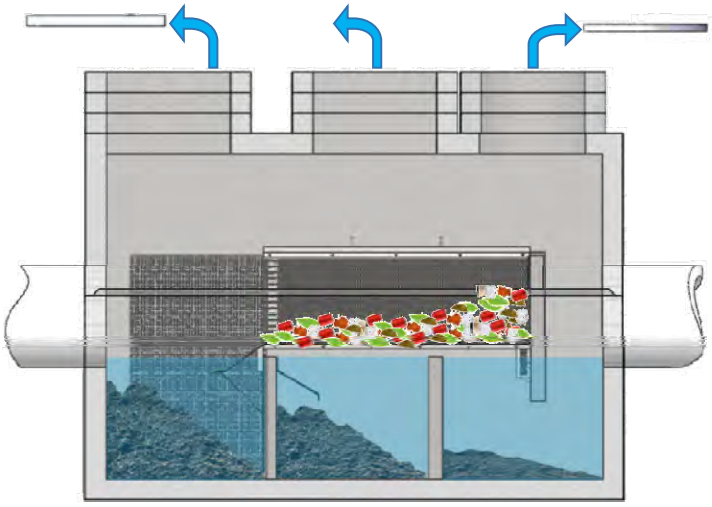
- Follow is a replacement indication color chart for the hydrocarbon booms:



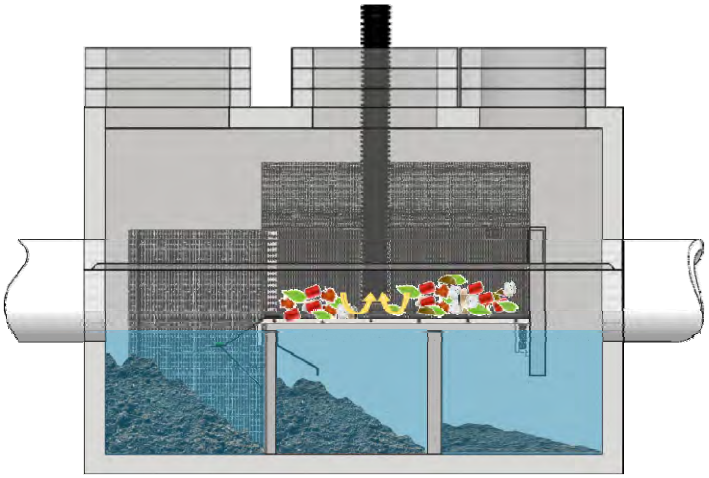
- NOTE: Filtration screens can be cleaned before or after cleaning and removal of sediment for the sediment chambers. Cleaning them before is preferred before removing sediment and standing water from the second and third chamber as debris and water will be deposited on the sediment chamber floors in the process of cleaning the filtration screens over the second and third chamber. Cleaning the first sediment chamber before the filtration screens allows the splitter screen to be fully exposed. Thus the pressure washing of all screens (splitter and filtration) can be done as the same time if needed.
- The last step is to close up and replace all access hatches and remove all traffic control.
- All removed debris and pollutants shall be disposed of following local and state requirements.

- Disposal requirements for recovered pollutants may vary depending on local guidelines. 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.
- In the case of damaged components, replacement parts can be ordered from the manufacturer. Hydrocarbon booms can also be ordered directly from the manufacturer.

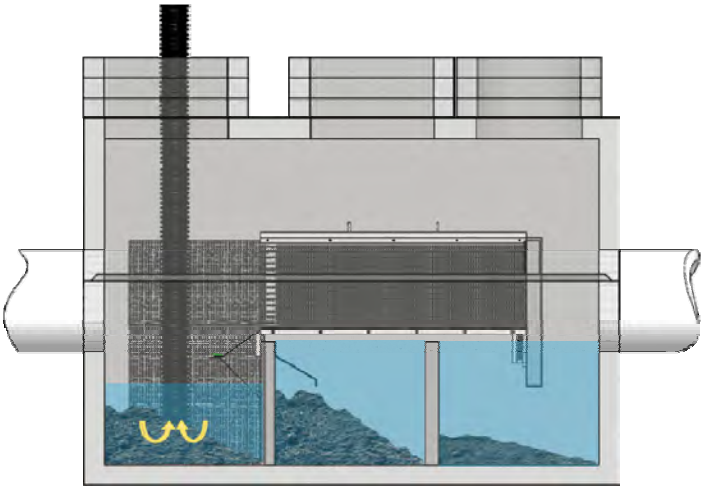
Maintenance Sequence



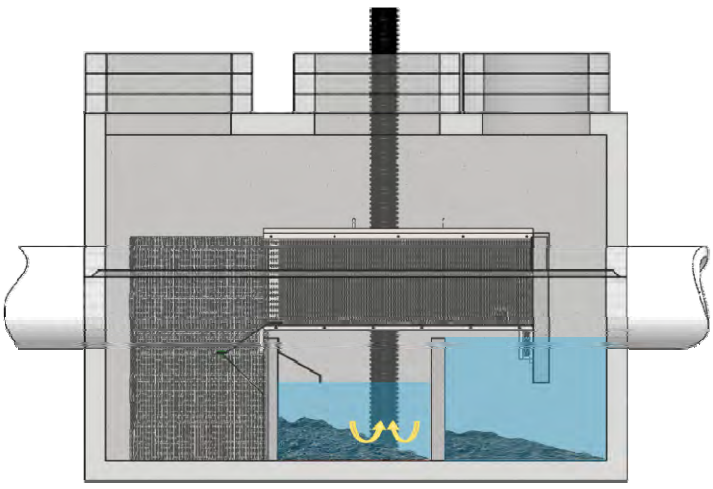
Remove access hatches set up vacuum truck to clean the filtration screens and sediment chamber. Locate positions of filtration screens and first, second and third sediment chambers plus the hydrocarbon boom cage.



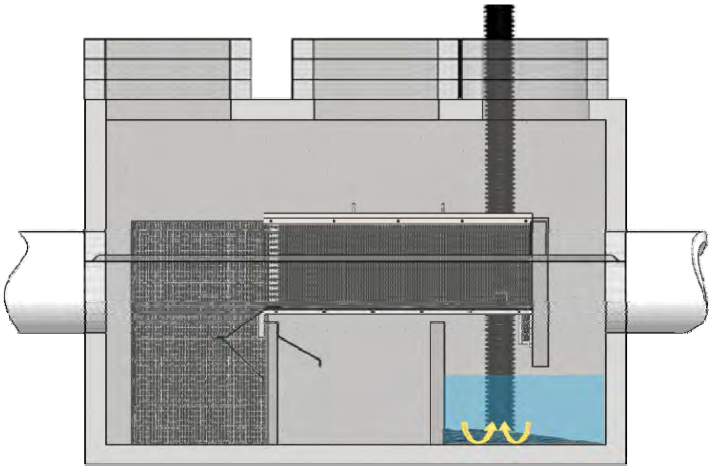
Unlock and open filtration screen lids (if applicable, some units will not have lids). Insert vacuum hose into the first filtration screen and clean out trash & debris. Use a pressure washer to remove any debris stuck on the screens.



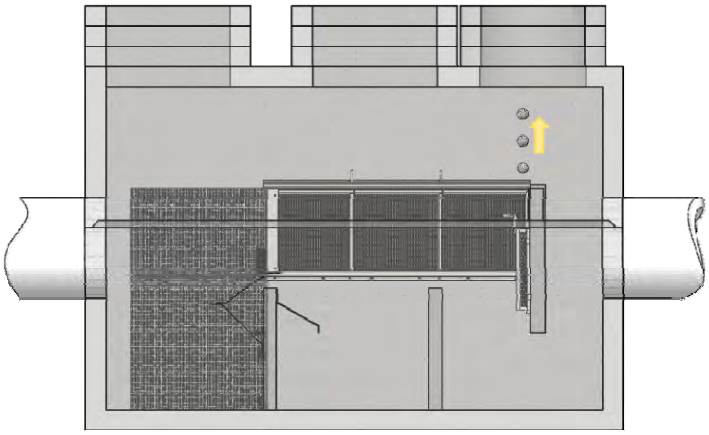
Insert vacuum hose in the first sediment chamber to remove sediment and debris. The vacuum hose will need to be inserted on the right and left side of the splitter screen to remove all sediment. Once completed use a pressure washer to clean off the splitter screen.



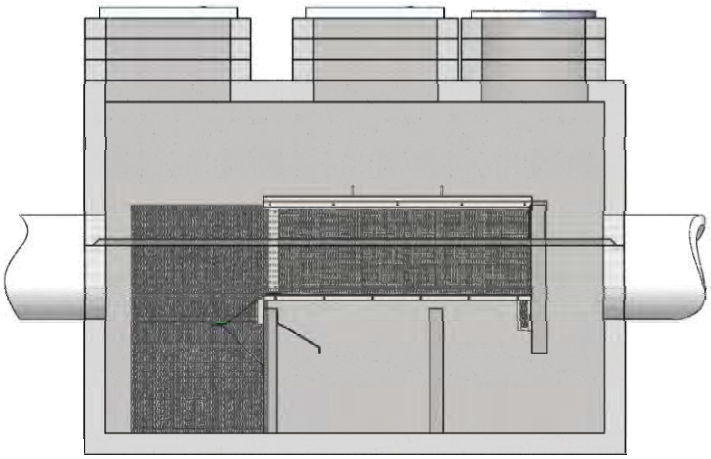
Repeat the above steps for cleaning the second sediment chamber. Compacted sediment can be loosened using a pressure washer.



Repeat the above steps for cleaning the third sediment chamber. Compacted sediment can be loosened using a pressure washer.



Once the unit is fully cleaned check the condition of the hydrocarbon booms in the boom cage hanging on the oil skimmer wall. Use color indicator in this manual to decide if replacement is required. If required open boom cage and replace booms.



Once cleaning and maintenance is complete ensure boom cage lid and filtration screen lids are closed and locked. Replace all manhole covers and or access hatches and remove traffic control.

For Maintenance Services or Information Please Contact Us At:
760-433-7640
Or Email: info@biocleanenvironmental.com

Inspection and Maintenance Report
Bio Clean Debris Separating Baffle Box

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

Site Map #	GPS Coordinates of Vault	Model #	Debris, Trash and Foliage Accumilation Inside Filtration Screens (lbs)	Sediment Accumulation In Sediment Chambers (lbs) & Depth (inches)	Structural Notes	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:					
	Lat: Long:					
	Lat: Long:					

Comments:

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