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## **Stormwater Sediment Sampling Project Report**

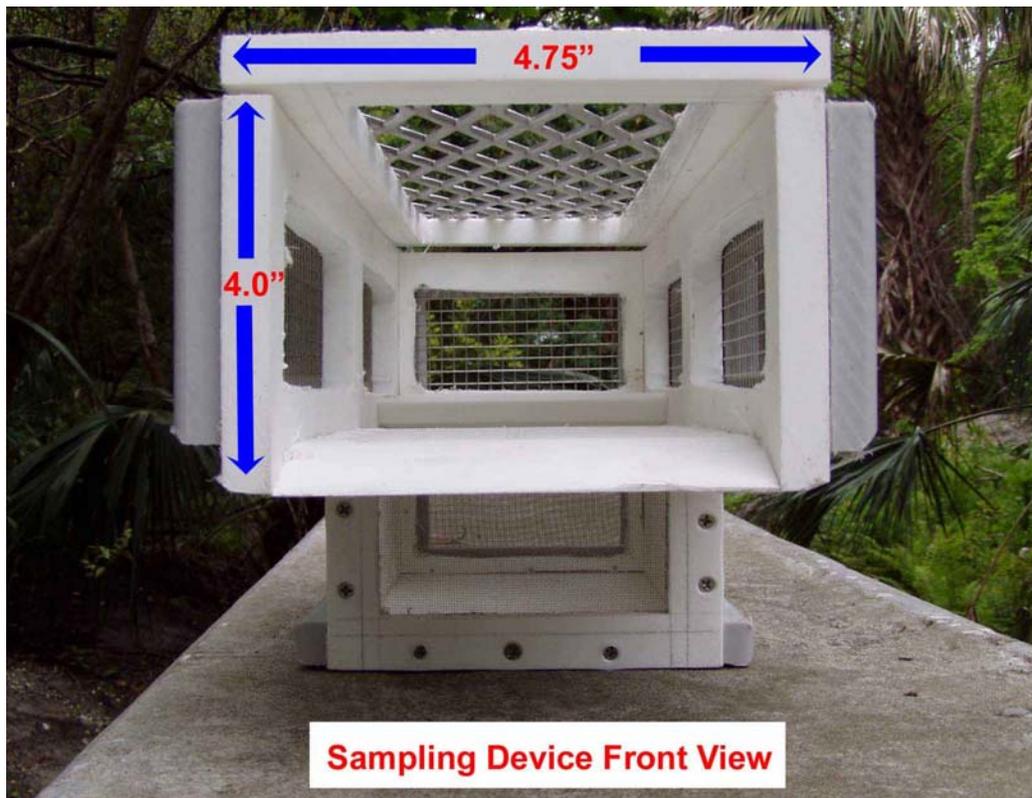
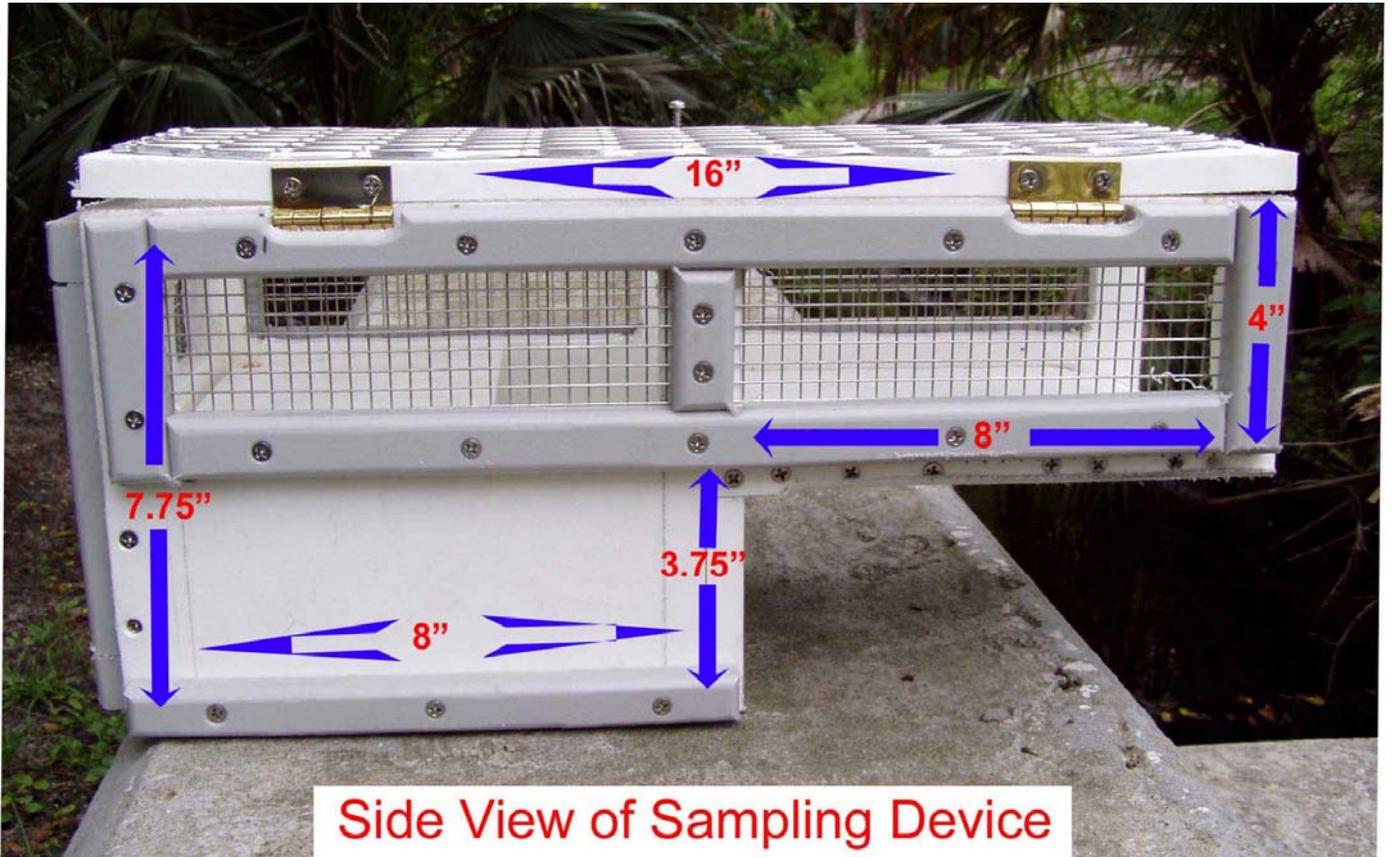
Project ID: SUNTREE\_SED\_001

*Prepared for*

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Sampling Device Description: A Sediment & Debris capturing device 16 inches long, 4 inches high and 4.75 inches wide with a lower catch basin 8 inches long, 3.75 inches high and 4.75 inches wide.



Device components: Upper deck sides and back windowed with #14 mesh.  
Lower deck sides, back, and front windowed with #28 mesh.  
Top covered with aluminum expanded metal grating.

Sampling Location: 7<sup>th</sup> Street Baffle Box on Sherry Drive, Core City Area, Atlantic Beach Florida.



Device Positioning:

Sampling device #1 located at the inlet, or up stream location of the Baffle Box.  
Sampling device #2 located at the outlet, or down stream location of the Baffle Box.

Sample Size and Matrix: 1000 grams of graded quartz sand.

Test Sample Sand Positioning: 12 linear feet up stream of the baffle box in the 24" pipe.

Sieve Set Gradation Results: 500 grams of sand.

Mesh Size	Particle Size	Percent Collected
#6 mesh	3.40 millimeters	0.00 %
#20 mesh	.86 millimeters	99.0%
#40 mesh	.38 millimeters	0.2 %
#100 mesh	.15 millimeters	N/A

500 grams tested through the sieve set.  
499 grams captured by the #20 mesh screen.  
1 gram captured by the #40 mesh screen.

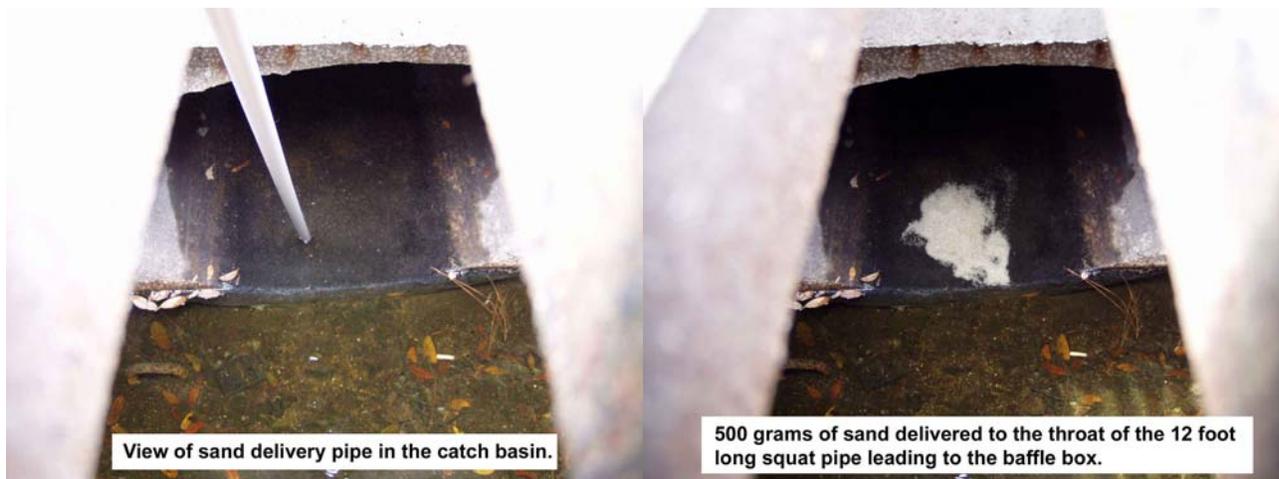
Rainfall Data Collection: Rainfall data will be recorded by the automated Data Logger # 23612 located in the 7<sup>th</sup> Street Stormwater Monitoring Center. Rain amount is recorded in inches every 15 minutes, continuously.

## **Sediment Sampling Protocol:**

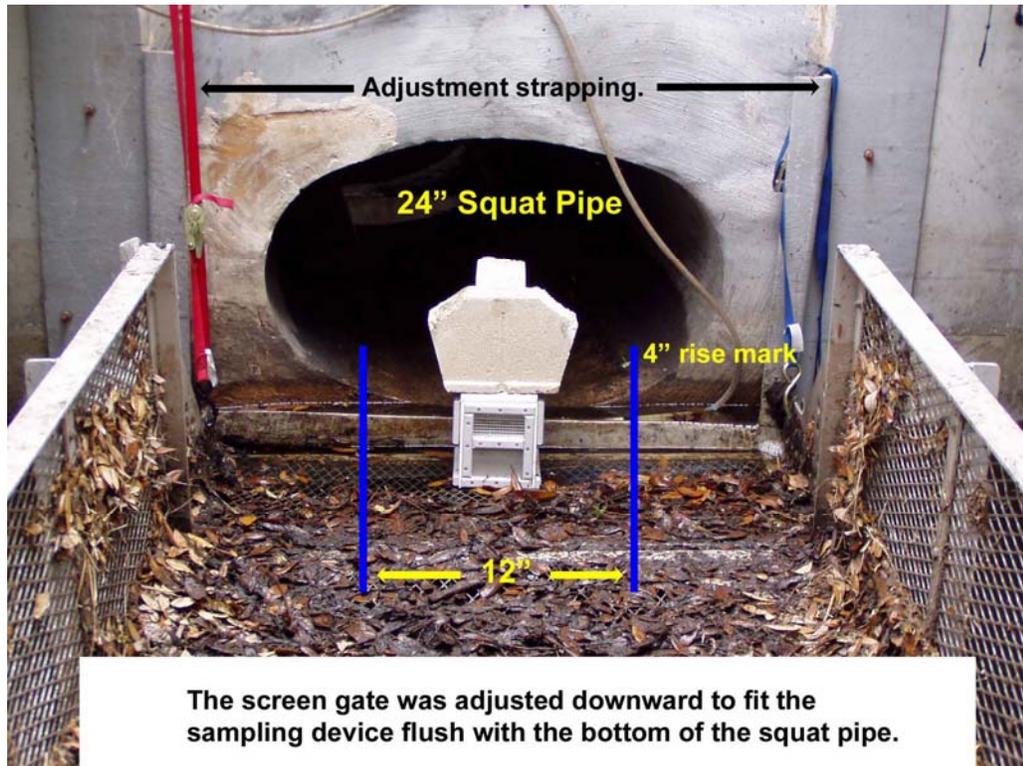
- 1 • Prior to a sizable storm event, .25 inches or greater, 1000 grams of graded sand will be placed the 24 inch squat pipe 12 linear feet from the 7<sup>th</sup> street Baffle Box.



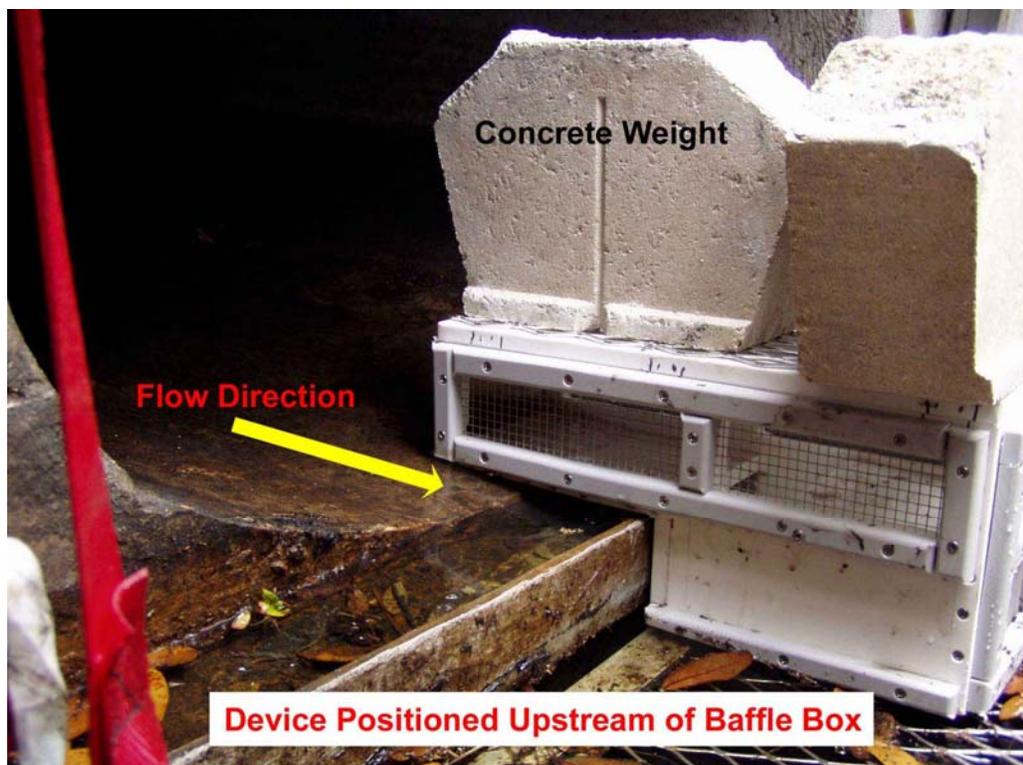
Deliver the sand through the catch basin located at the curb using a 1/2 inch PVC tube. Position the PVC tube at the leading edge of the 24inch squat pipe where it leaves the catch basin to deliver the sand directly into the pipe and not the bottom of the catch basin.



- 2 • Position sampling device #1 inside the baffle box area where the 24 inch squat pipe enters. Adjust the separation screen gate of the baffle box to level the sampling device opening with the 24 inch squat pipe.



Ensure that the lower edge of the sampling device is flush with the bottom of the pipe and that the device is as centered as possible. Weigh the sampling device down with two concrete blocks to hold the sampler in place during the storm event. Place both blocks on the top lid and test for stability.



- 3 • Position sampling device #2 centered on the outfall ledge of the baffle box, facing the baffle box. Weigh the device with one concrete block positioned toward the front opening.



- 4 • Immediately after a storm event, remove both sampling devices, secure them in individual bags, and return them to the laboratory for analysis.



5 • Remove the contents of the devices and place all material collected in a stainless steel drying pans. Allow to air dry for 72 hours and separate the vegetative matter from the sand material. Separate any vegetative matter from the dried sample and weigh the resulting sand.

6 • Wash and clean both samplers removing any dried dirt and soil. Return the devices to the 7<sup>th</sup> street baffle box location, repeat steps one through three and monitor weather activity to predict the following storm event.

**Device Collective Percentage:** The collection percentage is an approximate ratio of the area the sampling device is physically capable of collecting compared to the test area.

**Inlet Sampling Device Percentage-**

Sampling Device = 4.0" X 4.75" > 19 square inches.

24 inch squat pipe @ 4" from the bottom = 4.0" X 16.0" > 64 square inches.

Collective Percentage @ 4.0" from the bottom of the pipe = 30%

**Outlet Sampling Device Percentage-**

Sampling Device = 4.0" X 4.75" > 19 square inches.

Baffle Box outfall ledge @ 4" = 4.0" X 96.0" > 384 square inches.

Collective Percentage @ 4.0" from top of the ledge = 5%

## SAMPLING RESULTS

### Sediment Sample Event #1 – April 12, 2005

Location: **Inlet Sample** - 7<sup>th</sup> Street Baffle Box.

Sediment Sample Size: 1000 grams.

Sediment Matrix: Graded quartz sand.

Device Collective Percentage: 30%

Rainfall Total: 0.76 inches within 150 minuets. (see Data Logger attachment)

**Total Material Retrieved: 42 grams (mixed matrix of vegetative matter and sand)**

<b>Mesh Size</b>	<b>Particle Size</b>	<b>Amount Collected</b>
#6 mesh & greater	< 3.40 millimeters	0 grams
#20 mesh	< .86 millimeters	11 grams
#40 mesh	< .38 millimeters	0 grams
#100 mesh	< .15 millimeters	0 grams

**Total amount of sand collected: 11.0 grams**

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Location: **Outlet Sample** - 7<sup>th</sup> Street Baffle Box.

Sediment Sample Size: 1000 grams.

Sediment Matrix: Graded quartz sand.

Device Collective Percentage: 5%

Rainfall Total: 0.76 inches within 150 minuets. (see Data Logger attachment)

**Total Material Retrieved: 28 grams (mixed matrix of vegetative matter and sand)**

<b>Mesh Size</b>	<b>Particle Size</b>	<b>Amount Collected</b>
#6 mesh & greater	< 3.40 millimeters	0 grams
#20 mesh	< .86 millimeters	0 grams
#40 mesh	< .38 millimeters	0 grams
#100 mesh	< .15 millimeters	0 grams

**Total amount of sand collected: 0.0 grams**

## SAMPLING RESULTS

### Sediment Sample Event #2 – April 26, 2005

Location: **Inlet Sample - 7<sup>th</sup> Street Baffle Box.**

Sediment Sample Size: 1000 grams.

Sediment Matrix: Graded quartz sand.

Device Collective Percentage: 30%

Rainfall Total: 0.33 inches within 120 minuets. (see Data Logger attachment)

**Total Material Retrieved: 60 grams (mixed matrix of vegetative matter and sand)**

<b>Mesh Size</b>	<b>Particle Size</b>	<b>Amount Collected</b>
#6 mesh & greater	< 3.40 millimeters	0.0 grams
#20 mesh	< .86 millimeters	11.0 grams
#40 mesh	< .38 millimeters	5.0 grams
#100 mesh	< .15 millimeters	0.0 grams

**Total amount of sand collected: 16.0 grams**

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Location: **Outlet Sample - 7<sup>th</sup> Street Baffle Box.**

Sediment Sample Size: 1000 grams.

Sediment Matrix: Graded quartz sand.

Device Collective Percentage: 5%

Rainfall Total: 0.33 inches within 120 minuets. (see Data Logger attachment)

**Total Material Retrieved: 26 grams (mixed matrix of vegetative matter and sand)**

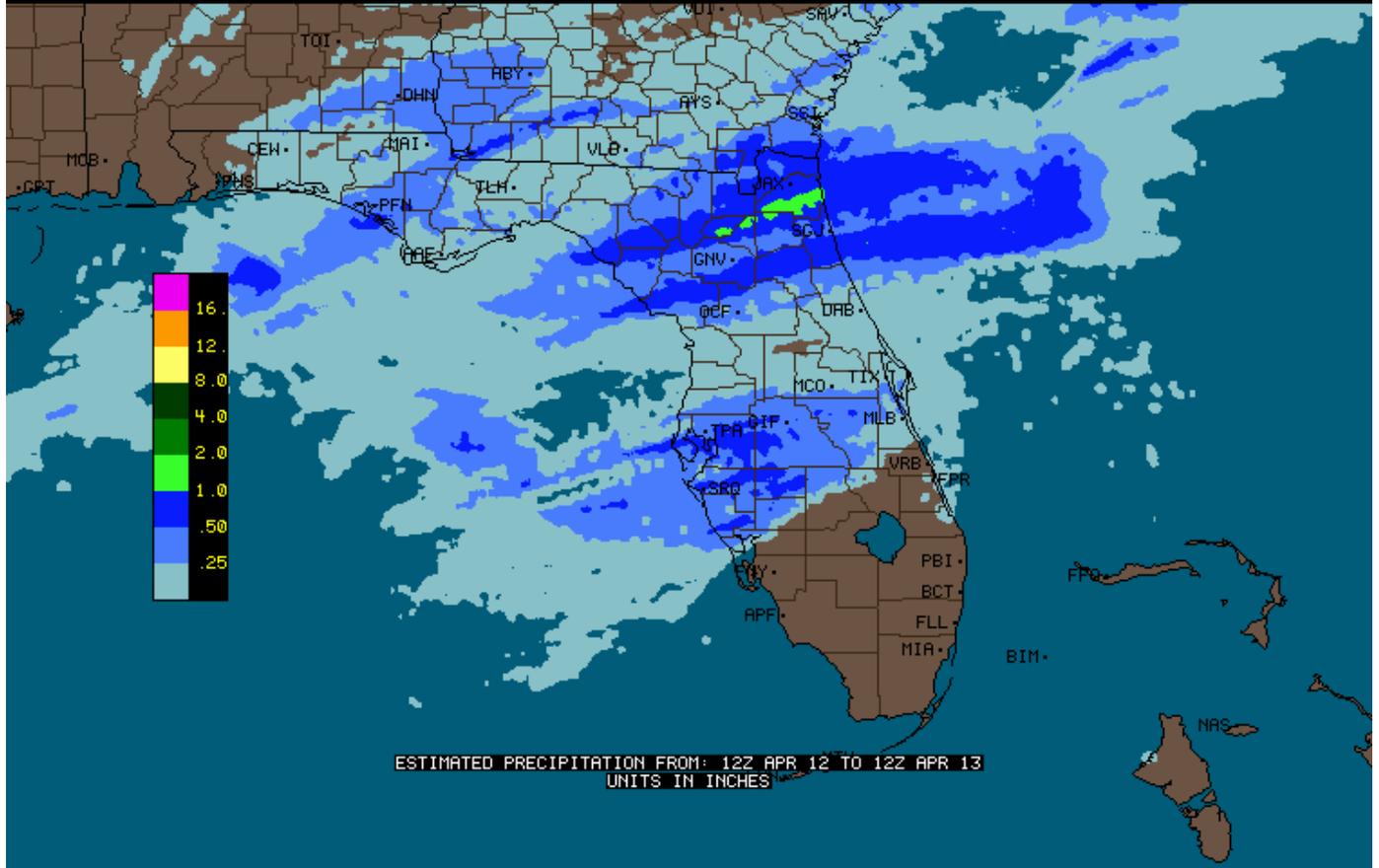
<b>Mesh Size</b>	<b>Particle Size</b>	<b>Amount Collected</b>
#6 mesh & greater	< 3.40 millimeters	0.0 grams
#20 mesh	< .86 millimeters	0.0 grams
#40 mesh	< .38 millimeters	0.0 grams
#100 mesh	< .15 millimeters	0.0 grams

**Total amount of sand collected: 0.0 grams**

**Conclusion:**

Based on the parameters of the experimentation and resulting data, the efficiency of the Nutrient Separating Baffle Box to capture sedimentation ranging from .125 mm to 2.0 mm is close to 100%. Data retrieved from Test #1 and Test #2 are from consecutive rain events showing no significant re-suspension of captured sedimentation.

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