

EFA Soil Samples
Cherokee Co.
Road S-348

Tube Labeled: Sample #3 (Upstream Floodplain)

Preliminary Remarks:

Again, the available sample length was approximately 26 inches. That sample was divided into three sections:

Section 3A ...0.0 to 10.0 inches
Section 3B ...10.0 to 20.0 inches
Section 3C ...20.0 to 26.0 inches

Due to the limitations of the soil extractor, a 10 inch sample is about the maximum length that could be tested. Each section will be subjected to a series of flow velocities. Each flow rate had a time duration of 1 hour or a total erosion amount of 50 millimeters.

The logging rate parameter of the "Erosion" program was set to 1 second. This logging rate will be the same for all of the following tests.

NOTE: Due to the clayey nature of the material in tube "Sample #3", testing will begin at a flow velocity of 1.0 m / sec.

For sample designated 3A: (0.0 to 10.0 inches)

Soil Description: Reddish-Brown Silty Clay Loam w/ Sand Loam pockets.

Test #3A-1
File name Tube3A Run1.txt
Velocity 1.0 m / sec
Total push 1 mm
Test duration 1 hour

Remarks: Small isolated scour holes developed when Sand pockets eroded.

Trim 25 mm

Test #3A-2
File name Tube3A Run2.txt
Velocity 1.5 m / sec
Total push 3 mm
Test duration 1 hour

Remarks: After trimming, Sand pockets were visible. These pockets scoured-out very quickly. The resulting holes did not deepen and did not contribute to the erosion of the remaining clayey material. Small roots were visible also.

Trim 25 mm

Test #3A-3

File name Tube3A Run3.txt

Velocity 2.0 m / sec

Total push 64 mm

Test duration 0.211 hours

Remarks: Soil matrix was sandier. The material scoured to a depth of 2.5 inches in 12.5 minutes. Machine push rate could not keep pace. Scouring slowed dramatically when a more clayey material was exposed. Operator stopped the test due to the change in soil type.

Trim 25 mm

Test #3A-3 RE-RUN

File name Tube3A Re-Run3.txt

Velocity 2.0 m / sec

Total push 10 mm

Test duration 0.423 hours

Remarks: Sample was stable for 20 minutes until a scour hole opened-up on the back side of the flow. The hole quickly enlarged and then deepened to a depth of 1.5 inches. The test was stopped after 24 minutes.

Trim 50 mm

Test #3A-4

File name Tube3A Run4.txt

Velocity 2.5 m / sec

Total push 37 mm

Test duration 0.273 hours

Remarks: The sample exhibited a fairly steady scour rate for the first 9 minutes of the test. A scour hole began to form on the back side of the flow. At 13 minutes the hole had enlarged to the full diameter of the tube. The depth of the hole was about 0.5 inches. The machine push rate could not keep pace with the resulting erosion. The remaining 1 inch of material lifted out of the tube at about 16 minutes into the test. Test was terminated.

Testing Terminated on Section 3A

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For Sample designated 3B: (10.0 to 20.0 inches)

Soil Description: Reddish-Brown Silty Clay w/ Sand Loam pockets

Test #3B-1

File name Tube3B Run1.txt

Velocity 1.0 m / sec

Total push 1 mm

Test duration 1 hour

Remarks: Little to no visible scour.

Trim 6 mm

Test #3B-2

File name Tube3B Run2.txt

Velocity 1.5 m / sec

Total push 1 mm

Test duration 1 hour

Remarks: Small to medium sized holes developed quickly due to the erosion of sandy pockets. These holes did not enlarge during the remainder of the test.

Trim 50 mm ...Numerous sticks and roots required excessive trimming.

Test #3B-3

File name Tube3B Run3.txt

Velocity 2.0 m / sec

Total push 40 mm

Test duration 1 hour

Remarks: Rate of erosion was fast at first. 20 mm eroded in 9.5 minutes. A small zone of root structure slowed the erosion rate. Only 10 mm were pushed in the following 44 minutes. The root zone finally eroded away and 10 mm had to be pushed to fill the resulting void.

Trim 25 mm

Test #3B-4

File name Tube3B Run4.txt

Velocity 2.5 m / sec

Total push 50 mm

Test duration 0.380 hours

Remarks: Sample was stable for 3.5 minutes. A large portion of material lifted out. 23 mm were pushed to fill the void. The sample was stable until the 8.5

minute mark when another large portion of sample lifted out. 13 mm were pushed this time to fill the void. The sample was stable once again until the 21.5 minute mark when yet another large portion lifted out. Material was pushed to the maximum amount of 50 mm to fill void. Test was terminated.

NOTE: The remaining 3 inches of material was not deemed suitable for further testing at a flow velocity of 3.0 m / sec. The soil matrix was more sandy. The very bottom was more clayey but probably would have lifted out of the tube due to high water velocity.

Testing Terminated on Section 3B

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For Sample Designated 3C: (20.0 to 26.0 inches)

Soil Description: Tan to Brown Silty Clay

Test #3C-1
File name Tube3C Run1.txt
Velocity 1.0 m / sec
Total push 1 mm
Test duration 1 hour

Remarks: No noticeable erosion.

Trim 6 mm

Test #3C-2
File name Tube3C Run2.txt
Velocity 1.5 m / sec
Total push 1 mm
Test duration 1 hour

Remarks: Little to no erosion.

Trim 6 mm

Test #3C-3
File name Tube3C Run3.txt
Velocity 2.0 m / sec
Total push 5 mm
Test duration 1 hour

Remarks: Slow rate of erosion.

Trim 6 mm

Test #3C-4
File name Tube3C Run4.txt
Velocity 2.5 m / sec
Total push 50 mm
Test duration 0.856 hours

Remarks: Uniform erosion.

Trim 6 mm

Test #3C-5
File name Tube3C Run5.txt
Velocity 3.0 m / sec
Total push 24 mm
Test duration 0.213 hours

Remarks: Uniform erosion rate for 12.8 minutes. The bottom 2 inches began to lift out of the tube. The test had to be terminated.

End of Testing for Tube Labeled “ Sample #3 “ (Upstream Floodplain)