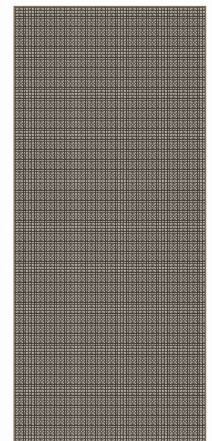


SUSTAINABLE BIORETENTION MEDIA STUDY

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PROJECT BASIS

- Background
 - Bioretention Soil is 60-75% Sand
 - Source = “River” Sand
 - Sand cost = \$8-12/ton
 - MSD Cost of Ash Disposal
- MSD Lemay WWTP incinerates biosolids, creates ash
 - “Ash” = Non-hazardous
 - Silica (sand), Aluminum (trace), Iron (trace)
 - Particle size: relatively small % fines

RESEARCH OBJECTIVE

- Could Lemay ash replace river sand in bioretention media?
 - Hydraulic Conductivity?
 - Export of Nutrients & Metals?
 - Plant Compatibility?
 - Permitting Requirements?
 - Lemay Modifications?
- This Project
 - Focus = Hydraulic Conductivity

MATRIX

Set	Mixed Medium	Columns
A	75% Sand 25% Compost (Control)	1-3
B	75% Bottom Ash 25% Compost	4-6
C	50% Bottom Ash 50% Compost	7-9
D	75% Bottom Ash 25% Mulch Fines	10-12
E	50% Bottom Ash 50% Mulch Fines	13-15

METHODS (1 OF 3)



Column Fabrication

- PVC pipe
- window screen
- 6" pea gravel
- geotextile fabric
- 18" mixed medium

METHODS (2 OF 3)



METHODS (2 OF 3)

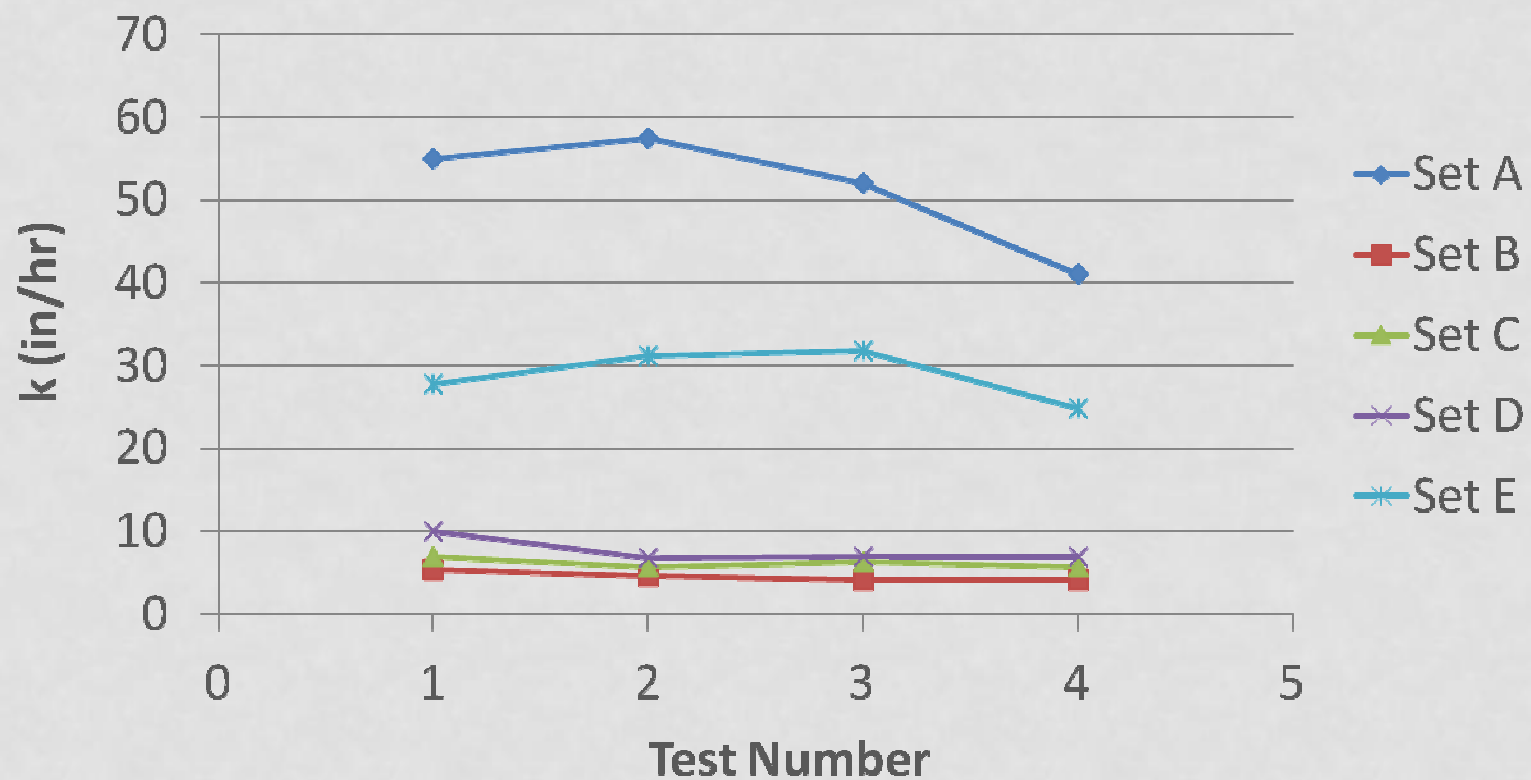


RESULTS (1 OF 3)

Test	Average k (in/hr)				
	A Sand:Compost 75:25	B Ash:Compost 75:25	C Ash:Compost 50:50	D Ash:Mulch 75:25	E Ash:Mulch 50:50
1	54.91 ± 7.23	5.42 ± 0.58	6.94 ± 0.64	9.92 ± 1.53	27.74 ± 3.23
2	57.35 ± 7.23	4.55 ± 0.58	5.58 ± 0.64	6.82 ± 1.53	31.16 ± 3.23
3	51.99 ± 7.23	4.19 ± 0.58	6.23 ± 0.64	6.91 ± 1.53	31.83 ± 3.23
4	40.97 ± 7.23	4.19 ± 0.58	5.61 ± 0.64	6.87 ± 1.53	24.87 ± 3.23

RESULTS (2 OF 3)

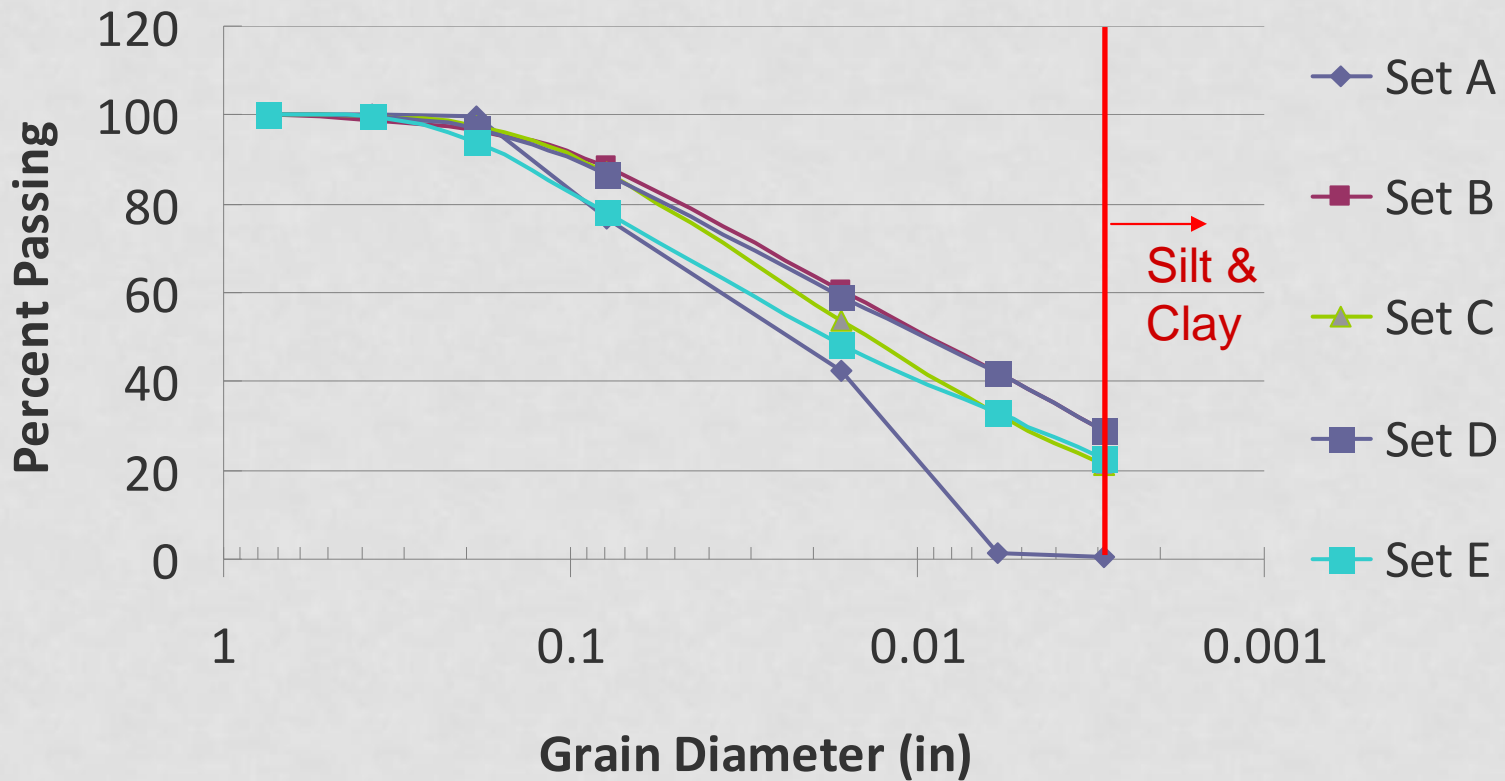
Hydraulic Conductivity vs. Test Number



RESULTS (3 OF 3)

Grain-size Distribution Curve

Average of Top, Middle, & Bottom 6" for Each Set



CONCLUSION & FUTURE WORK

- Hydraulic Conductivity
 - >1 in/hr (2 ft/day) met
 - Conclusion: ash mix could be acceptable
 - Most Promising Mix 50% ash : 50 % mulch
- Future Research
 - Plant compatibility
 - Nutrient/metals export



QUESTIONS



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