



# Clean Drinking Water Technology

Antonio Lara, Ph.D.

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Clean Drinking Water team from NMSU

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Nhat Nguyen

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The logo for New Mexico State University, featuring the letters "NM" stacked above "STATE" in a white serif font, enclosed within a white outline of the state of New Mexico. The entire logo is set against a dark maroon background.

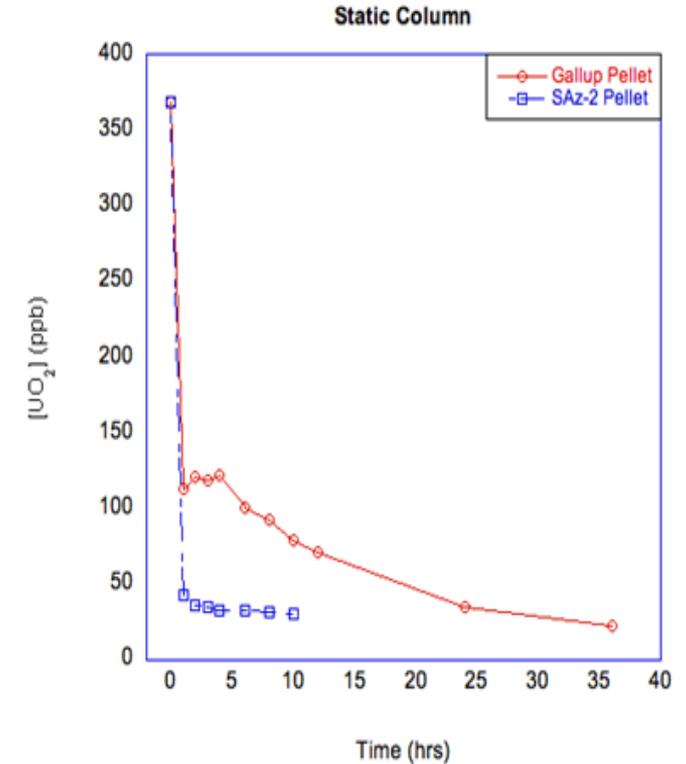
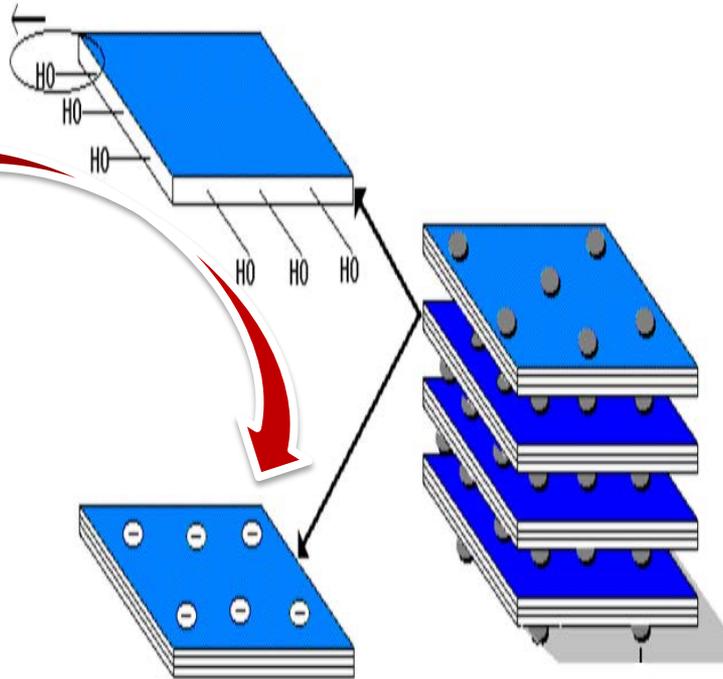
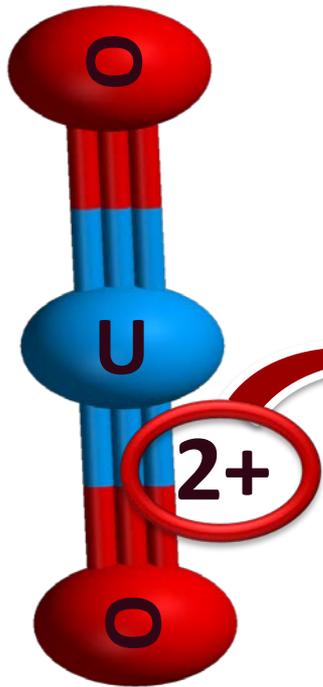
NM  
STATE

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# Proof of-Concept

## Sequestration



**Clay – Best Candidate or What’s in your back yard!**

NM  
STATE

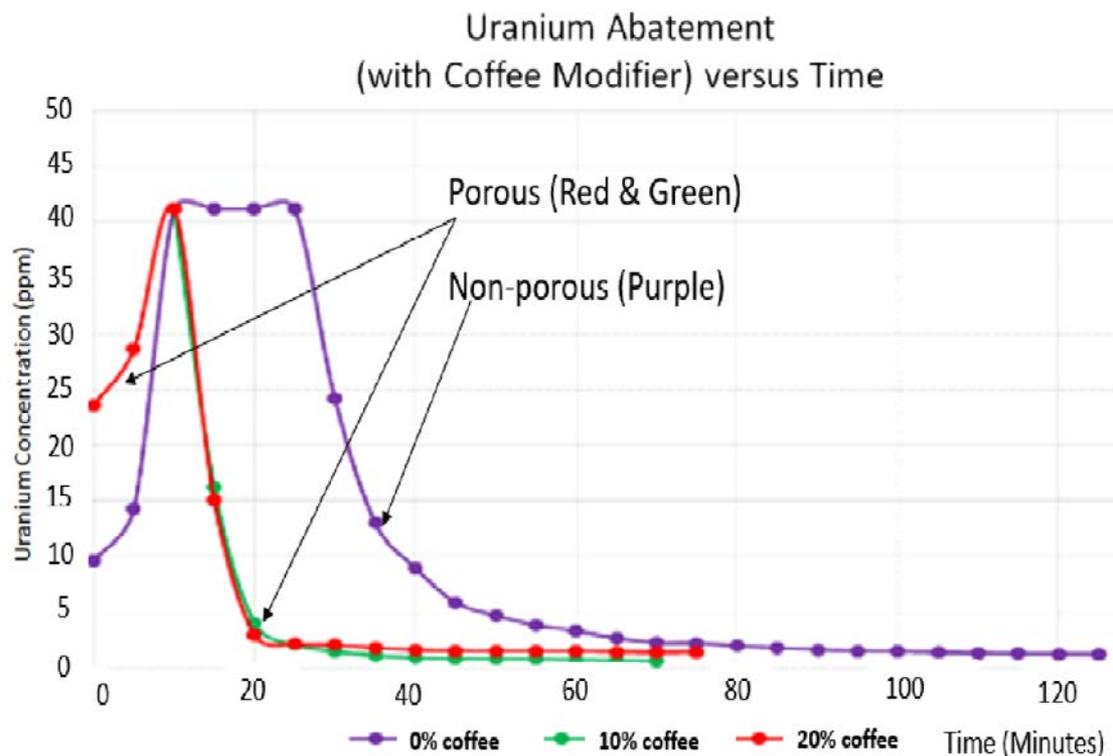
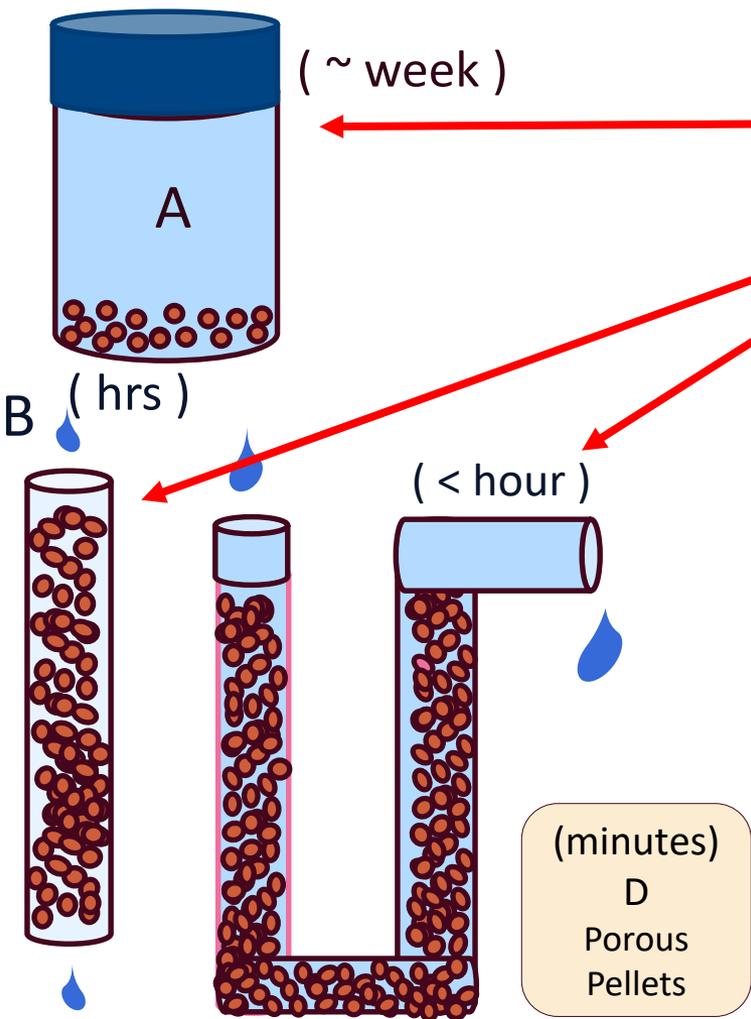
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## Kinetics - rate of sorbing uranium

1 diffusion in the water

2 diffusion in the pellet

Uranium, heavy metals, pathogens



(Sites, q/100 g clay)

Arizona (112)

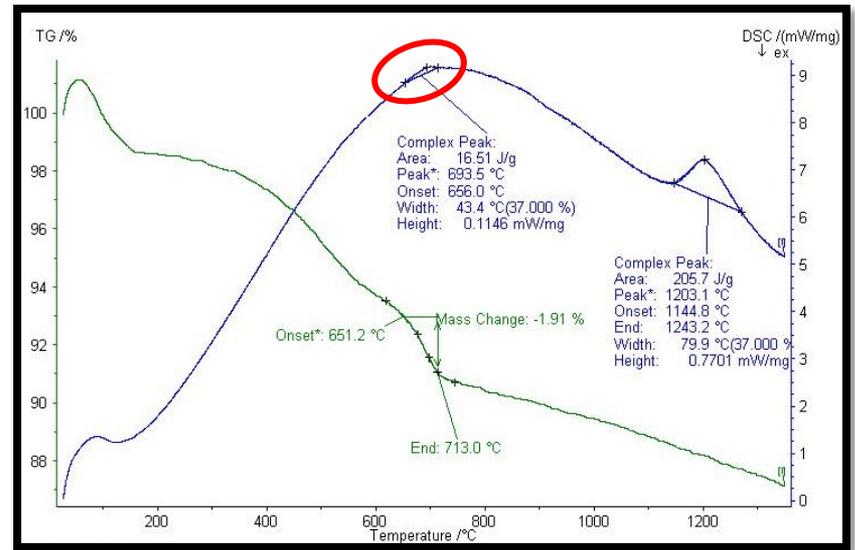
Texas (85)

Wyoming (76)

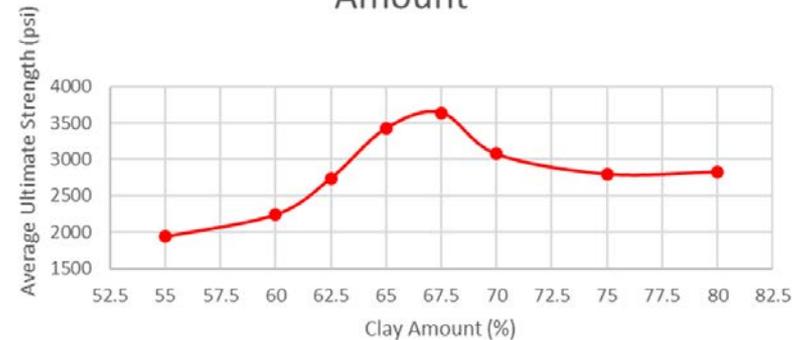
Berino (46)

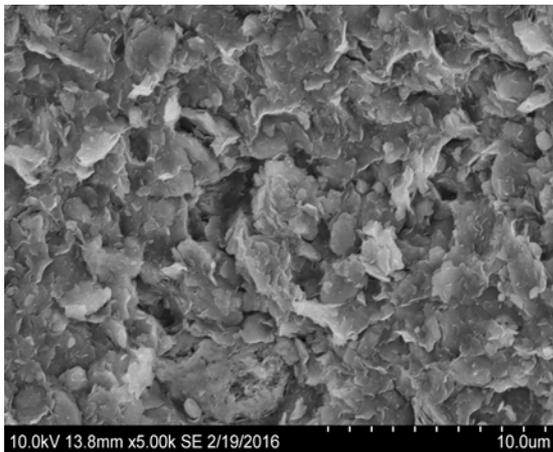
Gallup (39)

But . . .

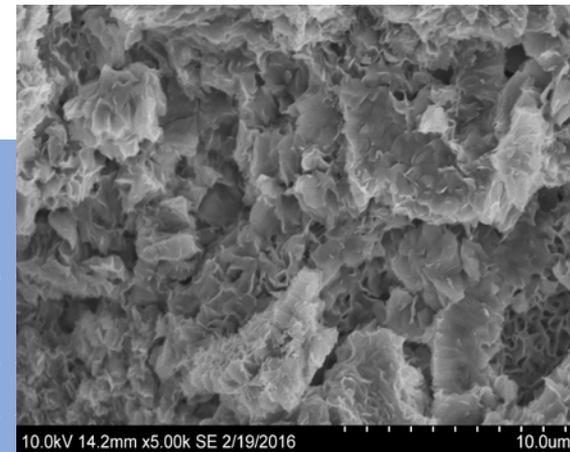
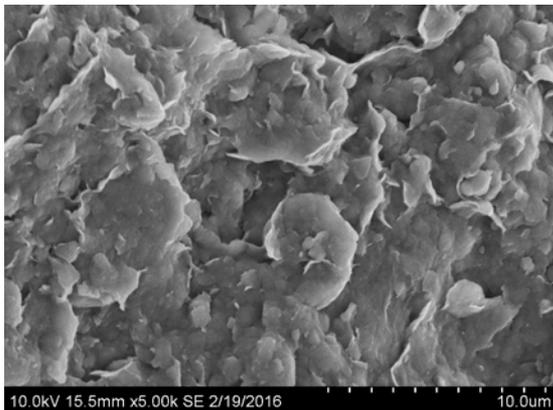


Unrefined Gallup Clay: Non-Porous  
Compression Pellets  
Average Ultimate Strength vs. Clay  
Amount

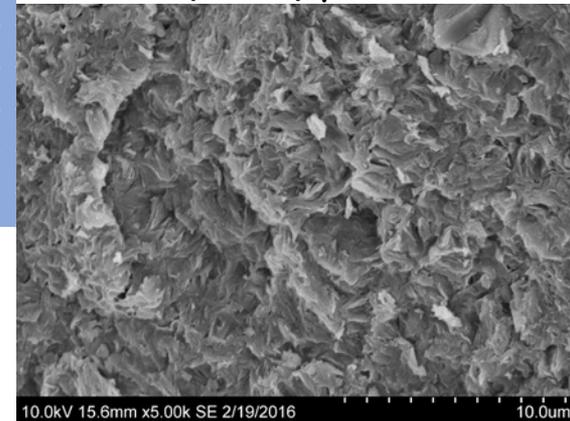




Gallup Clay Powder - Top  
 Gallup Clay Pellet -Bottom  
 Gallup Platelet Size  
 (0.5 – 2.5)  $\mu\text{m}$



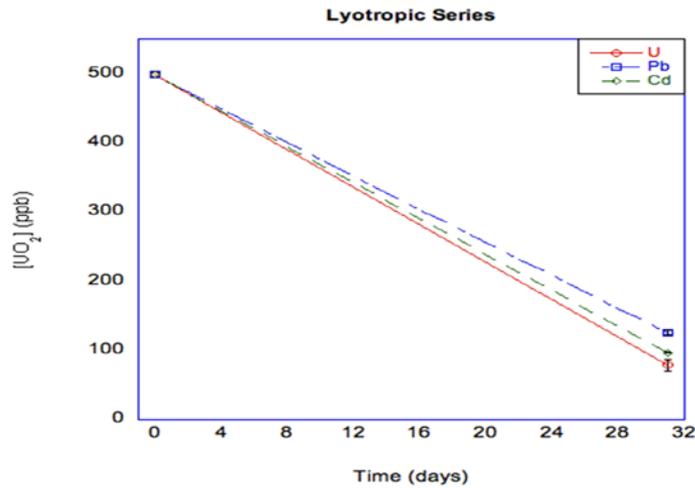
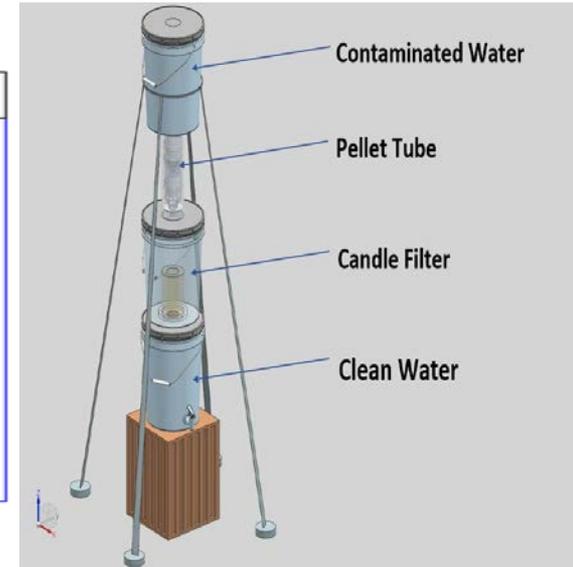
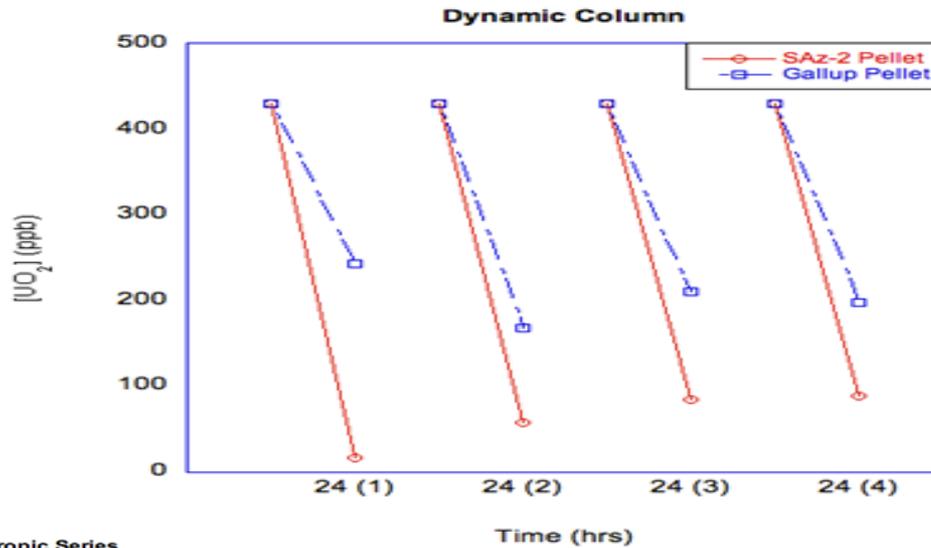
Arizona Clay Powder - Top  
 Arizona Clay Pellet - Bottom  
 Arizona platelet size  
 (1 – 5)  $\mu\text{m}$



	Platelet Size (nm)				Zeta potential (mV)			Conductivity (mS)		
	6 min	12 min	18 min	24 hour	clay DD water	clay salt water	5-day dialysis	clay DD water	clay salt water	5-day dialysis
Clay										
Arizona	4269	3014	3217	1045	-23	-20		0.0058	49.2	
Texas	2577	1413	1391	641	-37	-21		0.0221	50.2	
Berino	1109	1036	998	756	-19	-22		0.0302	50.1	
Gallup	1379	2597	884	546	-19	-22	-10	0.0305	50.2	0.24
Wyoming	823	833	753	421	-49	-25		0.0384	49.9	



# Capacity



All Heavy Metals

... and pathogens

