

1 **Supporting Information for:**

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3 **Title: Partitioning of Naturally-Occurring Radionuclides (NORM) in Marcellus**
4 **Shale Produced Fluids Influenced by Chemical Matrix**

5

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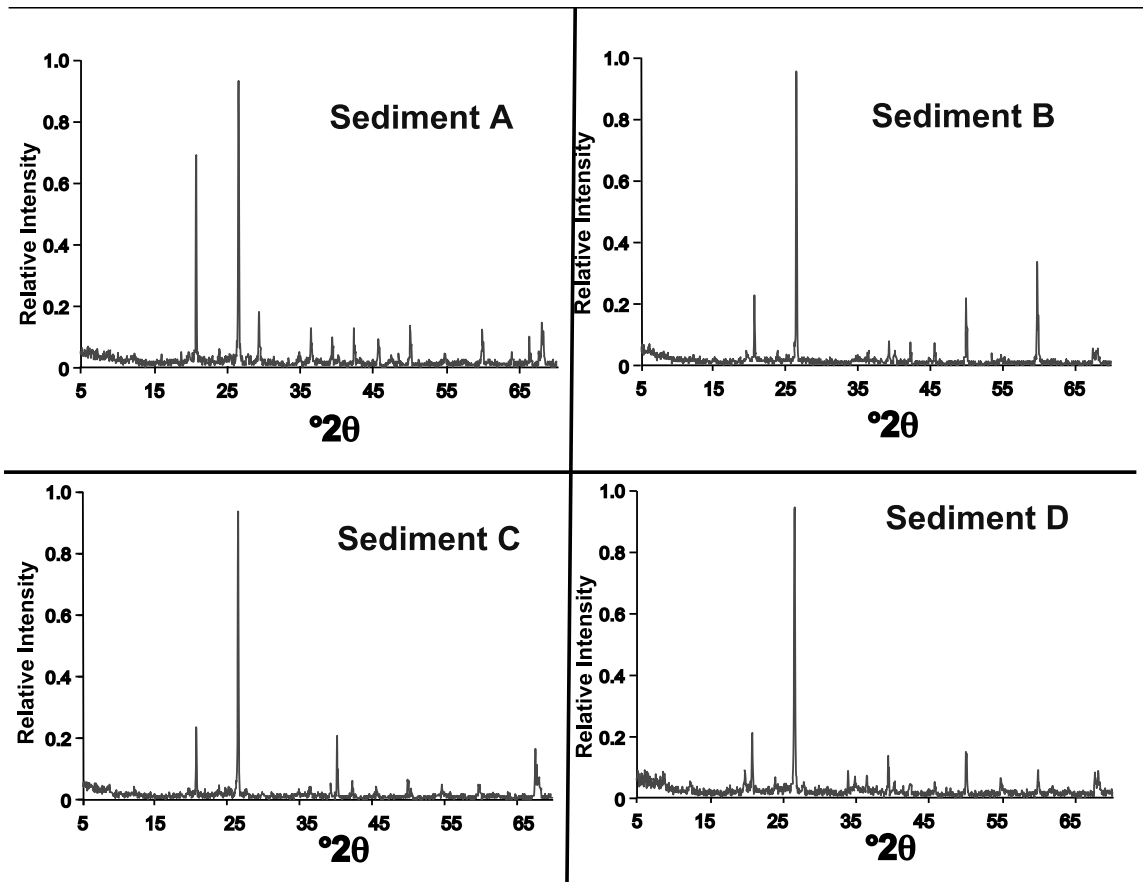
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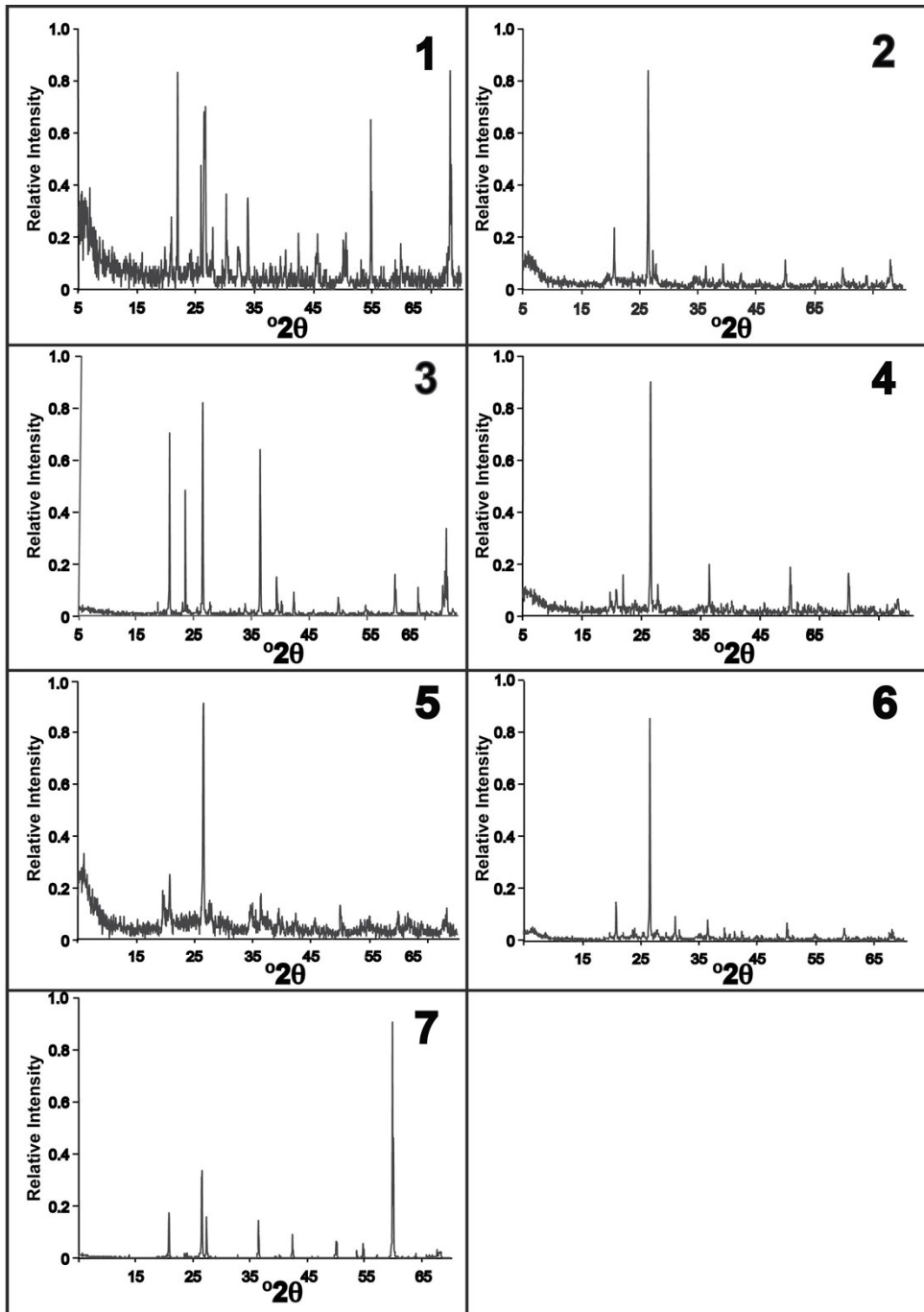
18 • **Supplementary Reference**

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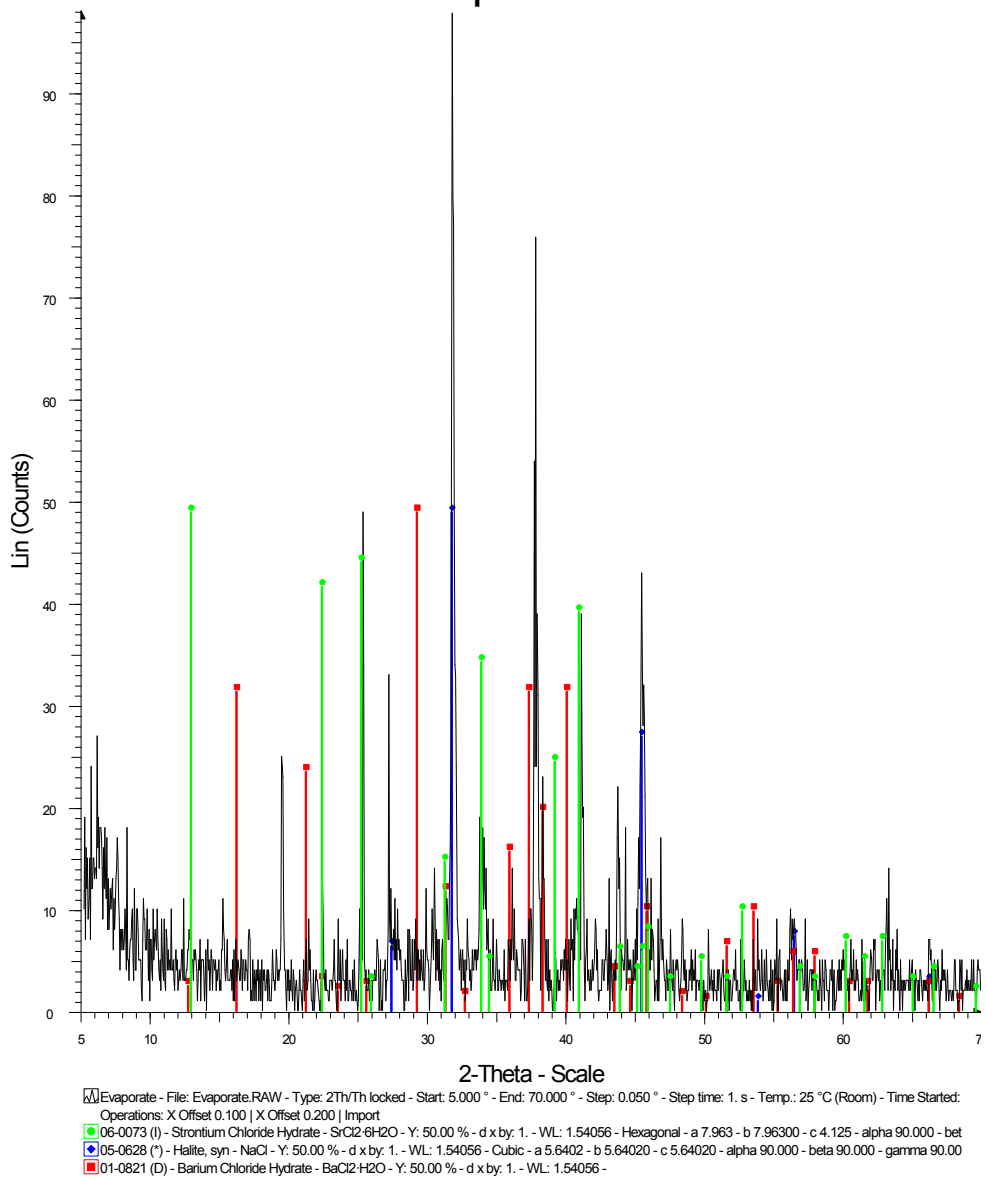


21
22 Fig. S1. PXRD spectra for select sediments in Dunkard Creek.
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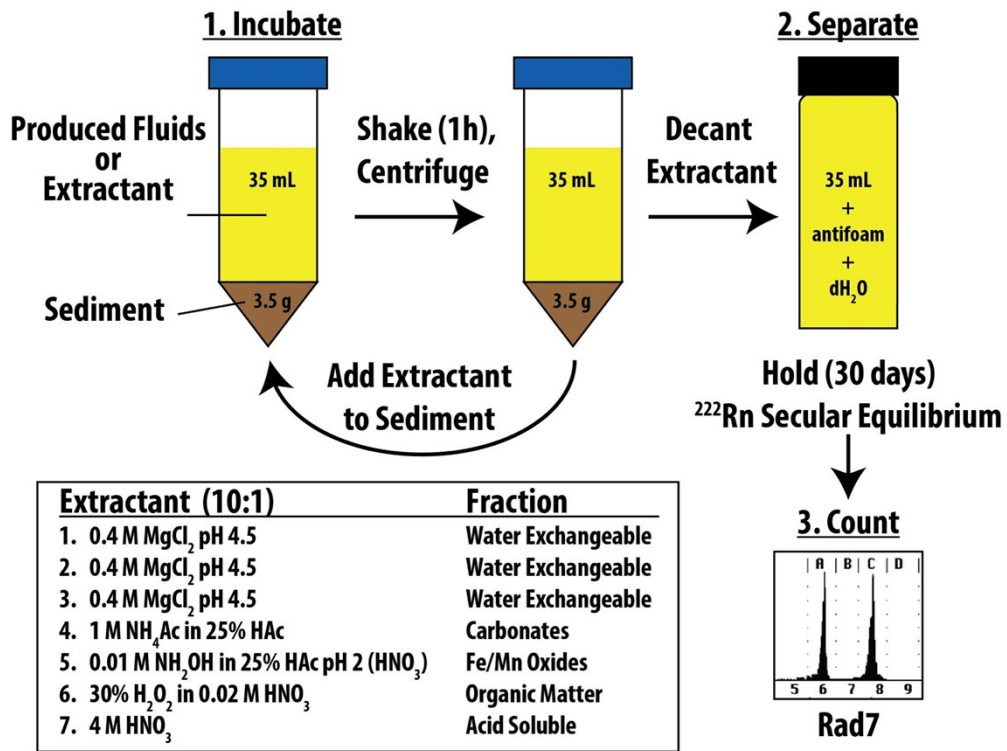


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 25 Fig. S2 PXRD of sediments from Quaternary Materials Laboratory at the University
 26 of Iowa.
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Evaporate



28
29 Figure S3. PXRD spectra of Marcellus Shale produced fluid evaporites.



30 Fig. S4. General workflow for sequential extractions.
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Table S1. Supplementary PXRD information for akaganeite. ¹	
$^{\circ}2\theta$	(h,k,l)
11.8	(-1,0,1) (1,0,1)
16.7	(2,0,0)
26.7	(-1,0,3)
35.2	(1,1,2)
39.2	(3,1,0)
46.1	(4,1,1)
56.1	(2,1,5)

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33 **Supplementary Reference**

- 34 1. J. E. Post, and V. F. Buchwald, Crystal structure refinement of akaganeite,
 35 *American Mineralogist*, 1991, **76**, 272-277.