



SRNL-L3100-2009-00087, Rev. 0

April 7, 2009

To: J. E. Occhipinti, 704-S
D. C. Sherburne, 704-S
A. V. Staub, 704-Z
F. M. Smith, 705-1C
D. A. Crowley, SRNL
C. A. Langton, SRNL

CC: S. L. Marra, SRNL
A. B. Barnes, SRNL
A. D. Cozzi, SRNL
J. A. Harbour, SRNL

From: E. K. Hansen, SRNL
C. A. Crawford, SRNL

A handwritten signature in black ink, appearing to read "E.K.H.", is written over the "From:" line.

Pictures of Vault 4 Core Samples – Transfer of Samples At SRNL – April 6, 2009

The vault 4 samples, which were obtained from Saltstone in September 2008 and transferred to SRNL have been stored in room C114. The core samples were transferred from their original stainless containers into transparent PVC containers on April 6, 2009. A history of the vault 4 coring operations is described by Smith.¹ The locations of the core samples in vault 4, cell E are shown in Figure 1.¹ The cores samples are identified using two numbers, A-B, where A denotes the port location of coring and B is the core ID (sequence) of sampling at that location, and the higher the B value, the deeper the cored sample. A description of the cores, during the coring operations is provided in Table 1.¹

The cored samples were removed from their original stainless steel containers, placed on a towel and picture(s) were obtained, and the sample (including most of the pieces) was immediately transferred into their new transparent PVC containers. Once the samples were placed into their new containers, the atmosphere inside the container was purged with nitrogen and isolated. This evolution took at most 2 minutes or less to complete. In all cases, other than for sample 2-2, a vacuum was present during the process of removing the samples from their original stainless steel containers. A piece of sample 3-2 was hard to remove from the original container and could not be placed into a PVC container hence it was placed into a plastic bag. Samples contained in the core bits (a total of two) could not be removed and only one of the core bits could be placed into a PVC container. The other core bit was too large for the PVC container and was placed back into a plastic bag and sealed. Pictures of the samples are provided

¹ Smith, F. M., "Saltstone Sampling Summary for September 2008", LWO-RIP-2008-00006, Rev. 0, November 4, 2008

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in Figure 3 through Figure 16. Samples from port location 3 (furthest from the wall) were the most cylindrically shaped whole cored samples and as the depth of coring increased, so did the color of the sample. Samples placed in only plastic bags (e.g. the drill bit samples) seems to be much lighter in color as compared to the samples placed in the stainless steel containers, indicating the samples could be drying or oxidizing. In general, coring lines are obvious on all samples, e.g. the sides of the cored samples are not smooth.

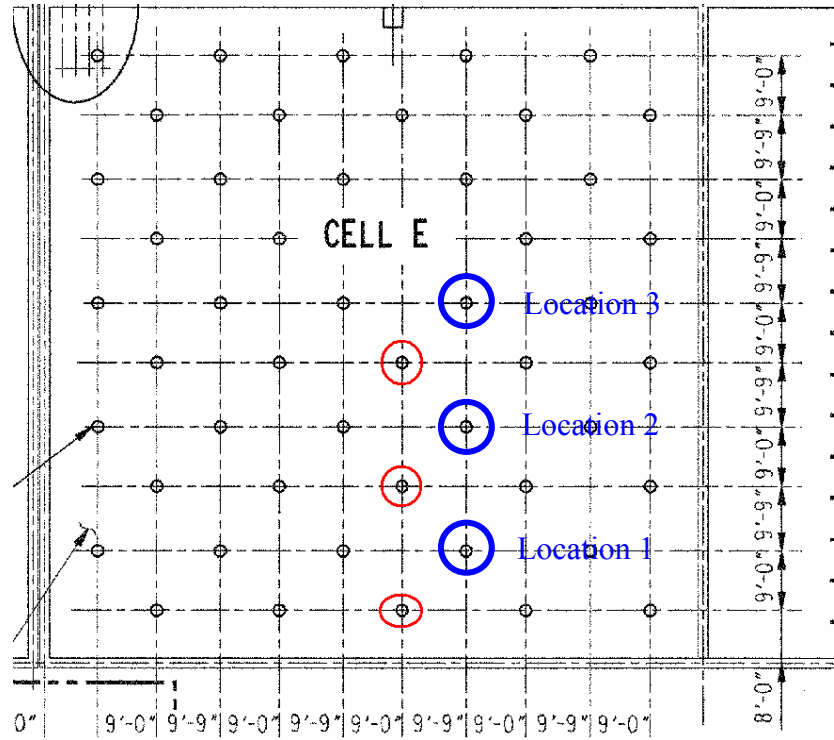


Figure 1 Vault 4, Cell E Coring Locations, Blue Circles are Actual Core Locations

Table 1: Saltstone Core Sample Collection Summary Data, September 2008

Core ID		Collection Date	Core Depth (in)	Core Conditions			Sample Collection Notes
Port Location	Core ID		Length (in)	Drilling Conditions	Color	Consistency	
1	1	16-Sep-08	0-4	2	Dry	Teal	Soft / Muddy / Crumbly ▶ Material smeared on the drill bit ▶ Humid Day ▶ Moisture observed inside glove bag
1	2	16-Sep-08	4-10	6	Dry	Teal	Sample is stuck hard within the drill bit
1	3	16-Sep-08	10-14	3 - 4	Wet*	Dark Teal	
2	1	17-Sep-08	0-6	2	Wet*	Dark Teal	4" worth of pieces
2	2	17-Sep-08	6-10	3	Wet*	Dark Teal	▶ 1" chunk ▶ Some pieces fell out of the bit during retrieval
2	3	17-Sep-08	10-14	4	Wet*	Dark Teal	
3	1	17-Sep-08	0-6	4	Dry**	Teal	▶ 2" worth of crumbly material ▶ Appeared similar to day old concrete with moisture (Mathison) ▶ Core location 3 was drilled easire than core location 1. Comparison to location 2 not valid since wet drill technique was used (drill crew)
3	2	17-Sep-08	6-13	6	Dry**	Olive Green	▶ Core broke into 2 pieces (4" and 2") ▶ Easily removed from the bit ▶ Core location 3 was drilled easire than core location 1. Comparison to location 2 not valid since wet drill technique was used (drill crew)
3	3	18-Sep-08	13-20	6	Dry**	Olive Green	▶ Easily removed from the bit ▶ Core location 3 was drilled easire than core location 1. Comparison to location 2 not valid since wet drill technique was used (drill crew)

* Wet technique used to facilitate sample removal from drill bit.

** Dry technique requested by SRNL regardless of ability to remove from drill bit.



Figure 2 Original Typical Stainless Steel Vault 4 Sample Container – Vent on left side of container



Figure 3 Typical Transparent PVC Holder in the Process of Being Purged with Nitrogen Gas Prior to Isolating the Sample



Figure 4 Sample 1-1, No Solid Cylindrical Pieces



Figure 5 Sample 1-2, No Solid Cylindrical Pieces



Figure 6 Sample 1-3, No Solid Cylindrical Pieces were Present – Looks Cylindrical, but is not

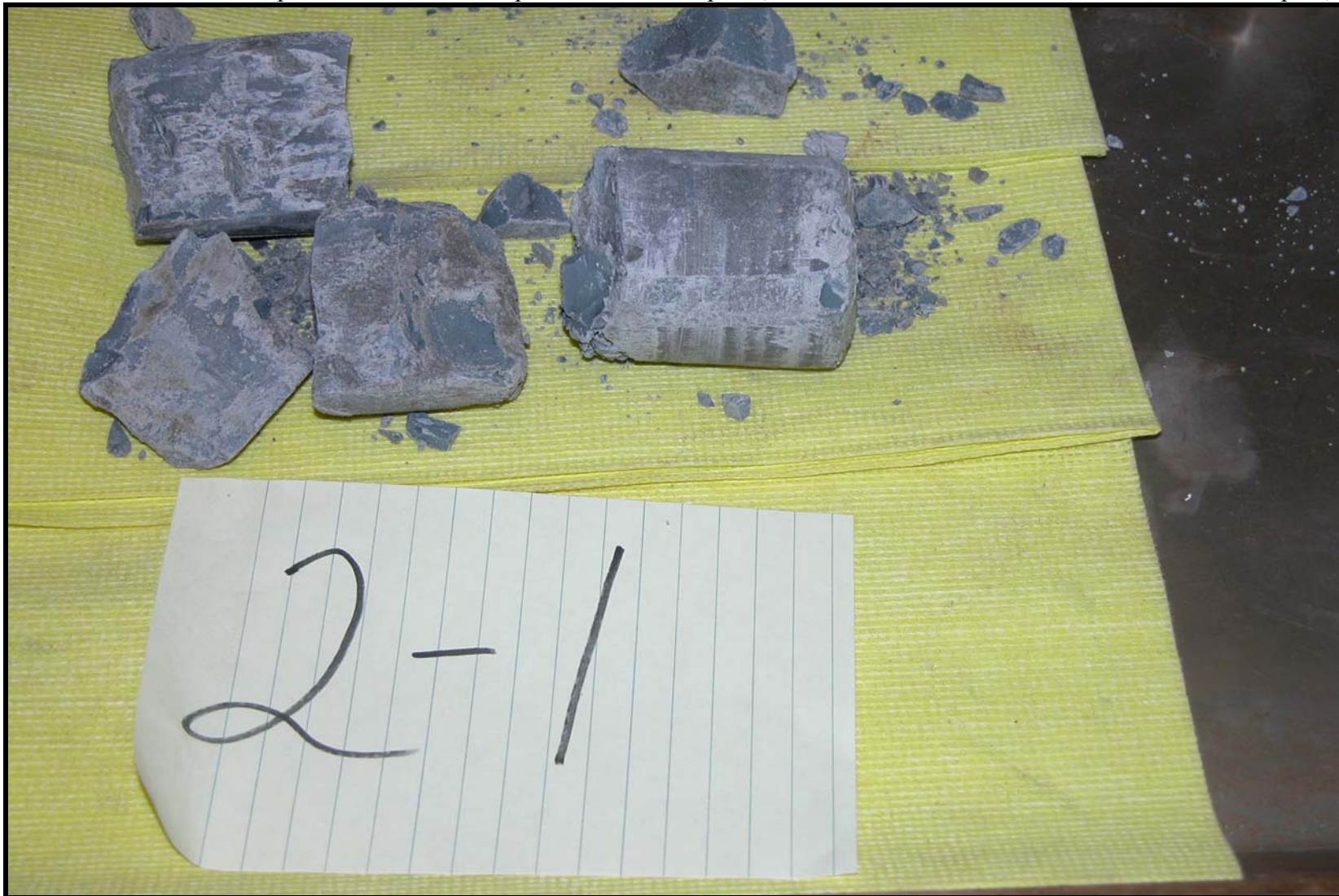


Figure 7 Sample 2-1, 2" Long Solid Cylindrical Piece (Piece on Right) and Others

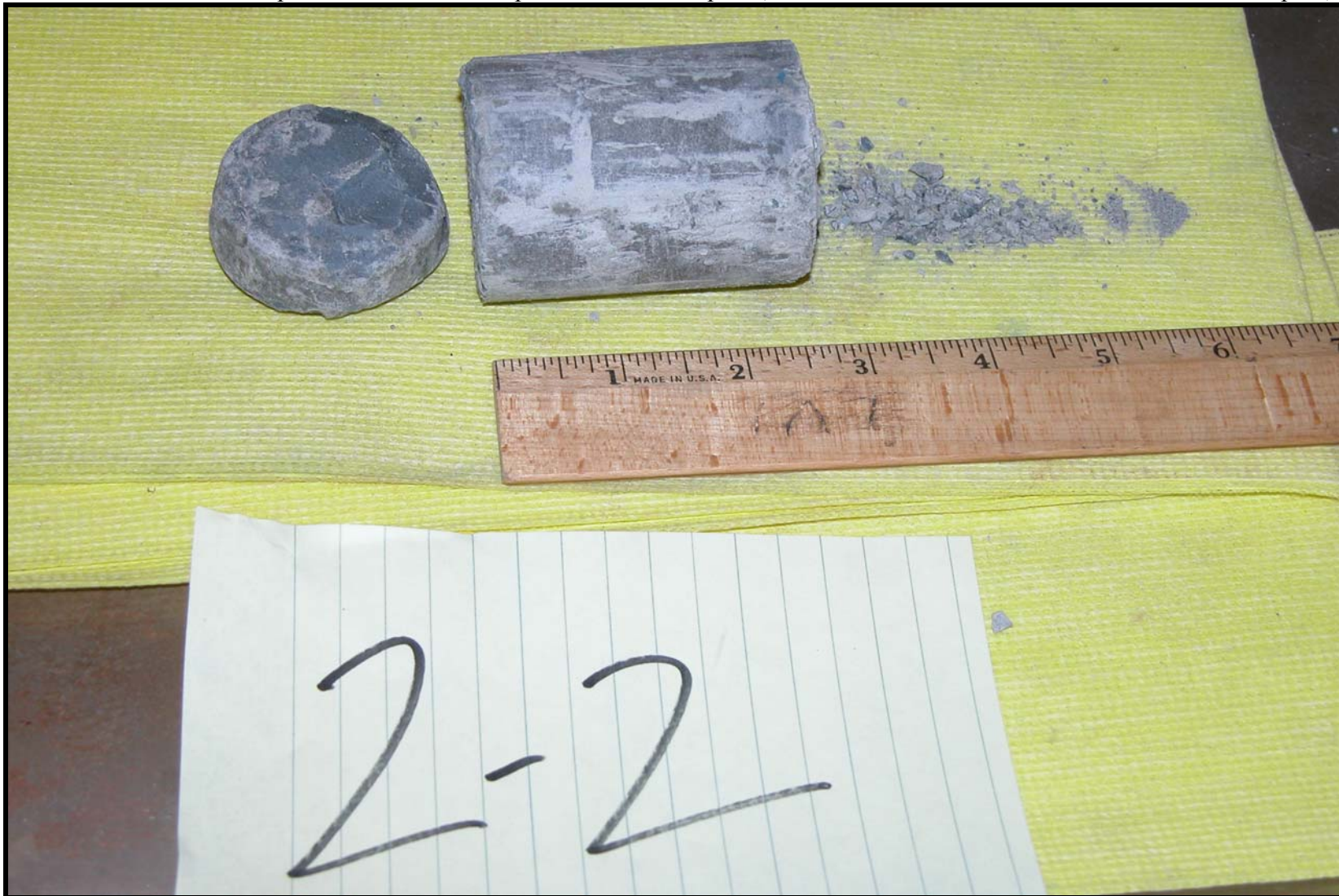


Figure 8 Sample 2-2, 2" Long Solid Cylindrical Piece (Piece on Right) and Other



Figure 9 Sample 2-3, 2" Long Solid Cylindrical Piece (Piece on left) and Crumbly Pieces



Figure 10 Sample 3-1, 6" Long Solid Cylindrical Piece

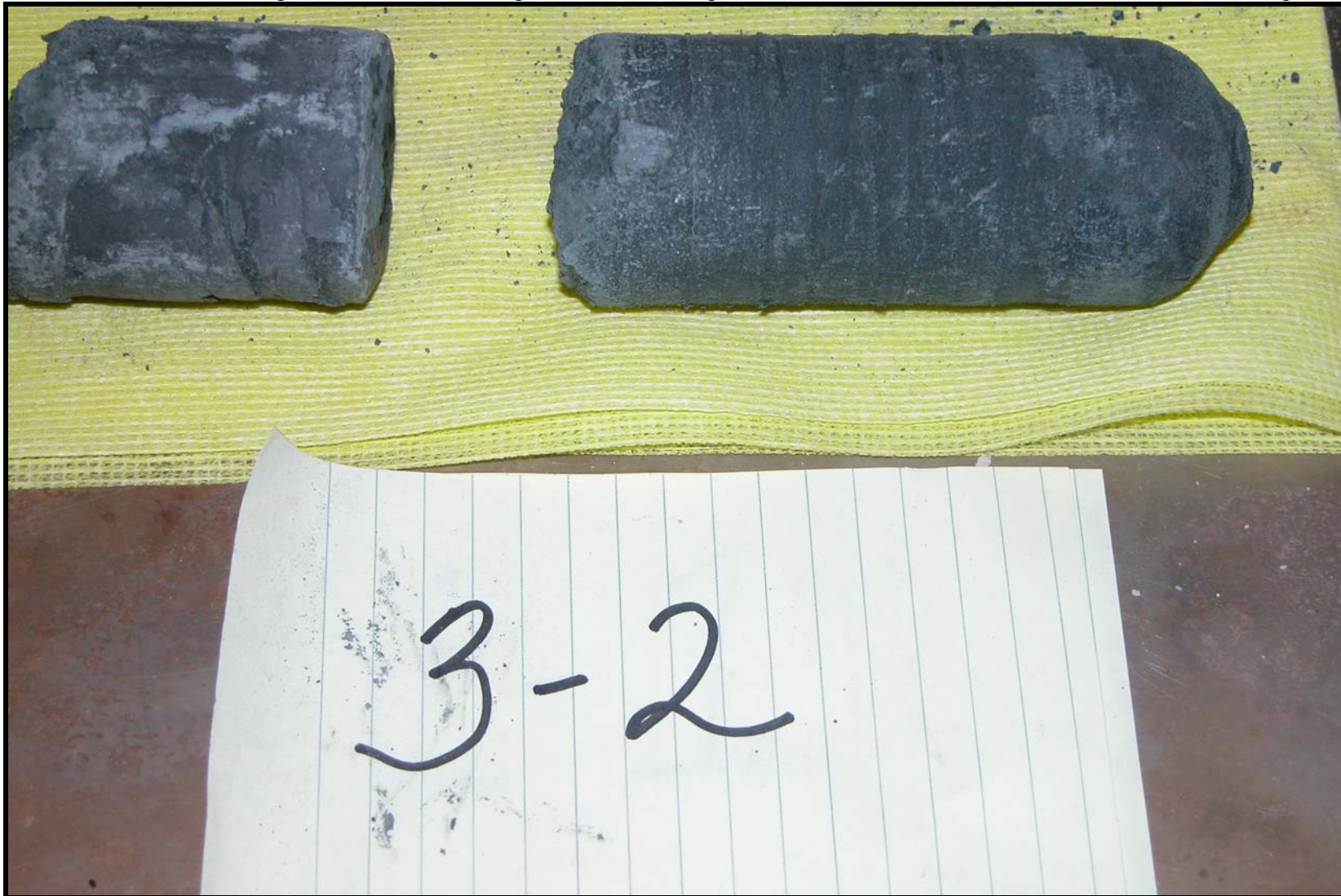


Figure 11 Sample 3-2, 5" Long Solid Cylindrical Piece (on Right) and 2" Piece (on Left) Was Hard To Remove

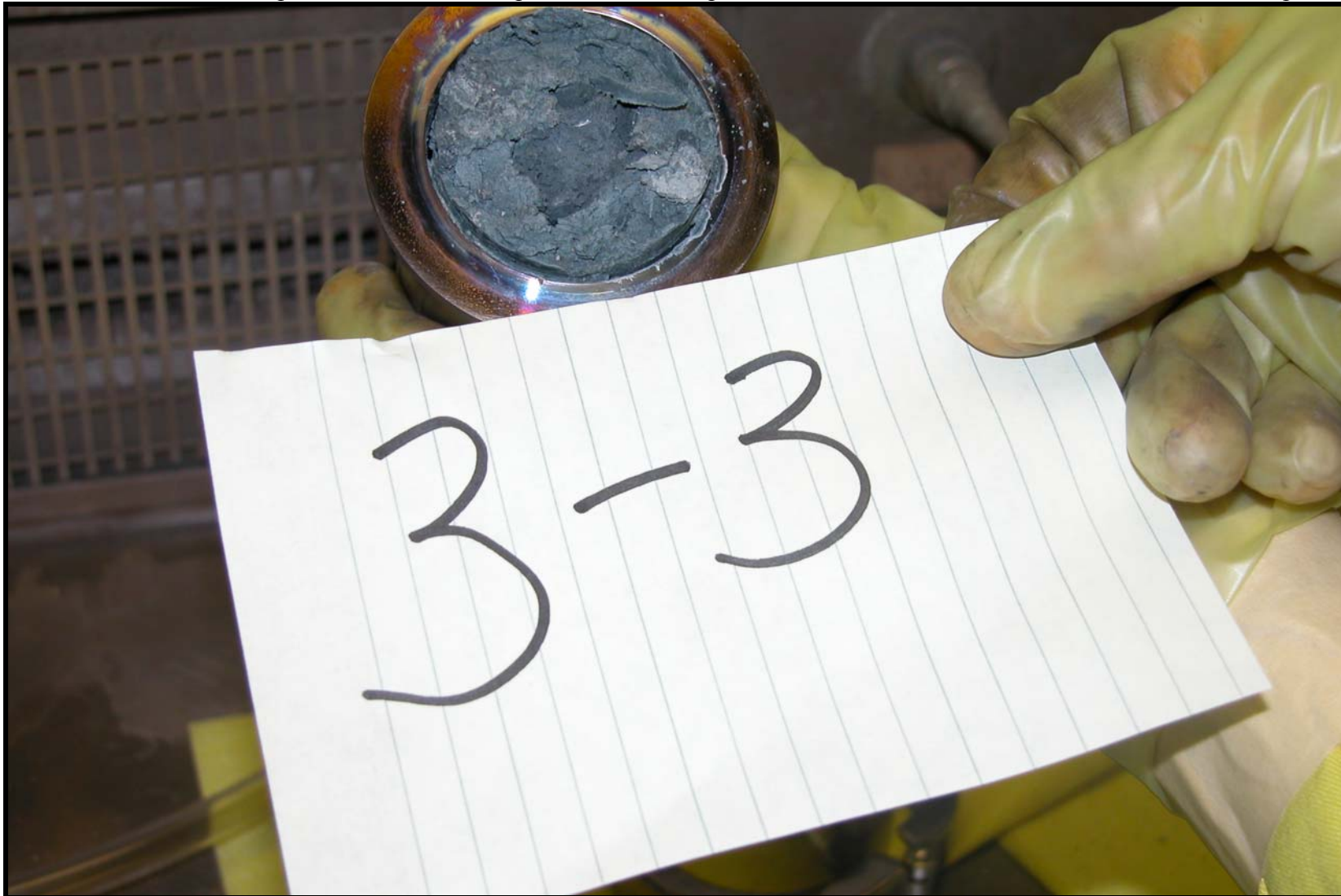


Figure 12 Sample 3-3, Prior To Sample Being Removed From Stainless Steel Container



Figure 13 Sample 3-3, 5.5" Long Solid Cylindrical Piece (on Right) and Crumbs



Figure 14 First of the Two Core Bit Samples



Figure 15 First of the Two Core Bit Samples – Sample Jammed in Bit

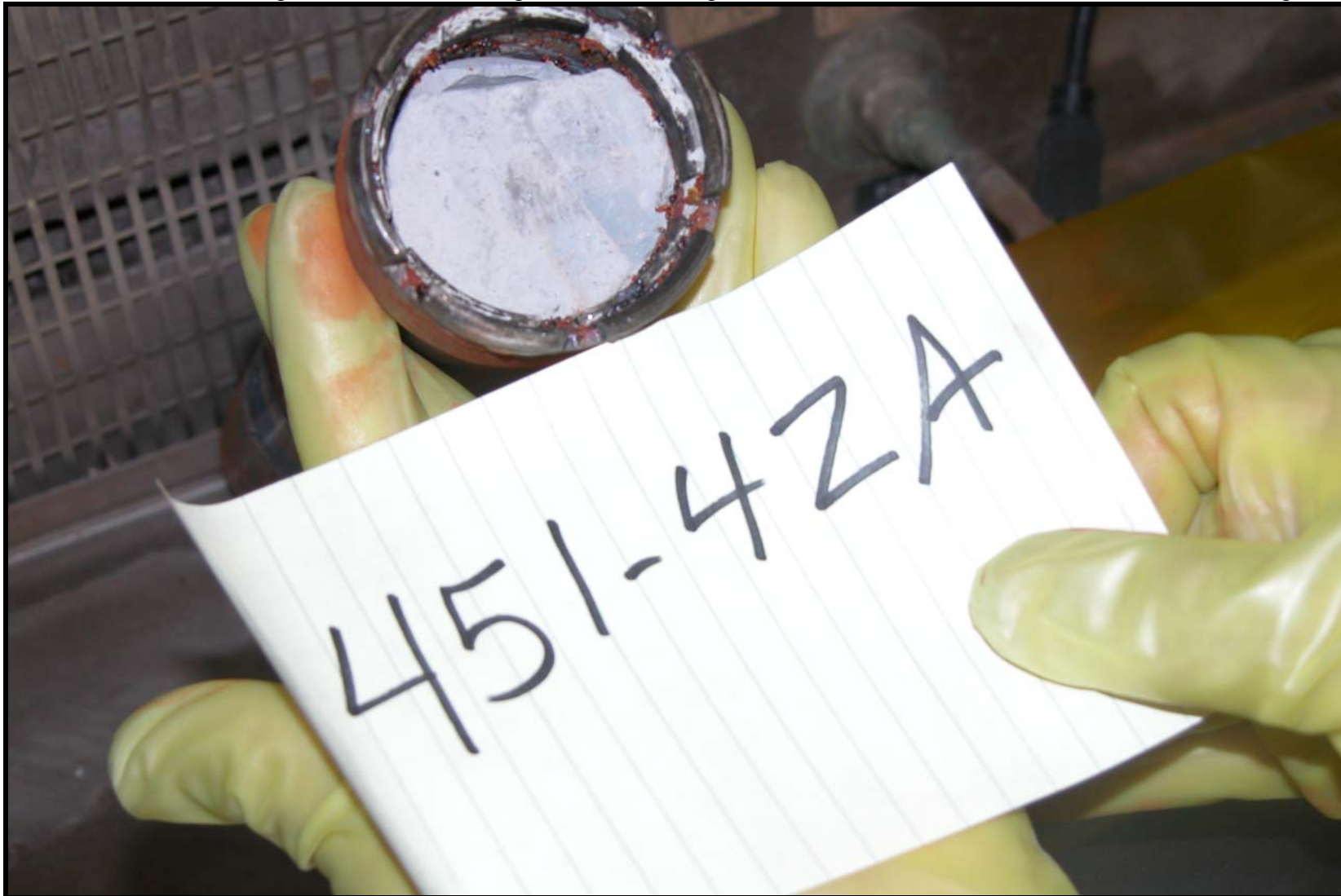


Figure 16 Second of the Two Core Bit Samples – Sample Jammed in Bit