

# APPENDIX

A

## APPENDIX A

### FIELD INVESTIGATION

The field investigation was performed in August 2021 and consisted of excavating eleven large-diameter borings and five continuous core borings. The locations of the borings were surveyed by Rick Engineering and are shown on the Geologic Map (Figure 1). The large-diameter borings were excavated to maximum depth of approximately 25 feet to 100 feet using a truck-mounted EZ Bore 120 drill rig equipped with a 30-inch diameter bucket-auger. The continuous core borings were performed with a CME-85 Mud Rotary drill rig. A representative of Geocon down-hole logged the large diameter borings. The cores were also logged, examined, and photographed by a representative of Geocon. Logs of the borings and cores are included herein. Also included are photographs of the cores.



DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	<b>BORING LB 1</b>		PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					ELEV. (MSL.) <u>217'</u>	DATE COMPLETED <u>08-10-2021</u>			
					EQUIPMENT <u>30" BUCKET AUGER</u> BY: <u>R. ADAMS</u>				
					MATERIAL DESCRIPTION				
0				ML&SM	<b>LANDSLIDE DEBRIS (Qls)</b> Loose to medium dense/soft to firm, damp, grayish white, very fine grained, Sandy SILT and Silty, very fine grained SAND matrix; matrix contains brecciated angular clasts of siltstone and claystone.s				
2									
4									
6	LB1-1				-At 5.5 to 7 feet: thick, soft plastic remolded clay bed; high angle; offshoot from main rapture surface below; upper surface is highly polished and striated; (N50E/32°NW)		2		
8	LB1-8			CH	<b>BASAL SLIP SURFACE</b> from 7.5 to 9.5 feet; Soft, moist, brown, olive brown to brownish black, CLAY; plastic, few 0.5-2 inch subrounded gravel				
10	LB1-2			CL	-At 9 feet: 2 to 4-inch thick, very soft, plastic remolded clay with imbricated angular fragments of pink bentonitic claystone mixed in; probable base of slide; (N75W/4°S)		2		
12	LB1-4			CL	<b>ALLUVIUM (Qal)</b> Soft to firm, moist, brownish black, CLAY; some subrounded gravel				
14					Soft to firm, moist, grayish brown to olive brown, Sandy CLAY; few 6-inch to 12-inch diameter subrounded gravel and cobble				
16	LB1-3						2		
18				SC	Dense, damp to moist, olive brown, Clayey, fine to coarse SAND with subrounded cobble and boulders up to 24-inch diameter				
20									
22									
24				SM	<b>VERY OLD PARALIC DEPOSITS (Qvop)</b> Dense to very dense, damp, orangish brown, Clayey, fine to coarse SAND; few sub-horizontal and sub-vertical caliche stainings; contact with alluvium above is horizontal				
26				SC	Dense, moist, orangish brown, Clayey SAND with cobble up to 12-inch diameter				
28				SC	Dense to very dense, brown to orangish brown, Clayey, fine to coarse SAND; massive, trace subrounded gravel and cobble				

**Figure A-1,**  
**Log of Boring LB 1, Page 1 of 2**








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<b>SAMPLE SYMBOLS</b>			... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE			... WATER TABLE OR ... SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

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**SAMPLE SYMBOLS**

 ... SAMPLING UNSUCCESSFUL	 ... STANDARD PENETRATION TEST	 ... DRIVE SAMPLE (UNDISTURBED)
 ... DISTURBED OR BAG SAMPLE	 ... CHUNK SAMPLE	 ... WATER TABLE OR  ... SEEPAGE

# GEOCON

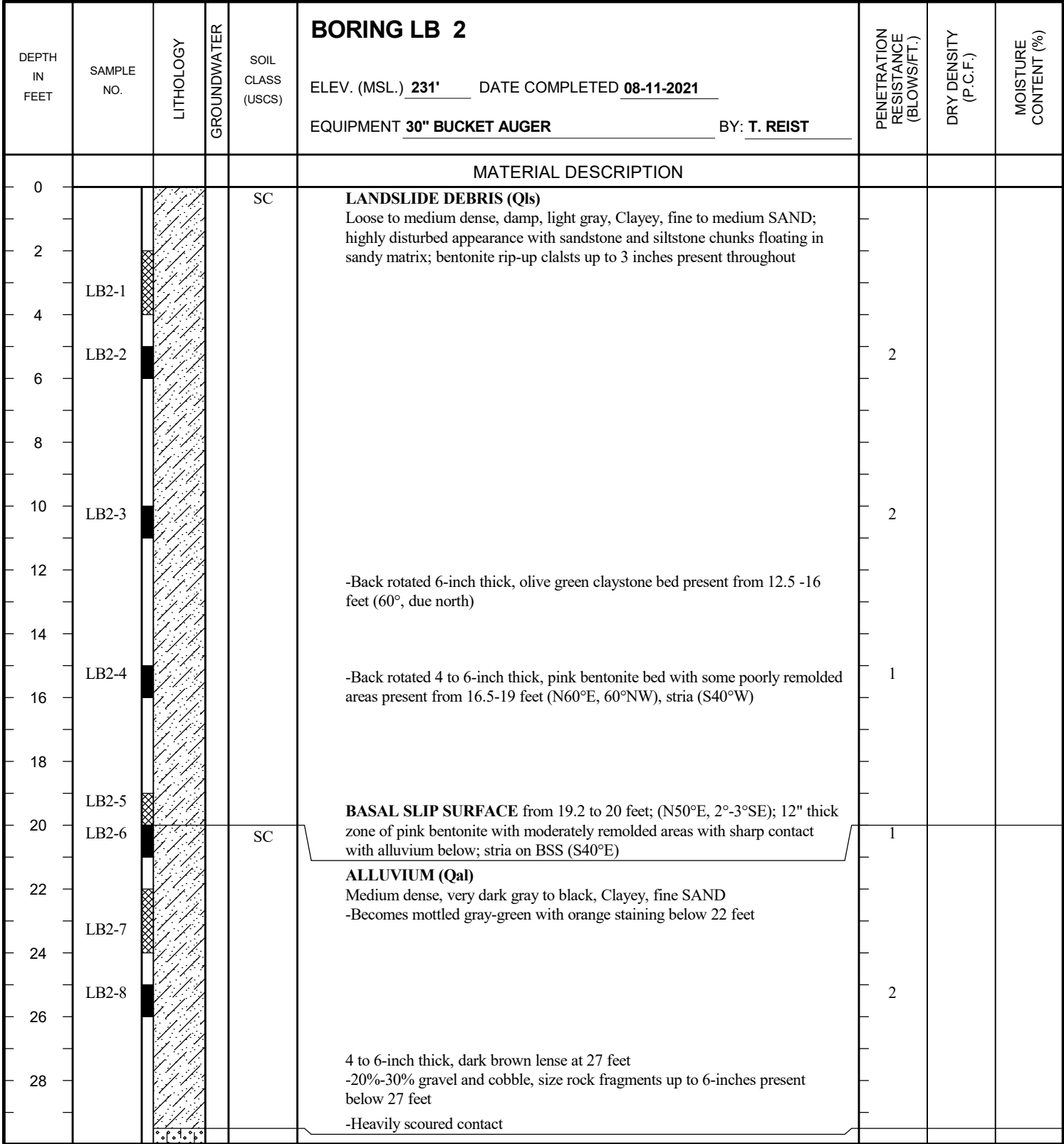









Figure A-2,  
Log of Boring LB 2, Page 1 of 2

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SAMPLE SYMBOLS		... SAMPLING UNSUCCESSFUL		... STANDARD PENETRATION TEST		... DRIVE SAMPLE (UNDISTURBED)
		... DISTURBED OR BAG SAMPLE		... CHUNK SAMPLE		... WATER TABLE OR ... SEEPAGE

06847-42-05.GPJ

**SAMPLE SYMBOLS**








 ... SAMPLING UNSUCCESSFUL	 ... STANDARD PENETRATION TEST	 ... DRIVE SAMPLE (UNDISTURBED)
 ... DISTURBED OR BAG SAMPLE	 ... CHUNK SAMPLE	 ... WATER TABLE OR  ... SEEPAGE

**GEOCON**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	<b>BORING LB 3</b>  ELEV. (MSL.) <u>209'</u> DATE COMPLETED <u>08-11-2021</u>  EQUIPMENT <u>30" BUCKET AUGER</u> BY: <u>T. REIST</u>	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					MATERIAL DESCRIPTION			
				SM&SC	<b>UNDOCUMENTED FILL (Qudf)</b> Loose, damp, light brown, Silty to Clayey, fine to medium SAND			
2				SM&SC	<b>LANDSLIDE DEBRIS (Qls)</b> Loose to medium dense, moist, light gray, Clayey to Silty SAND; no fabric with some small sandstone and bentonite rip-up clasts			
4								
6	LB3-1				<b>BASAL SLIP SURFACE</b> from 5-6 feet; (N40°E, 6°SE); 4 to 6-inch thick, dark gray-green, silty clay bed (remolded in areas) overlying a pulverized discontinuous white and pink bentonite bed	1		
8	LB3-2			CL	<b>ALLUVIUM (Qal)</b> Medium dense, moist, dark grayish brown, Sandy CLAY			
10	LB3-3					1		
12				SC	-Transitional contact Medium dense, moist, gray-green with some orange lenses, Clayey, fine to medium SAND			
14				GM/GC	Medium dense, moist, gray-brown, Sandy to Clayey, GRAVEL with 30% to 50% gravel, cobble and boulder size rock fragments up to 14-inches; boring belled out below 15 feet; unable to log below			
16								
18								
20								
22								
24								
					REFUSAL AT 25.5 FEET DUE TO BOULDERS Groundwater not encountered			

Figure A-3,  
Log of Boring LB 3, Page 1 of 1

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SAMPLE SYMBOLS	 ... SAMPLING UNSUCCESSFUL	 ... STANDARD PENETRATION TEST	 ... DRIVE SAMPLE (UNDISTURBED)
	 ... DISTURBED OR BAG SAMPLE	 ... CHUNK SAMPLE	 ... WATER TABLE OR  ... SEEPAGE

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DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	<b>BORING LB 4</b>  ELEV. (MSL.) <u>215'</u> DATE COMPLETED <u>08-12-2021</u>  EQUIPMENT <u>30" BUCKET AUGER</u> BY: <u>R. ADAMS</u>	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					<b>MATERIAL DESCRIPTION</b>			
2				SM	<b>UNDOCUMENTED FILL (Qudf)</b> Loose, dry, light gray, Silty, fine to coarse SAND; gravel lenses and very young slopewash with trash incorporated; silty layers are laminated			
4	LB4-1			CL	<b>ALLUVIUM (Qal)</b> Firm to stiff, damp to moist, dark brownish black, Sandy CLAY; trace sub-rounded gravel; few roots	2		
6				ML	Firm, damp, dark brown, fine, Sandy SILT; trace clay, few roots and trace caliche			
8								
10	LB4-2			GM&GC	Medium dense, damp, olive brown, Silty and Clayey SAND with subrounded cobble and boulders up to 14-inch diameter; undulatory contact; matrix supported			
12				SM	<b>OTAY FORMATION (To)</b> Dense, dry to damp, pale yellowish gray, Silty, very fine grained SANDSTONE; few horizontal and vertical caliche stingers			
14	LB4-3			ML	Hard, damp, grayish brown to olive brown, Clayey SILTSTONE; weakly bedded with little fracturing; caliche along fracture surface; (Bedding N70°W/6°SW)	6/8"		
16				SM	Dense, damp, grayish white, Silty, fine SANDSTONE; few olive brown 1 to 2-inch thick clay siltstone interbeds; bedding offset approximately 1" along a closed clay filled fracture: Fracture: N20°W/Subvertical; Bedding: N60°W/4°SW			
18					-At 18 feet: becomes massive			
20	LB4-4					8/8"		
22								
24								
26	LB4-5					8		
28				SM	Dense, damp, whitish gray, Silty, fine to coarse SANDSTONE; massive			
					-At 29 feet: becomes brown, weakly cemented			

**Figure A-4,**  
**Log of Boring LB 4, Page 1 of 2**

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SAMPLE SYMBOLS	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR ... SEEPAGE

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DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	BORING LB 4  ELEV. (MSL.) 215'    DATE COMPLETED 08-12-2021  EQUIPMENT 30" BUCKET AUGER    BY: R. ADAMS	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)	
30	LB4-6				MATERIAL DESCRIPTION	6/6"			
32					Concretionary sandstone bed; horizontal				
34	LB4-7			ML	Hard, damp, pale olive brown to grayish brown, very fine grained, Sandy SILTSTONE with some small angular gravel; trace clay				
36					-At 35-39 feet: few angular gravel fragments up to 0.5-inch diameter				
38									
40	LB4-8						8/8"		
						BORING TERMINATED AT 40 FEET Groundwater not encountered Backfilled on 08-12-2021			

**Figure A-4,**  
**Log of Boring LB 4, Page 2 of 2**








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SAMPLE SYMBOLS		... SAMPLING UNSUCCESSFUL		... STANDARD PENETRATION TEST		... DRIVE SAMPLE (UNDISTURBED)
		... DISTURBED OR BAG SAMPLE		... CHUNK SAMPLE		... WATER TABLE OR  ... SEEPAGE

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**SAMPLE SYMBOLS**

 ... SAMPLING UNSUCCESSFUL	 ... STANDARD PENETRATION TEST	 ... DRIVE SAMPLE (UNDISTURBED)
 ... DISTURBED OR BAG SAMPLE	 ... CHUNK SAMPLE	 ... WATER TABLE OR  ... SEEPAGE

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DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	BORING LB 5B  ELEV. (MSL.) <u>224'</u> DATE COMPLETED <u>08-12-2021</u>  EQUIPMENT <u>30" BUCKET AUGER</u> BY: <u>R. ADAMS</u>	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					MATERIAL DESCRIPTION			
2				SM	VERY OLD PARALIC DEPOSITS (Qvp) Dense, dry to damp, orange to reddish brown, fine to medium SAND; trace silt			
4				SM	At 4 feet: steeply dipping contact: N70°W/44°NE			
6	LB5B-1			SM	SAN DIEGO FORMATION (Tsd) Dense, damp to moist, pale yellowish brown, Silty, very fine grained SANDSTONE; steeply dipping: N72°W/18°NE, interbedded with coarse sand below	4		
8				SM	Dense, dry to damp, grayish white to orangish gray, medium to coarse SANDSTONE; laminated and cross-bedded, trace fine gravel, micaceous, very low cohesion			
10	LB5B-2			SM	Dense, dry to damp, grayish white, fine to coarse SANDSTONE; laminated and cross-bedded, highly micaceous	7		
12	LB5B-4			SM	Dense, dry to damp, grayish white, medium to coarse SANDSTONE; laminated and cross-bedded, top contact truncates primary laminations; contact: N20°E/50°NW; high angle cross bedding N25°E/38°NW			
14	LB5B-3			SM	Dense, damp to moist, pale yellowish brown to grayish brown (mottled), Silty, very fine grained SANDSTONE; trace clay, few thin discontinuous medium to coarse sand; interbeds highly micaceous	3		
16				SM	Dense, damp to moist, pale yellowish brown to grayish brown (mottled), Silty, very fine grained SANDSTONE; trace clay, few thin discontinuous medium to coarse sand; interbeds highly micaceous			
18				ML	Hard, damp, grayish brown, Clayey SILTSTONE; massive			
20				SM	Dense, damp, grayish brown, Silty, very fine grained SANDSTONE; highly micaceous, abundant detrital charcoal			
22				SC	Dense, damp to moist, grayish brown to orangish brown, Clayey, fine to coarse SANDSTONE with subrounded cobble up to 10-inch diameter; top contact: N60°E/55°NW			
24								
26					PRACTICAL REFUSAL AT 26 FEET DUE TO COBBLE Groundwater not encountered Backfilled on 08-12-2021			

**Figure A-6,**  
**Log of Boring LB 5B, Page 1 of 1**

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SAMPLE SYMBOLS	 SAMPLING UNSUCCESSFUL  DISTURBED OR BAG SAMPLE	 STANDARD PENETRATION TEST  CHUNK SAMPLE	 DRIVE SAMPLE (UNDISTURBED)  WATER TABLE OR SEEPAGE

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DEPTH IN FEET	SAMPLE NO	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	BORING LB 6  ELEV. (MSL.) 347'      DATE COMPLETED 08-16-2021  EQUIPMENT 30" BUCKET AUGER      BY: T. REIST	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					MATERIAL DESCRIPTION			
2				SM/SC	LANDSLIDE DEBRIS (Qls) Loose, dry to damp, dark brown, Silty to Clayey, fine to coarse SAND with 10-20% gravel and cobble size rock fragments up to 6-inches; occasional boulders up to 24-inches also present			
4	LB6-1							
6					-Gradational contact			
8				GM	Dense, damp, reddish brown, fine to coarse, Sandy GRAVEL with 50-60% gravel and cobble size rock fragments up to 6-inches; occasional boulders up to 24-inches; landslide block			
10					-Becomes clast supported with 60-80% gravel and cobble size rock fragments; little to no cohesion; unable to log below 11 feet due to belled out boring			
12								
14					-Several 24-inch boulders extracted at 13 feet			
16								
18					-Slow difficult drill conditions; auger ripper and core barrel used throughout; 7 hours to drill 35 feet			
20								
22								
24								
26								
28	LB6-2							

Figure A-7,  
Log of Boring LB 6, Page 1 of 2







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SAMPLE SYMBOLS		SAMPLING UNSUCCESSFUL		STANDARD PENETRATION TEST		DRIVE SAMPLE (UNDISTURBED)
		DISTURBED OR BAG SAMPLE		CHUNK SAMPLE		WATER TABLE OR SEEPAGE

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**SAMPLE SYMBOLS**



	... SAMPLING UNSUCCESSFUL		... STANDARD PENETRATION TEST		... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG-SAMPLE		... CHUNK SAMPLE		... WATER TABLE OR  ... SEEPAGE

# GEOCON

DEPTH IN FEET	SAMPLE NO	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	<b>BORING LB 7</b>  ELEV. (MSL.) <u>340'</u> DATE COMPLETED <u>08-17-2021</u>  EQUIPMENT <u>30" BUCKET AUGER</u> BY: <u>R. ADAMS</u>	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					MATERIAL DESCRIPTION			
2				ML	LANDSLIDE DEBRIS (Qls) Soft, dry, whitish-brown to grayish-brown, SILT; trace clay and subrounded gravel; pulverized soil matrix with small angular sandstone and siltstone fragments			
4								
6	LB7-1				At 5 feet: becomes damp	PUSH		
8	LB7-2							
10	LB7-3					2		
12				ML	Soft to firm, damp to moist, grayish-brown to brown, Clayey SILT; few subrounded gravel and small cobble up to 4-inch diameter; numerous fragments of siltstone and claystone throughout			
14								
16	LB7-4					4		
18				CL	Firm, moist, brown, Sandy CLAY with gravel			
20				CL	Firm, moist, brown to reddish-brown, medium coarse, Sandy CLAY; few subrounded gravel and angular sandstone/siltstone fragments			
22				ML	Soft, damp to moist, grayish-brown, Clayey SILT; few subrounded gravel and sandstone and siltstone fragments; disseminated caliche throughout			
24								
26								
28	LB7-5			SM	Loose, dry, grayish-brown, Silty, fine to medium SAND; friable with angular fragments of siltstone and claystone throughout  BASAL SLIP SURFACE at 28.5 to 32 feet: 2 to 6-inch thick zone of pulverized claystone with limited remolding; 2 to 6-inch diameter subrounded			

Figure A-8,  
Log of Boring LB 7, Page 1 of 3

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SAMPLE SYMBOLS		SAMPLING UNSUCCESSFUL		STANDARD PENETRATION TEST		DRIVE SAMPLE (UNDISTURBED)
		DISTURBED OR BAG SAMPLE		CHUNK SAMPLE		WATER TABLE OR SEEPAGE

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DEPTH IN FEET	SAMPLE NO	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	BORING LB 7  ELEV. (MSL.) <u>340'</u> DATE COMPLETED <u>08-17-2021</u>  EQUIPMENT <u>30" BUCKET AUGER</u> BY: <u>R. ADAMS</u>	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
30	LB7-6			SM	cobble along upper contact with overlying slide debris; top and bottom surfaces of shear zone are planar with some polish. Slide plane: N60°W/50°SW	8		
32				ML	OTAY FORMATION (To) Hard, dry to damp, grayish-brown, very fine grained, Sandy SILTSTONE; few high-angle fractures with soft, moist, brown clay infill			
34								
36	LB7-7				At 35 feet: silty claystone interbedded with minor offset along subvertical fractures, bedding horizontal	10		
38								
40	LB7-8				At 40 feet: 4-inch thick, olive brown, silty claystone bed with minor offset	10/8"		
42								
44					At 43 feet: 12-inch thick olive brown, silty claystone bed			
46	LB7-9				At 45 feet: 12-inch thick olive brown, silty claystone bed: N15°W/12°E	8		
48								
50	LB7-10					6		
52					At 51 feet: high-angle fracture with soft, plastic, clay infill, fracture: N70°W/55°S			
54								
56	LB7-11			SM	At 56 feet: 2-inch thick, olive brown to grayish-brown, silty claystone interbeds. Bedding: N60°W/13°S	10/4"		
58					Dense, damp, pale yellowish-brown, Silty, fine to medium SANDSTONE; massive, micaceous, occasional subhorizontal concretionary beds At 58 feet: broken concretionary bed with 1 to 2-inch offset along high-angle fracture			

**Figure A-8,**  
**Log of Boring LB 7, Page 2 of 3**

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SAMPLE SYMBOLS								
	... SAMPLING UNSUCCESSFUL		... STANDARD PENETRATION TEST		... DRIVE SAMPLE (UNDISTURBED)		... WATER TABLE OR	... SEE PAGE
	... DISTURBED OR BAG SAMPLE		... CHUNK SAMPLE					

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



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**SAMPLE SYMBOLS**

 ... SAMPLING UNSUCCESSFUL	 ... STANDARD PENETRATION TEST	 ... DRIVE SAMPLE (UNDISTURBED)
 ... DISTURBED OR BAG SAMPLE	 ... CHUNK SAMPLE	 ... WATER TABLE OR  ... SEEPAGE




# GEOCON



DEPTH IN FEET	SAMPLE NO	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	BORING LB 8  ELEV. (MSL.) <u>293'</u> DATE COMPLETED <u>08-18-2021</u>  EQUIPMENT <u>30" BUCKET AUGER</u> BY: <u>R. ADAMS</u>	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					MATERIAL DESCRIPTION			
2	LB8-1			SM	LANDSLIDE DEBRIS (Qls) Dense, dry to damp, grayish-white, Silty, fine to medium SANDSTONE; laminated and fractured			
4				ML	Hard, dry to damp, grayish-brown, Clayey SILTSTONE; massive to weakly bedding, bedding: near horizontal, 0.5-inch wide sand filled fractures/subvertical below contact			
6	LB8-2			SM	Dense, dry to damp, pale yellowish-white, Silty, fine to medium SANDSTONE; massive, few small concretions	5/10"		
8	LB8-3				At 8.5-8.7 feet: 6-inch thick, brown, silty claystone bed with 2" offset along subvertical fractures noted above fracture: (N78E/58°S)	7		
10								
12					At 12 feet: few sand filled, subvertical fractures			
14	LB8-4					6/8"		
16	LB8-5				At 16 feet: 2-inch thick brown to grayish-brown, silty claystone bed offset and truncated by fractures above; bedding horizontal (approx)			
18	LB8-6			ML	Hard, damp, olive gray to grayish-brown, Clayey SILTSTONE; massive, offset against subvertical fractures (12-inch offset) Fracture: N45E/60°SE; Bedding horizontal	7/10"		
20				SM	Dense, damp, grayish-brown to white, Silty, fine to medium SANDSTONE; laminated with 0.5-inch thick horizontal white laminae with 1 to 2-inch spacing, few 0.5-inch thick claystone interbeds (discontinuous)	8		
22	LB8-7							
24								
26								
28								

**Figure A-9,**  
**Log of Boring LB 8, Page 1 of 2**

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SAMPLE SYMBOLS		SAMPLING UNSUCCESSFUL		STANDARD PENETRATION TEST		DRIVE SAMPLE (UNDISTURBED)
		DISTURBED OR BAG SAMPLE		CHUNK SAMPLE		WATER TABLE OR SEEPAGE

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DEPTH IN FEET	SAMPLE NO	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	BORING LB 8  ELEV. (MSL.) 293'      DATE COMPLETED 08-18-2021  EQUIPMENT 30" BUCKET AUGER      BY: R. ADAMS	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
30	LB8-9			SM	MATERIAL DESCRIPTION	5		
32	LB8-8			CH				
34	LB8-10			SM	OTAY FORMATION (To) Dense, damp, olive brown, Silty, very fine grained SANDSTONE; massive (gunbarrel), few siltstone interbeds	10/6"		
36								
38	LB8-11			ML	Hard, damp, dark brown to grayish-brown, very fine grained, Sandy SILTSTONE with few clayey siltstone interbeds; massive to very weakly bedded, bedding is horizontal	10/10"		
40								
42								
44				SM	Dense to very dense, damp, pale yellowish white, Silty, fine to medium SANDSTONE; massive, micaceous			
46								
48					BORING TERMINATED AT 48 FEET Groundwater not encountered Backfilled on 08-18-2021			

**Figure A-9,**  
**Log of Boring LB 8, Page 2 of 2**

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SAMPLE SYMBOLS		SAMPLING UNSUCCESSFUL		STANDARD PENETRATION TEST		DRIVE SAMPLE (UNDISTURBED)
		DISTURBED OR BAG SAMPLE		CHUNK SAMPLE		WATER TABLE OR SEEPAGE







NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.





DEPTH IN FEET	SAMPLE NO	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	BORING LB 9  ELEV. (MSL.) 271'      DATE COMPLETED 08-18-2021  EQUIPMENT 30" BUCKET AUGER      BY: R. ADAMS	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	LANDSLIDE DEBRIS (Qls) Hard, damp, grayish-brown, CLAY; highly fractured, bedding: N70E/11°N			
2				SM	Medium dense to dense, dry to damp, pale yellowish-white, Silty SAND; several sandy clay filled subvertical. some with 8-inch opening			
4	LB9-1					2		
6	LB9-10			CH	BASAL SLIP SURFACE from 6 to 9.5 feet; Soft, moist, olive brown, Clay bed; bed in variable in thickness (6 to 12-inch) with offset along high-angle fractures, upper 1 to 4-inch is highly plastic and remolded, chunks of silty sandstone incorporated into remolded zone claystone, bed is bifurcated and ramped			
8				CH				
10	LB9-2			SM	Soft to firm, damp to moist, brown, pinkish-brown, pink bentonite bed; weak to moderately to highly sheared, top contact undulatory; bottom contact is planar: N80°E/2-6°S	8/10"		
12					OTAY FORMATION (To) Dense, damp, pale, yellowish-brown, Silty, very fine grained SANDSTONE interbedded with olive brown, very fine grained, Sandy SILTSTONE; horizontal bedding			
14	LB9-3					6/5"		
16								
18				ML	Hard, moist, olive gray to olive brown, Clayey SILTSTONE; massive			
20	LB9-4					8/8"		
22				SM	Dense, damp, pale, yellowish-brown, Silty, very fine grained SANDSTONE; few 2 to 6-inch thick brown clayey siltstone interbeds; bedding horizontal			
24	LB9-5					8/10"		
26								
28				SM	Dense, damp, pale yellowish brown, Silty, fine to medium SANDSTONE;			

**Figure A-10,**  
**Log of Boring LB 9, Page 1 of 2**

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SAMPLE SYMBOLS	 SAMPLING UNSUCCESSFUL  DISTURBED OR BAG SAMPLE	 STANDARD PENETRATION TEST  CHUNK SAMPLE	 DRIVE SAMPLE (UNDISTURBED)  WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

DEPTH IN FEET	SAMPLE NO	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	BORING LB 9  ELEV. (MSL.) 271'      DATE COMPLETED 08-18-2021  EQUIPMENT 30" BUCKET AUGER      BY: R. ADAMS	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
30	LB9-6			SM	massive; occasional isolated 2 to 6-inch concretions and 1 to 2-inch thick concretionary beds	10/8"		
32								
34								
36	LB9-7					10/8"		
38								
40	LB9-8				Hard, damp, olive brown, Clayey SILTSTONE; massive; top contact is horizontal	10/8"		
42								
44				ML				
46	LB9-9					10		
48								
50				CL/CH	Stiff to hard, moist, pink, bentonitic CLAYSTONE; no remolding			
				ML	Hard, damp to moist, olive brown, Clayey SILTSTONE; massive			
BORING TERMINATED AT 50 FEET Groundwater not encountered Backfilled on 08-18-2021								

**Figure A-10,**  
**Log of Boring LB 9, Page 2 of 2**

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SAMPLE SYMBOLS					
	... SAMPLING UNSUCCESSFUL			... STANDARD PENETRATION TEST	
	... DISTURBED OR BAG SAMPLE			... CHUNK SAMPLE	
				... DRIVE SAMPLE (UNDISTURBED)	
				... WATER TABLE OR ... SEEPAGE	

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

DEPTH IN FEET	SAMPLE NO	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	BORING LB 10  ELEV. (MSL.) <u>349'</u> DATE COMPLETED <u>08-19-2021</u>  EQUIPMENT <u>30" BUCKET AUGER</u> BY: <u>R. ADAMS</u>	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					MATERIAL DESCRIPTION			
2				ML	LANDSLIDE DEBRIS (Qls) Soft, dry, grayish-brown, Sandy SILT; friable, isolated subrounded gravel and cobble throughout			
4								
6	LB10-1					3		
8				CL	Soft, damp, brown, Sandy CLAY; isolated angular cluster of claystone within clay native, occasional pods of caliche			
10	LB10-2			SM	Loose, dry to damp, orangish-brown, Silty, fine to medium SAND; angular sandstone fragments throughout	4		
12								
14					At 13 feet: numerous 4 to 12-inch diameter subrounded cobble			
16								
18				CH	PRIMARY BASAL SLIP SURFACE: from 18 to 21 feet; primary slip surface consisting of 0.5-inch thick, brown plastic clay bed, polished and striated along basal slip surface, N42°W/45°-50°S; striae are down dip.			
20	LB10-3				Below BSS becomes hard, reddish brown, claystone; highly brecciated with ramping juxtaposing claystone and sandstone	3		
22								
24					At 23 feet: lower remolded clay bed; weakly remolded (N35°W/70°SW)			
26	LB10-4			SM	OTAY FORMATION (To) Dense, dry to damp, pale yellowish brown to white, Silty, very fine grained SANDSTONE; massive, micaceous	8		
28				ML	Hard, damp, olive brown, very fine grained, Sandy SILTSTONE			

**Figure A-11,**  
**Log of Boring LB 10, Page 1 of 4**

06847-42-05.GPJ

SAMPLE SYMBOLS					
	... SAMPLING UNSUCCESSFUL			... STANDARD PENETRATION TEST	
	... DISTURBED OR BAG SAMPLE			... CHUNK SAMPLE	
				... WATER TABLE OR	

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

DEPTH IN FEET	SAMPLE NO	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	BORING LB 10  ELEV. (MSL.) <u>349'</u> DATE COMPLETED <u>08-19-2021</u>  EQUIPMENT <u>30" BUCKET AUGER</u> BY: <u>R. ADAMS</u>	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
30	LB10-5			CL	Hard, damp, reddish-brown, Silty, CLAYSTONE; some anastomosing, subvertical fractures with 1/16-inch opening	8		
32	LB10-6							
34				ML	Hard, damp, grayish-brown to yellowish-brown, very fine grained, Sandy SILTSTONE; micaceous, weakly laminated	10		
36	LB10-7							
38				CL	Hard, damp, reddish-brown, Silty CLAYSTONE			
40	LB10-8					10		
42				ML	Hard, damp, pale yellowish-brown, very fine grained, Sandy SILTSTONE			
44						10		
46	LB10-9				<p>BEDDING PLANE SHEAR at 41.8 feet: 2 to 3-inch thick, reddish-brown, clay bed with weak to moderate remolding along top surface; poorly developed bedding plane shear; bedding is horizontal</p> <p>At 46 feet: 0.5 to 1-inch open fracture: N50°-75°W/80°S</p>			
48								
50	LB10-10			CL	Hard, damp, reddish-brown, CLAYSTONE; some fracturing: N73°W/88°S	10/10"		
52				SM				
54					Dense, dry to damp, yellowish-brown to whitish-brown, Silty, fine to medium SANDSTONE; weakly laminated, fractured with some open and sand-filled fractures: N65°E/70°W/vertical			
56	LB10-11					10/8"		
58					<p>Prominent fracture between 56 to 59 feet; Hard, damp, brown, Silty CLAYSTONE; juxtaposed to dense, damp, orangish-white, Silty, fine SANDSTONE; 0.5 to 2-inch of clay gouge between two polished surfaces, Fracture: N70°E/68°S, striae 68° towards S20°E)</p>			

**Figure A-11,**  
**Log of Boring LB 10, Page 2 of 4**

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SAMPLE SYMBOLS								
	... SAMPLING UNSUCCESSFUL		... STANDARD PENETRATION TEST		... DRIVE SAMPLE (UNDISTURBED)		... WATER TABLE OR	... SEEPAGE
	... DISTURBED OR BAG SAMPLE		... CHUNK SAMPLE					

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES

DEPTH IN FEET	SAMPLE NO	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	<b>BORING LB 10</b>		PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					ELEV. (MSL.) <u>349'</u>	DATE COMPLETED <u>08-19-2021</u>			
					EQUIPMENT <u>30" BUCKET AUGER</u> BY: <u>R. ADAMS</u>				
					MATERIAL DESCRIPTION				
60				CL	Hard, damp to moist, brown, Silty CLAYSTONE; blocky and fractured with some weak friable zones				
62									
64									
66	LB10-12			SM	Dense, damp, pale yellowish-brown to whitish-brown, Silty, fine to medium SANDSTONE; laminated and micaceous, hole caved between 65-70 feet along several parallel high angle fractures: N30E/80°SE		10/8"		
68									
70	LB10-13			SM	Dense, damp, pale orangish-brown to yellowish-brown, Silty, fine SANDSTONE with olive brown sandy siltstone interbeds, massive, substantially less fracturing below 70 feet		15/8"		
72									
74									
76	LB10-14						15/8"		
78					At 78 feet: few isolated concretions				
80	LB10-15						25/6"		
82					At 81 feet: few small pink bentonitic clay rip-up clasts				
84				ML	Hard, damp, olive brown to yellowish brown, very fine grained, Sandy SILTSTONE; trace clay; massive		25/10"		
86	LB10-16								
88				SM	Dense, damp, yellowish-brown, Silty, fine to medium SANDSTONE; massive				


**Figure A-11,**  
**Log of Boring LB 10, Page 3 of 4**

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SAMPLE SYMBOLS					
	SAMPLING UNSUCCESSFUL			STANDARD PENETRATION TEST	
	DISTURBED OR BAG SAMPLE			CHUNK SAMPLE	
				DRIVE SAMPLE (UNDISTURBED)	
				WATER TABLE OR SEEPAGE	





NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



DEPTH IN FEET	SAMPLE NO	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	BORING LB 10  ELEV. (MSL.) <u>349'</u> DATE COMPLETED <u>08-19-2021</u>  EQUIPMENT <u>30" BUCKET AUGER</u> BY: <u>R. ADAMS</u>	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)		
90	LB10-17			CH	MATERIAL DESCRIPTION  Soft, firm, damp to moist, pink to whitish-pink, plastic CLAYSTONE; bentonite; several continuous 1/8-14" thick highly plastic remolded zones throughout, <b>BEDDING PLANE SHEAR:</b> at 91.5 feet, 1/4 to 1/2-inch thick soft, plastic, brown, highly remolded clay gouge (N50°E/6°SE)  Hard, damp, olive brown, very fine grained, Sandy SILTSTONE; massive	20				
92	LB10-18			ML						
94										
96	LB10-19							30/6"		
98										
100					BORING TERMINATED AT 100 FEET Groundwater not encountered Backfilled on 08-19-2021					

**Figure A-11,**  
**Log of Boring LB 10, Page 4 of 4**

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SAMPLE SYMBOLS					
	... SAMPLING UNSUCCESSFUL			... STANDARD PENETRATION TEST	
	... DISTURBED OR BAG SAMPLE			... CHUNK SAMPLE	
				... DRIVE SAMPLE (UNDISTURBED)	
				... WATER TABLE OR ... SEEPAGE	

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.





DEPTH IN FEET	SAMPLE NO	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	<b>BORING LB 11</b>		PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					ELEV. (MSL.) <u>291'</u>	DATE COMPLETED <u>08-20-2021</u>			
					EQUIPMENT <u>30" BUCKET AUGER</u> BY: <u>R. ADAMS</u>				
					MATERIAL DESCRIPTION				
0				CL	<b>LANDSLIDE DEBRIS (Qls)</b> Stiff, moist, dark brown to olive brown, Sandy CLAY; numerous angular rock fragments and caliche pods and stingers				
2									
4									
6	LB11-1				At 6 feet: mix of sandy clay and sandy silt with angular rock fragments		3		
8	LB11-3				At 6-9.5 feet: high angle fracture juxtaposing sandstone and heterogeneous mix of broken siltstone and sandstone fragments in clayey matrix of north wall of boring, no gouge, remolding or polished surfaces note. Fracture: (N85°W/69°-75°N)				
10	LB11-2			SM	Dense, damp, pale yellowish-brown, Silty, fine to medium SANDSTONE; numerous clay filled fractured with rootlets		5		
12					At 12 feet: broken clayey siltstone interbeds				
14					At 14 feet: offset 3-inch thick brown claystone bed, (approx. bedding N75W/11°NE), fractures are subvertical, filled with fine sand and extend down to approximately 25 feet		6		
16	LB11-4								
18									
20	LB11-5				At 21 feet: broken/offset concretionary bed		8/10"		
22					At 22 feet: broken/offset silty claystone bed				
24									
26	LB11-6						6		
28	LB11-12 LB11-7			CH	<b>BASAL SLIP SURFACE</b> from 26.5 to 28.5 feet: 18-inch thick, pink to whitish-pink to pinkish-brown, bentonite clay seam, capped by 0.5 to 2.5-inch thick brown highly remolded clay top and bottom with numerous polished parting surfaces, bentonite seam is sheared and brecciated, roots present along basal surface				

**Figure A-12,**  
**Log of Boring LB 11, Page 1 of 2**

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SAMPLE SYMBOLS					
	... SAMPLING UNSUCCESSFUL		... STANDARD PENETRATION TEST		... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE		... CHUNK SAMPLE		... WATER TABLE OR  ... SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

DEPTH IN FEET	SAMPLE NO	LITHOLOGY	GROUNDWATER	BORING LB 11		PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
				SOIL CLASS (USCS)	ELEV. (MSL.) <u>291'</u> DATE COMPLETED <u>08-20-2021</u> EQUIPMENT <u>30" BUCKET AUGER</u> BY: <u>R. ADAMS</u>			
					MATERIAL DESCRIPTION			
30	LB11-8			SM	upper BPS N45E/10-14°SE, lower BPS subhorizontal <2° Dip <b>OTAY FORMATION (To)</b> Dense, damp, olive brown to pale yellowish-brown, Silty, fine SANDSTONE; massive (gunbarrel), micaceous, few 1 to 4-inch thick brown, silty claystone interbeds	10/8"		
32								
34								
36	LB11-9					12/6"		
38				ML	Hard, damp, olive brown to reddish-brown, very fine grained, Sandy SILTSTONE; trace clay, massive			
40	LB11-10			SM	Dense, damp, pale yellowish-brown, Silty, very fine grained SANDSTONE; massive, micaceous, few concretionary zones	12/8"		
42								
44					At 44 feet: 4 to 6-inch thick reddish-brown, claystone bed with minor offset/hanging along subvertical fracture			
46	LB11-11			SM	-clay bed bedding subhorizontal; fracture: N15W/75°W Dense, damp, pale yellowish brown to white, Silty, medium to coarse SANDSTONE; massive	15/8"		
48								
50					BORING TERMINATED AT 50 FEET Groundwater not encountered Backfilled on 08-20-2021			

**Figure A-12,**  
**Log of Boring LB 11, Page 2 of 2**

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SAMPLE SYMBOLS					
	... SAMPLING UNSUCCESSFUL			... STANDARD PENETRATION TEST	
	... DISTURBED OR BAG SAMPLE			... CHUNK SAMPLE	
				... DRIVE SAMPLE (UNDISTURBED)	
				... WATER TABLE OR ... SEEPAGE	

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.





**GEOCON**

# Log of Boring CC 1

Project No.: 06847-42-05  
Client:

Date: 8/3/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 490.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
1	489							Boring cased to 9 feet.
2	488							
3	487							
4	486							
5	485							
6	484							
7	483							
8	482							
9	481							
10	480	1	2.5	40				<b>VERY OLD PARALIC DEPOSITS (Qvop)</b> Dense, damp, light brown, Silty, fine to coarse SAND with interbedded gravel size rock fragments up to 3 inches.  -Charcoal flecks present below.  -Lower cohesion below 16.5 feet.
11	479							
12	478							
13	477							
14	476	1	5	90				
15	475							
16	474							
17	473					SM		
18	472							
19	471	1	5	40				
20	470							
21	469							
22	468							
23	467	1	3.5	71				
24	466							



**GEOCON**

# Log of Boring CC 1

Projec No.: 06847-42-05  
Client:

Date: 8/3/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 490.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
26	464	2	1.5	33		SM		
27	463							Dense, damp, light brown, fine to coarse, Sandy GRAVEL with some interbeds of silty sand.
28	462	2	3.5	57		GM		
29	461							
30	460							
31	459	2	1.5	0				Dense, damp, light brown, fine to medium SAND with low cohesion.
32	458							
33	457					SP		
34	456	2	5	90				
35	455							
36	454							Dense, damp, light brown, fine to coarse, Sandy GRAVEL with some silty to clayey sand lenses.
37	453							
38	452	2	3.5	100				
39	451							
40	450							
41	449	3	1.5	67		GM		
42	448							
43	447	3	3	83				
44	446							
45	445	3	1	50				
46	444	3	1	100				
47	443							Dense, damp, gray, Silty, fine SAND with mica and trace gravel.
48	442	3	5	100		SM		
49	441							



**GEOCON**

# Log of Boring CC 1

Project No.: 06847-42-05  
Client:

Date: 8/3/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 490.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
51	439	3	5	100				-Becomes gray to light brown with some orange mottling below 51 feet.
52	438							
53	437							
54	436	4	5	100				-Becomes fine to medium grained below 54 feet.
55	435							
56	434					SM		-Becomes predominately gray with faint orange staining below 56 feet.
57	433							
58	432							
59	431	4	5	100				
60	430							
61	429							-Sharp contact.
62	428							
63	427							<b>OTAY FORMATION (To)</b> Dense, damp, gray, Silty, fine SANDSTONE.
64	426	5	5	100				
65	425							
66	424							
67	423					SM		-4-inch thick, gray sandy claystone bed at 66.5 feet.
68	422							
69	421	5	5	100				
70	420							
71	419							
72	418							
73	417	6	5	100				Hard, moist, gray, interbedded Silty CLAYSTONE and Clayey to fine, Sandy
74	416					CL&ML		SILTSTONE.



**GEOCON**

# Log of Boring CC 1

Projec No.: 06847-42-05  
Client:

Date: 8/3/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 490.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery USCS Class	Lithology	Material Description
76	414	6	5	100	CL&M		-Becomes reddish brown with olive green mottling below 75.5 feet.
							BORING TERMINATED AT 76.5 FEET Groundwater not encountered.





**GEOCON**

# Log of Boring CC 2

Project No.: 06847-42-05  
Client:

Date: 8/5/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 486.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
1	485							Boring cased to 9 feet.
2	484							
3	483							
4	482							
5	481							
6	480							
7	479							
8	478							
9	477							
10	476	1	2	100		SM		<b>VERY OLD PARALIC DEPOSITS (Qvop)</b> Dense, damp, light brown, Silty, fine to medium SAND.
11	475							Dense, damp, light brown, Silty, fine to coarse, Sandy GRAVEL with interbedded silty, fine to coarse SAND layers.
12	474							
13	473	1	4	63				
14	472							
15	471	1	1	0				
16	470							
17	469							
18	468	1	5	90		GM		
19	467							
20	466							
21	465							
22	464							
23	463	2	5	100				
24	462							



**GEOCON**

# Log of Boring CC 2

Project No.: 06847-42-05  
Client:

Date: 8/5/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 486.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
26	460	2	5	100				
27	459	2	2	100				
28	458							
29	457	2	3	100				
30	456							
31	455							
32	454							
33	453	3	5	100				
34	452							
35	451							
36	450	3	1	100		GM		
37	449							
38	448							
39	447	3	4	100				
40	446							
41	445							
42	444							
43	443	4	5	100				
44	442							
45	441							
46	440							
47	439							Dense, damp, gray with some orange mottling, Silty, SAND with mica.
48	438	4	5	90		SM		
49	437							



**GEOCON**

# Log of Boring CC 2

Projec No.: 06847-42-05  
Client:

Date: 8/5/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 486.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
51	435	4	5	90				-Fine grained lenses present below 51 feet.
52	434							
53	433	5	5	90				
54	432							
55	431					SM		
56	430							
57	429							
58	428	5	4	100				
59	427							
60	426							-Becomes fine to medium grained at 59.5 feet -Sharp contact.
61	425	6	1	100				<b>OTAY FORMATION (To)</b>
62	424					SM		Dense, damp, gray, Silty, fine SANDSTONE.
63	423							-4-inch thick, brown claystone bed at 62 feet.
64	422	6	5	100				-Fracture at 62.5 feet; through going planar surface; no evidence of remolding.
65	421							-Gradational contact.
66	420					ML		Hard, moist, gray, Clayey to fine, Sandy SILTSTONE.
67	419	6	1.5	100				-Fracture at 64.8 feet.
68	418							
69	417	6	4	75				Dense, damp, gray, Silty, fine SANDSTONE.
70	416							
71	415					SM		-High angle fracture at 71.1 feet.
72	414							
73	413	7	5	100				-6-inch cemented layer at 73 feet with 6-inch siltstone bed below.
74	412					CL		Hard, moist, dark brown, Silty CLAYSTONE.





**GEOCON**

# Log of Boring CC 2

Projec No.: 06847-42-05  
Client:

Date: 8/5/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 486.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
76	410	7	5	100		CL		-Bedding Plane Shear at 75 feet; 1/8-inch thick, soft, moist, brown, remolded plastic clay gouge; apparent orientation near horizontal.
77	409							
78	408							
79	407	7	5	100		ML		-High angle fracture at 78.7.
80	406							-High angle fracture at 79.7 feet.
81	405							
82	404					SM		Dense, damp, gray, very Silty, fine SANDSTONE. -4-inch, thick brown, clayey sandstone bed at 81.5 feet -High angle fracture at 81.5 feet.
83	403							
84	402	8	5	100				Hard, moist, gray, interbedded Silty CLAYSTONE and Clayey to fine, Sandy SILTSTONE.
85	401							
86	400							
87	399							
88	398							-High angle fracture at 87.5 feet.
89	397	8	5	100				
90	396							
91	395							
92	394					CL&ML		-High angle fracture at 92 feet.
93	393	9	4	100				
94	392							
95	391							
96	390							-Multiple fractures below 96 feet.
97	389							
98	388	9	4.5	100				
99	387							





**GEOCON**

## Log of Boring CC 2

Project No.: 06847-42-05  
Client:

Date: 8/5/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 486.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
								BORING TERMINATED AT 100 FEET Groundwater not encountered.



**GEOCON**

# Log of Boring CC 3

Project No.: 06847-42-05  
Client:

Date: 8/12/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 483.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
1	482							Boring cased to 9 feet.
2	481							
3	480							
4	479							
5	478							
6	477							
7	476							
8	475							
9	474							
10	473	1	2.5	0				<b>VERY OLD PARALIC DEPOSITS (Qvop)</b> Dense, damp, light brown to brown, Silty, fine to coarse SAND with gravel and cobble lenses.
11	472							
12	471							
13	470							
14	469	1	5	0				
15	468							
16	467							
17	466					SM		
18	465							
19	464	1	5	30				
20	463							
21	462							
22	461							
23	460	1	5	100				
24	459							



**GEOCON**

# Log of Boring CC 3

Projec No.: 06847-42-05  
Client:

Date: 8/12/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 483.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
26	457	1	5	100		SM		-Becomes orange brown below 25 feet.
27	456							
28	455	2	4	100				Dense, damp, brown, fine to coarse, Sandy GRAVEL with interbedded silty, fine to coarse sand lenses.
29	454							
30	453							
31	452	2	1	0				
32	451	2	1	100				
33	450	2	1.5	67				
34	449							
35	448	2	2.5	80				
36	447					GM		
37	446	2	1	50				
38	445							
39	444	2	2.5	60				
40	443							
41	442	2	1.5	67				
42	441	2	1	50				
43	440							
44	439	2	3	67				
45	438							
46	437	3	1	50				Dense, damp, light brown, Silty, fine to coarse SAND with some gravel interbeds.
47	436							
48	435	3	5	70		SM		
49	434							



**GEOCON**

# Log of Boring CC 3

Projec No.: 06847-42-05  
Client:

Date: 8/12/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 483.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
51	432	3	5	70		SM		
52	431							-Sharp contact.
53	430							Dense, damp, gray with orange mottling. Silty, fine SAND, micaceous.
54	429	3	5	90				
55	428							
56	427							-Becomes orange brown and fine- to medium-grained below 56 feet.
57	426							-12-inch thick, fine to coarse layer at 57 feet.
58	425							
59	424	4	5	100		SM		
60	423							-Becomes predominately gray with some orange staining below 60 feet.
61	422							
62	421							
63	420							
64	419	4	5	100				-Becomes orange brown and fine- to coarse-grained with gravel at 64 feet.
65	418							-Sharp contact.
66	417							<b>OTAY FORMATION (To)</b>
67	416					CL		Hard, moist, pale green, Silty, CLAYSTONE.
68	415							-Becomes gray-brown below 66.5 feet.
69	414	5	5	100				Hard, moist, gray, fine, Sandy SILTSTONE with some fractures at 68, 70.1 and 72.5 feet.
70	413							-Becomes sandier below 70 feet.
71	412							
72	411					ML		-Becomes clayey siltstone below 71.5.
73	410	5	5	100				
74	409							





**GEOCON**

# Log of Boring CC 3

Project No.: 06847-42-05  
Client:

Date: 8/12/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 483.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
76	407	5	5	100				Dense, damp, gray, Silty, fine SANDSTONE. -High angle fracture at 75.5 feet.
77	406							
78	405					SM		-Becomes very silty below 78 feet.
79	404	6	5	100				
80	403							
81	402							
82	401					CL		Hard, moist, brown with olive green mottling, Silty CLAYSTONE.
83	400							-Moderately fractured below 82.8 feet.
84	399	6	5	100				
85	398							Hard, damp, gray, fine, Sandy SILTSTONE with some silty claystone to clayey siltstone beds; moderately fractured between 84.5 and 86.5 feet.
86	397							
87	396							-Several high angle fractures below 86.5 feet.
88	395							
89	394	7	5	100				
90	393							
91	392					ML		
92	391							-Moderately fractured below 90.5.
93	390							
94	389	8	5	80				
95	388							
96	387							
97	386							
98	385	8	5	90				Hard, moist, olive brown and green, Silty CLAYSTONE with some fractures.
99	384					CL		-Becomes olive brown below 97.5 feet.



**GEOCON**

# Log of Boring CC 3

Projec No.: 06847-42-05  
Client:

Date: 8/12/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 483.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
101	382	8	5	90				
102	381							-Bedding Plane Shear Zone at 102 feet; zone of multiple of bedding plane shears up to 1/2-inch thick; soft, moist, green, highly remolded plastic clay gouge.
103	380							
104	379	9	5	100				-Bedding Plane Shear at 104 feet; 1/4-inch thick, soft, moist, green, continuous, highly remolded.
105	378							
106	377							
107	376							-Bedding Plane Shear at 107 feet; 1/4-inch thick, soft, moist, green, continuous, highly remolded.
108	375							
109	374	9	5	100				
110	373							
111	372							
112	371							-Bedding Plane Shear Zone between 111.5 and 111.8 feet; multiple 1/8 to 1/2-inch thick, soft, moist, gray-green, poorly remolded plastic clay gouge lenses.
113	370							
114	369	10	5	100				
115	368							
116	367							
117	366	10	2	50				
118	365							
119	364							
120	363	10	3	100				
121	362							
122	361							-Bedding Plane Shear-Zone from 122 to 123 feet; Multiple BPS up to 1/2-inch thick; soft, moist, green, highly remolded plastic clay gouge.
123	360	11	5	100				
124	359							-High angle fracture at 124 feet.



**GEOCON**

# Log of Boring CC 3

Project No.: 06847-42-05  
Client:

Date: 8/12/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 483.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
126	357	11	5	100		CL		
								BORING TERMINATED AT 126.5 FEET Groundwater not encountered.





**GEOCON**

# Log of Boring CC 4

Projec No.: 06847-42-05  
Client:

Date: 8/18/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 442.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
1	441							Boring cased to 4 feet.
2	440							
3	439							
4	438							
5	437	1	2	100				<b>VERY OLD PARALIC DEPOSITS (Qvop)</b> Dense, damp, brown, fine to coarse, Sandy GRAVEL with interbedded silty to clayey, fine to coarse sand.
6	436							
7	435							
8	434	1	3.5	43				
9	433							
10	432	1	1.5	67				
11	431							
12	430	1	2.5	80				
13	429							
14	428							
15	427	1	2.5	20			GM	
16	426							
17	425	1	2.5	60				
18	424							
19	423							
20	422	1	2.5	80				
21	421							-10-inch gravel bed at 23 feet.
22	420							
23	419	2	5	80				
24	418							





**GEOCON**

# Log of Boring CC 4

Projec No.: 06847-42-05  
Client:

Date: 8/18/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 442.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
26	416	2	5	80				Dense, damp, light brown with some orange staining, Silty, fine to medium SAND.
27	415							
28	414	2	5	100				-High angle fractures with dark brown clay infilling at 27.5 feet.
29	413							
30	412							
31	411					SM		
32	410							
33	409	3	5	100				
34	408							
35	407							
36	406							
37	405							
38	404	3	5	100		SP		Dense, wet, orange brown, fine to coarse SAND; low cohesion.
39	403							-Sharp contact.
40	402					SM		<b>OTAY FORMATION (To)</b> Dense, damp, pale greenish gray, Silty, fine SANDSTONE.
41	401							-18-inch thick, gray-green claystone and siltstone bed at 40 feet.
42	400							Hard/dense, damp, grayish brown, fine, Sandy SILTSTONE/Silty, fine SANDSTONE.
43	399	4	5	100				
44	398							
45	397							
46	396					ML/SM		
47	395							
48	394	4	5	100				
49	393							



**GEOCON**

# Log of Boring CC 4

Project No.: 06847-42-05  
Client:

Date: 8/18/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 442.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
51	391	4	5	100			xxxxx	-8-inch thick, grayish brown claystone bed at 50 feet.
52	390						xxxxx	
53	389	5	5	100			xxxxx	
54	388						xxxxx	-High angle fracture at 53.8 feet.
55	387						xxxxx	-20-inch thick, brown, silty claystone bed at 55 feet.
56	386						xxxxx	
57	385						xxxxx	-Moderately fractured below 57 feet.
58	384	6	5	100			xxxxx	
59	383						xxxxx	
60	382					ML/SN	xxxxx	
61	381						xxxxx	-4-inch thick, brown, silty claystone bed at 60.5 feet.
62	380						xxxxx	
63	379	6	5	100			xxxxx	
64	378						xxxxx	
65	377						xxxxx	
66	376						xxxxx	
67	375						xxxxx	High angle fracture between 67 and 67.5 feet.
68	374	7	5	100			xxxxx	
69	373						xxxxx	
70	372						xxxxx	Hard, moist, brown with green mottling, Silty CLAYSTONE with some clayey/sandy siltstone beds.
71	371						xxxxx	
72	370					CL	xxxxx	
73	369	7	5	100			xxxxx	
74	368						xxxxx	



**GEOCON**

# Log of Boring CC 4

Projec No.: 06847-42-05  
Client:

Date: 8/18/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 442.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
76	366	7	5	100			xxxxx	Hard/dense, damp, gray, fine to coarse, Sandy SILTSTONE to Silty, fine SANDSTONE.
77	365						xxxxx	-High angle fracture at 76 feet.
78	364	8	5	80			xxxxx	
79	363						xxxxx	
80	362						xxxxx	
81	361						xxxxx	
82	360					ML&S	xxxxx	
83	359	8	5	100			xxxxx	-High angle fracture with clay infilling at 82.5 feet.
84	358						xxxxx	
85	357						xxxxx	
86	356						xxxxx	-High angle fracture at 85.6 feet.
87	355						xxxxx	-Bedding Plane Shear at 86 feet; 1/8-inch thick, soft, moist, moderately remolded plastic clay gouge
88	354	9	5	100			xxxxx	-Moderately fractured below 86 feet.
89	353						xxxxx	
90	352					CL	xxxxx	Hard, moist, grayish brown, Silty CLAYSTONE; multiple fractures throughout.
91	351						xxxxx	
92	350						xxxxx	
93	349	9	5	100			xxxxx	Dense, damp, gray, Silty, fine SANDSTONE; moderately fractured between 92.5 and 93.2 feet.
94	348					SM	xxxxx	-High angle fracture at 93.8 feet.
95	347						xxxxx	
96	346						xxxxx	
97	345						xxxxx	Hard, moist, grayish brown, Silty CLAYSTONE.
98	344	10	5	100		CL	xxxxx	
99	343						xxxxx	-Fault between 98.3 and 98.7 feet; 4-inch thick zone of high angle fractures, fissuring and apparent slickensides with thin slightly remolded clay planes.





**GEOCON**

# Log of Boring CC 4

Project No.: 06847-42-05  
Client:

Date: 8/18/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 442.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
101	341	10	5	100				-Zone of waxy claystone with shimmery parting surfaces and fissuring; some paper thin remolded clay films; random orientation; no residual at 100 feet.
102	340							-10-inch thick, gray, clayey siltstone bed at 102 feet.
103	339	10	5	100				-High angle fracture at 103 feet.
104	338							
105	337							
106	336					CL		-Bedding Plane Shear at 106.2 feet; 1/4 to 1/2-inch thick, soft, moist, reddish brown, highly remolded plastic clay gouge with irregular thickness.
107	335							-16-inch thick, gray sandstone bed at 107.5 feet.
108	334	11	5	70				-Multiple fractures below 107.7 feet.
109	333							
110	332							
111	331							
112	330							
113	329	11	4	100				-Hard damp, gray, Clayey and fine, Sandy SILTSTONE.
114	328					ML		-High angle fracturing at 114 feet.
115	327							BORING TERMINATED AT 115 FEET Groundwater not encountered.



**GEOCON**

# Log of Boring CC 5

Projec No.: 06847-42-05  
Client:

Date: 8/24/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 436.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
1	435							<b>VERY OLD PARALIC DEPOSITS (Qvp)</b> Dense, damp to moist, brown, interbedded, Silty, fine to coarse SAND and fine to coarse, Sandy GRAVEL beds.
2	434							
3	433	1	5	40				
4	432							
5	431							
6	430							
7	429	1	2.5	60				
8	428							
9	427							
10	426	1	2.5	60				
11	425							
12	424							
13	423	1	5	80		SM&GL		
14	422							
15	421							
16	420							
17	419	1	2.5	60				
18	418							
19	417							
20	416	2	2.5	60				
21	415							
22	414							
23	413	2	5	80				
24	412							



**GEOCON**

# Log of Boring CC 5

Project No.: 06847-42-05  
Client:

Date: 8/24/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 436.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
26	410	2	5	80				
27	409							
28	408	2	5	100				
29	407							-Becomes orange brown between 29 and 31 feet.
30	406							
31	405							
32	404	3	2	100				
33	403							
34	402	3	1	100				
35	401	3	2	75		SM&G		
36	400							
37	399	3	2.5	100				
38	398							
39	397	3	1	100				
40	396	3	1.5	100				
41	395							
42	394	4	1.5	100				
43	393	4	.75	67				
44	392							
45	391	4	2.75	91				Dense, damp, light brown with orange staining, Silty, fine SAND.
46	390							
47	389					SM		-Becomes greenish gray with orange staining below 46 feet.
48	388	5	5	60				
49	387							





**GEOCON**

# Log of Boring CC 5

Projec No.: 06847-42-05  
Client:

Date: 8/24/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 436.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
51	385	5	5	60				
52	384							
53	383	5	5	100				
54	382							
55	381							
56	380							
57	379					SM		
58	378	5	5	100				
59	377							
60	376							
61	375							-Becomes fine to coarse between 61 and 63.5 feet.
62	374							
63	373	6	5	90				
64	372							
65	371							<b>OTAY FORMATION (To)</b>
66	370							Hard/dense, damp, pale grayish brown, fine Sandy SILTSTONE and Silty, fine SANDSTONE.
67	369							
68	368	6	5	100		ML&SM		
69	367							
70	366							
71	365							Hard, moist, grayish brown, Silty CLAYSTONE.
72	364							
73	363	7	5	100		CL		
74	362							



**GEOCON**

# Log of Boring CC 5

Projec No.: 06847-42-05  
Client:

Date: 8/24/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 436.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
76	360	7	5	100				-2-foot thick, siltstone/sandstone bed at 75 feet.
77	359							
78	358	7	5	100		CL		-High angle fracture at 77.5 feet.
79	357							-14-inch thick, siltstone/sandstone bed at 79 feet.
80	356							
81	355							-Fracturing below 80.5 feet
82	354							-Becomes mottled brown and olive green below 80.5 feet.
83	353	8	5	100				-4-inch thick, fine sandstone bed at 81.5 feet.
84	352							-Becomes waxy below with high angle fracture at 82 feet.
85	351							Hard/dense, damp, gray, fine, Sandy SILTSTONE and Silty, fine SANDSTONE.
86	350							
87	349					ML&SL		-14-inch claystone bed at 86 feet with <b>Poorly Developed Bedding Plane Shear</b> ;
88	348	8	5	100				1/8-inch thick, poorly remolded plastic clay gouge.
89	347							
90	346							-Moderately fractured at 90 feet.
91	345							
92	344							Hard, moist, grayish brown, Silty CLAYSTONE with some interbedded siltstone beds.
93	343	9	5	100				
94	342							
95	341							-10-inch thick, <b>unsheared, hard bentonite bed</b> at 94.3 feet.
96	340							-8-inch siltstone bed at 95.5 feet.
97	339							
98	338	9	5	100				-Several high angle fractures below 97.5 feet.
99	337							





**GEOCON**

# Log of Boring CC 5

Projec No.: 06847-42-05  
Client:

Date: 8/24/21  
Drilling Company: CASCADE  
Excavation Method:  
Boring Diameter: inches  
Elevation: 436.0 feet above MSL  
Geologist: T. REIST

Location:

Depth (Feet)	Elevation MSL (Feet)	Box	Run	% Rec	Recovery	USCS Class	Lithology	Material Description
101	335	9	5	100		CL		
102	334							Dense, moist, gray, Silty, fine SANDSTONE.
103	333	10	4	100		SM		
104	332							-High angle fracture at 103.4 feet. -Grades into a clayey siltstone below 103.5 feet.
105	331							BORING TERMINATED AT 105 FEET Groundwater not encountered.



CC1-1:9'-25'

Qt

11.5

16.5

21.5

25



CC1-2:26'-40'

26.5

30

36.5

40



CC1-3:41'-51.5'

41.5

46.5

44.5

45.5

51.5



CC1-4:51.6'-61.5'

56.5

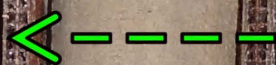
61.5



CC1-5: 61.6' - 71.5'

Qt

To



66.5

71.5



CC1-6:71.6'-76.5'

76.5



CC2-1:9'-21'

Qt

15

16

11.4

21



CC2-2:21'-31'



26

28

31



CC2-3:31'-41'

36

37

41



CC2-4:41'-51'

46

51



CC2-5:51'-60'

60

56



CC2-6: 60' - 69.5

Qt

----- Fractures

-----

To

-----

61

67.5

66



CC2-7: 69.6' - 79.5'

76.5

Sheared Bedding Plane @ 75'

71.5

High Angle Fractures





CC2-8

1/8"-thick Sheared Bedding Plane @75'





CC2-9

Sheared Bedding Plane @75'





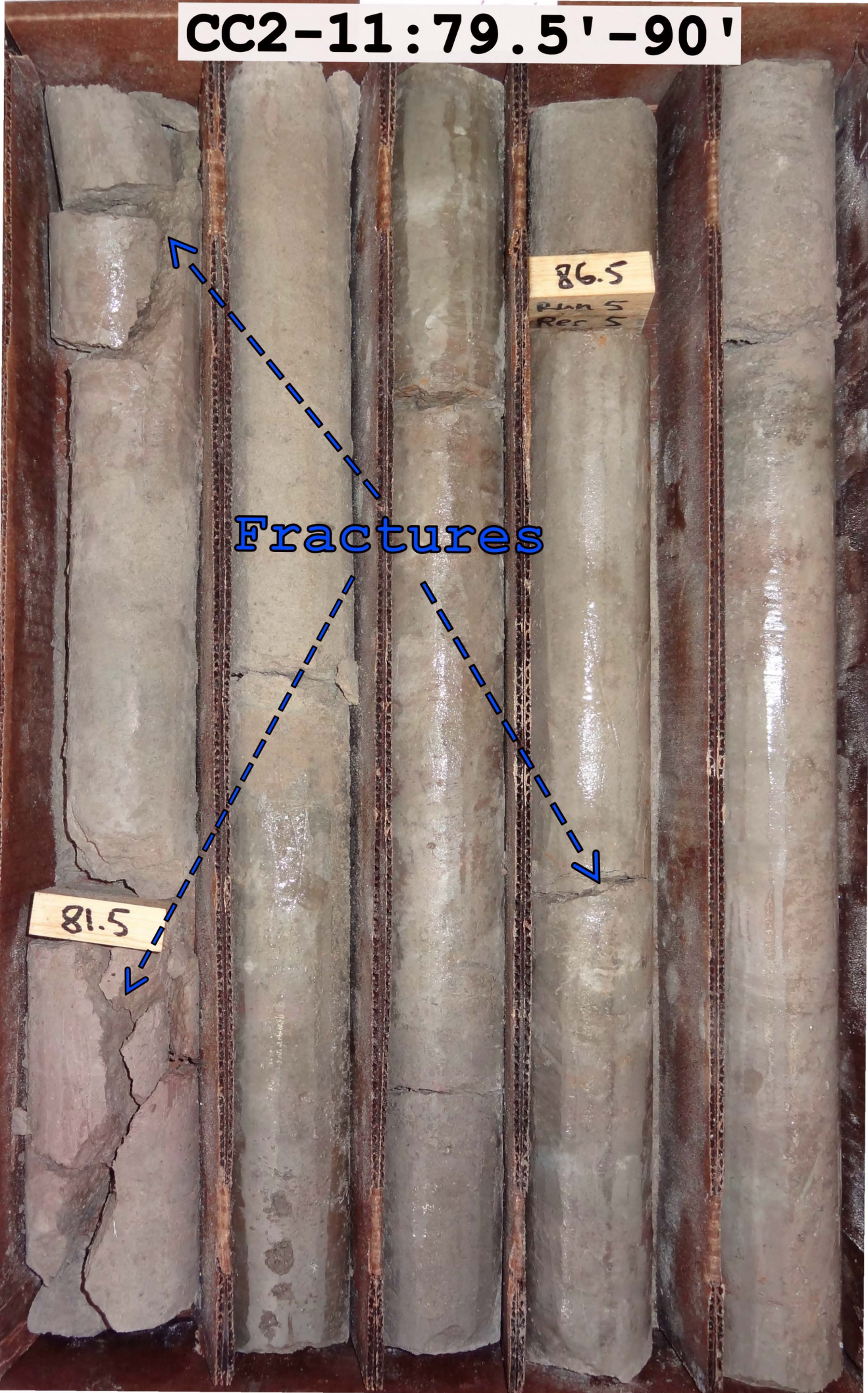
CC2-10

Sheared Bedding Plane @75'





**CC2-11:79.5'-90'**



86.5

Run 5  
Rec 5

Fractures

81.5



CC2-12:90'-100'

Fractured

91.5

100



CC3-1:16.5'-30'

11.5

16.5

Run 5

Qt

26.5

21.5





CC3-2:30-45.5



30.5

31.5

37½

41.5

32.5

42.5

34

36.5

40

45.5



CC3-3:45.6'-56.5'

46.5

51.5

56.5



CC3-4:56.6'-66.5



Qt



To

61.5

66.5



CC3-5: 66.6' - 76.5'

71.5



High Angle Fracture



Fracture

76.5





CC3-6:76.6'-86.5

Fractured

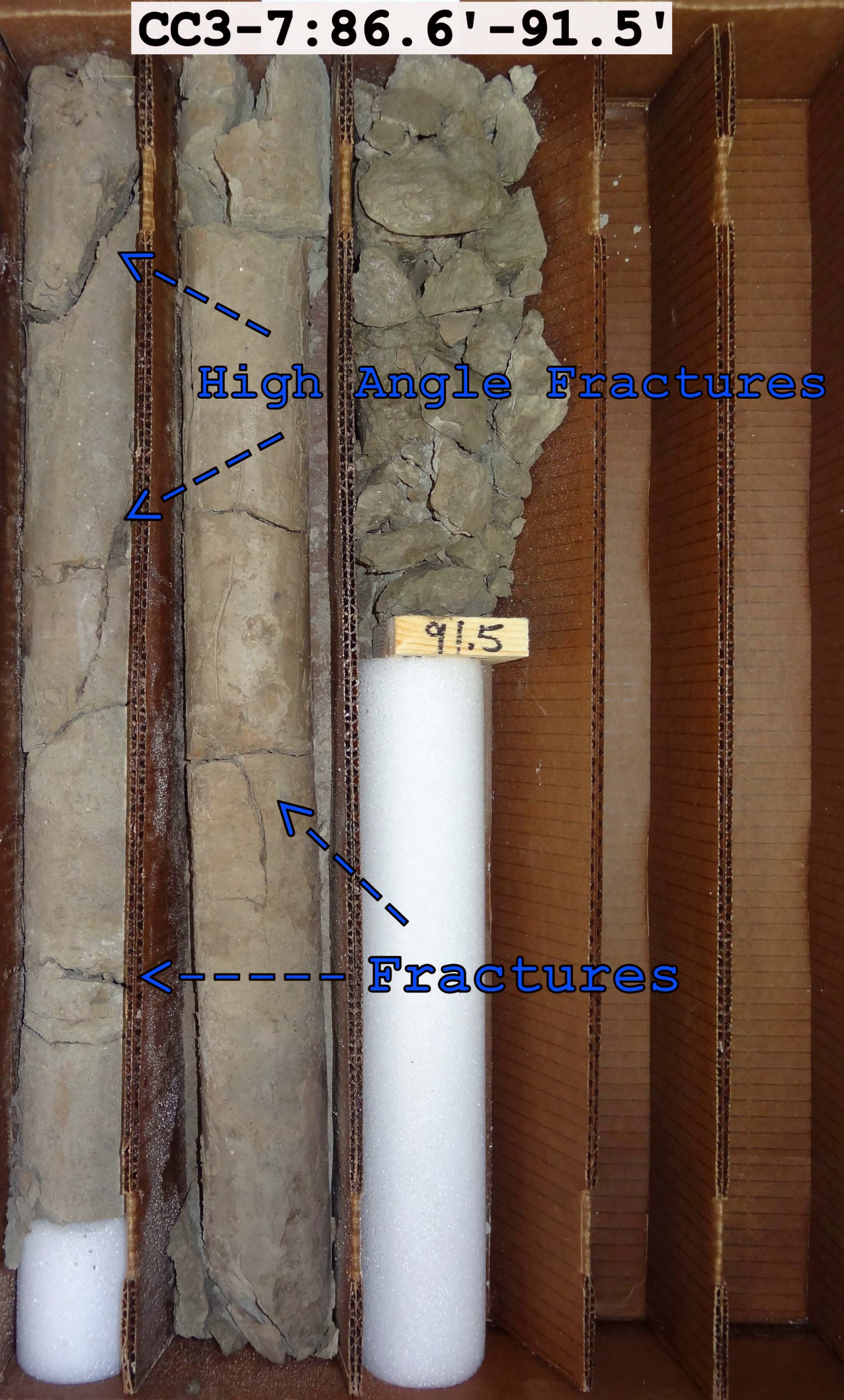
81.5

Fractured

86.5



CC3-7:86.6'-91.5'



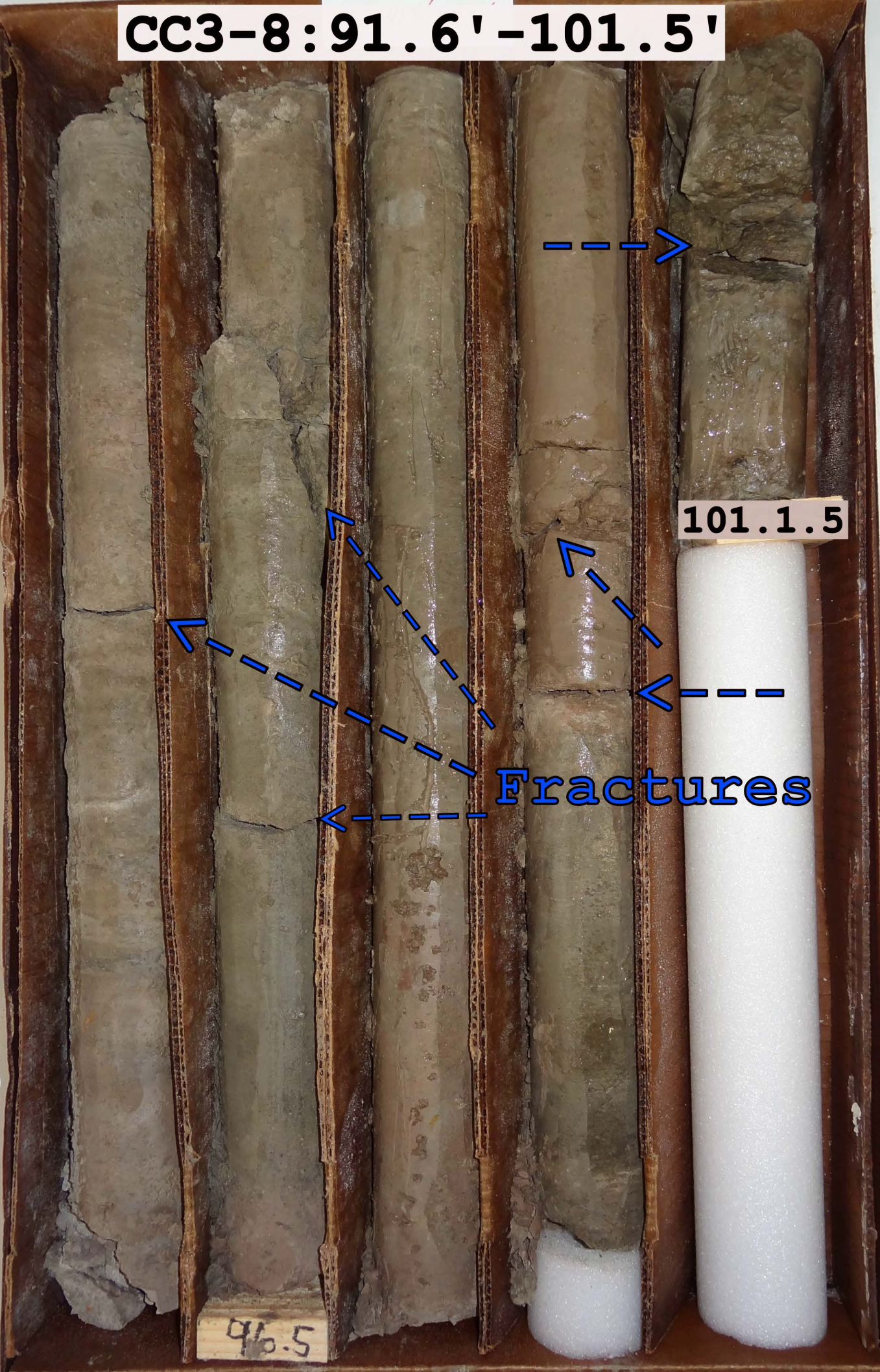
High Angle Fractures

91.5

Fractures



CC3-8:91.6'-101.5'



101.1.5

Fractures

96.5



**CC3-9:101.6'-110.5'**

**Multiple Bedding Plane Shears**



**104**



**Sheared Bedding Planes**



**107**





**CC3-10**

**Sheared Bedding Plane @107'**



**107**



**CC3-11**

**Multiple Sheared Bedding Planes @102'**





**CC3-12**

**Multiple Sheared Bedding Planes @102'**





**CC3-13**

Sheared Bedding Plane @ 104'



**104**



CC3-14

Remolded Clay @ 104'





CC3-15

Remolded Clay @ 104'





CC3-16

Remolded Clay @104'





CC3-17

Remolded Clay @104'





CC3-18:110.6'-121.5



Bedding Plane Shears

Fractured



CC3-19



Sheared Bedding Planes



**CC3-20**

Remolded Clay Gouge @111.8'





**CC3-21**

Remolded Clay Gouge @111.8'





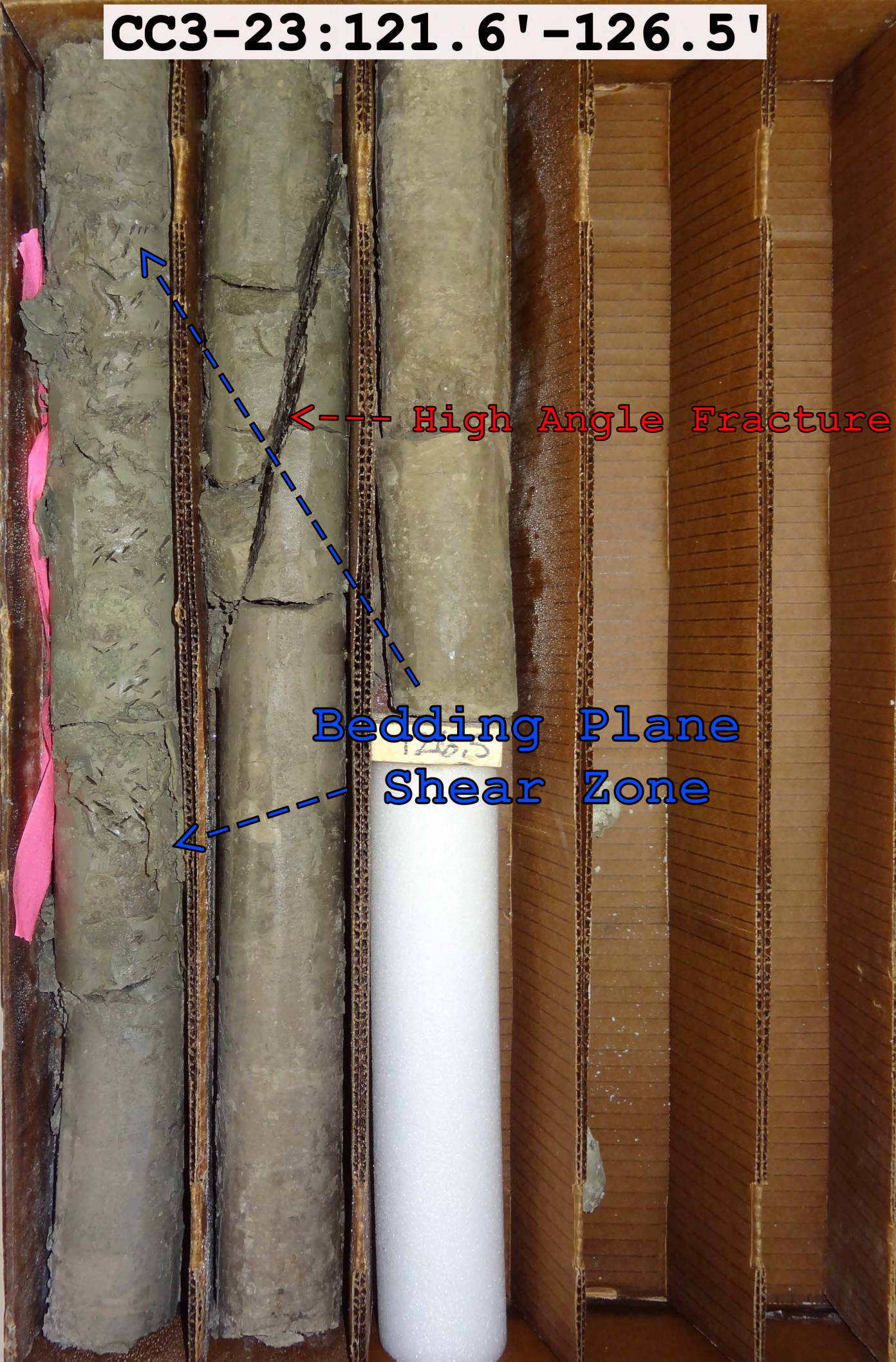
**CC3-22**

Remolded Clay Gouge @111.8





CC3-23:121.6'-126.5'



High Angle Fracture

Bedding Plane  
Shear Zone



CC3-24

Bedding Plane Shear Zone 122'-123'

126.5

Shear Zone



CC4-1:4'-21'

Qt



6

11

13.5

18.5

21



CC4-2:21'-31'





CC4-3:31'-41'

36

Qt

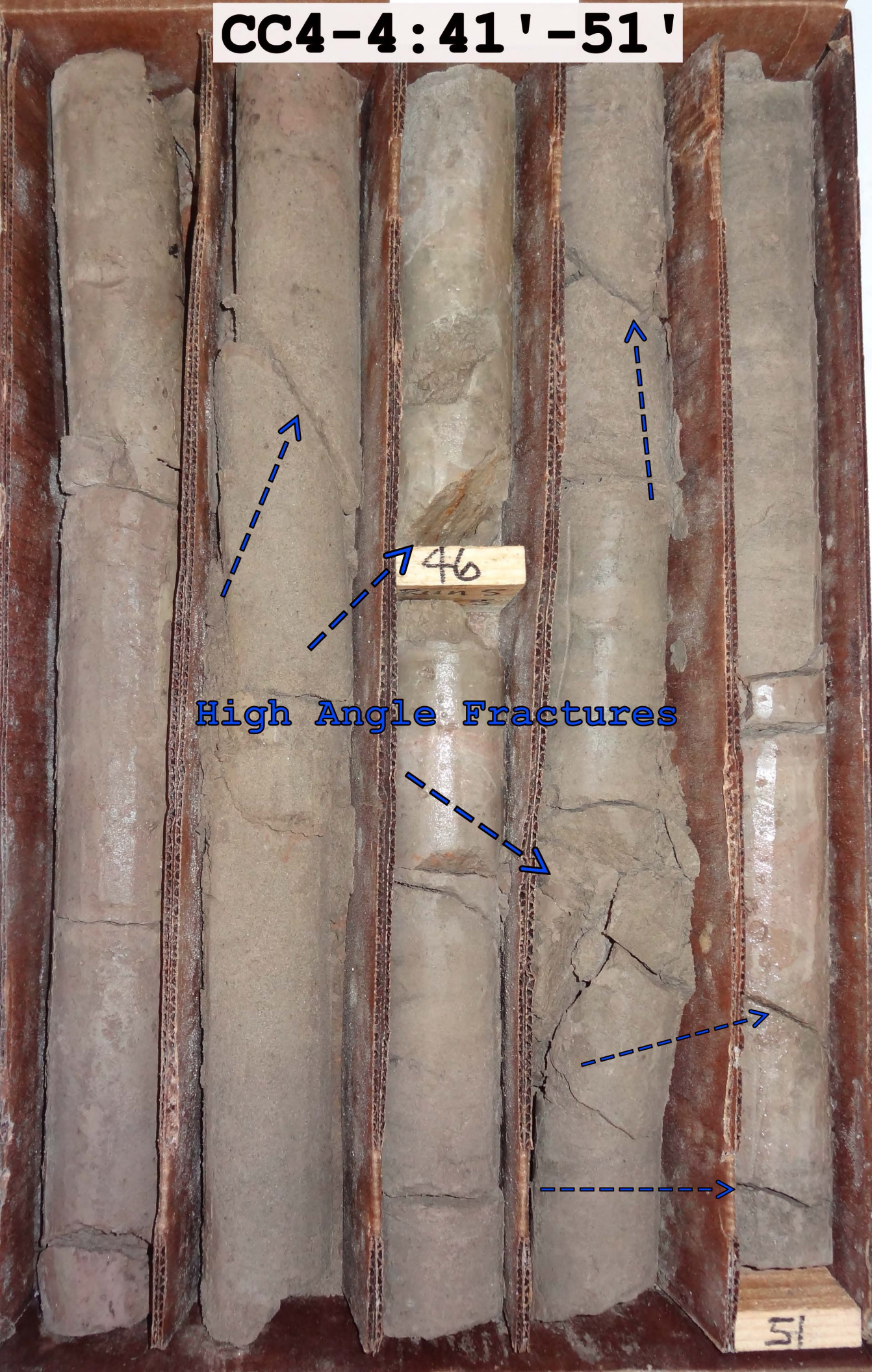


To

41



**CC4-4:41'-51'**



**High Angle Fractures**



CC4-5:51'-56'

56

Fractured



**CC4-6:56'-66'**

61

Run 5  
Rel 5

Fractured

66



CC4-7: 66'-76'

Fractured

71

76



CC4-8:76'-86'

Fractured

86

81



CC4-9:86'-95'

Bedding Plane Shear @ 86'

Fractured

91



CC4-10

Sheared Clay

CC4-87-95

Bedding Plane Shear @ 86'





CC4-11

Remolded Clay

Bedding Plane Shear @ 86'





CC4-12:95'-105'

Highly Fractured

96

Fault

98.3'-98.7'

101



CC4-13

Fault 98.3'-98.7'

CC4:96-105





CC4-14

Fault 98.3'-98.7'

CC4:96-105





**C4-15**

Fault 98.3'-98.7'





CC4-16

Fault 98.3'-98.7'





CC4-17

Fault 98.3'-98.7'



CC4-18

Fault 98.3'-98.7'



**CC4-19**

Fault 98.3'-98.7'





**CC4-20**

Fault 98.3'-98.7'





CC4-21

Fault 98.3'-98.7'

Margin

FAULT

Margin

101

Run 5  
Rec 4  
96



CC4-22

Fault 98.3'-98.7'

Margin



Margin





CC4-23

Fault 98.3'-98.7'

Fault Margin



Thin slightly Remolded Clay Planes





CC4-24

Fault 98.3'-98.7'

←----- Margin

↑  
Margin

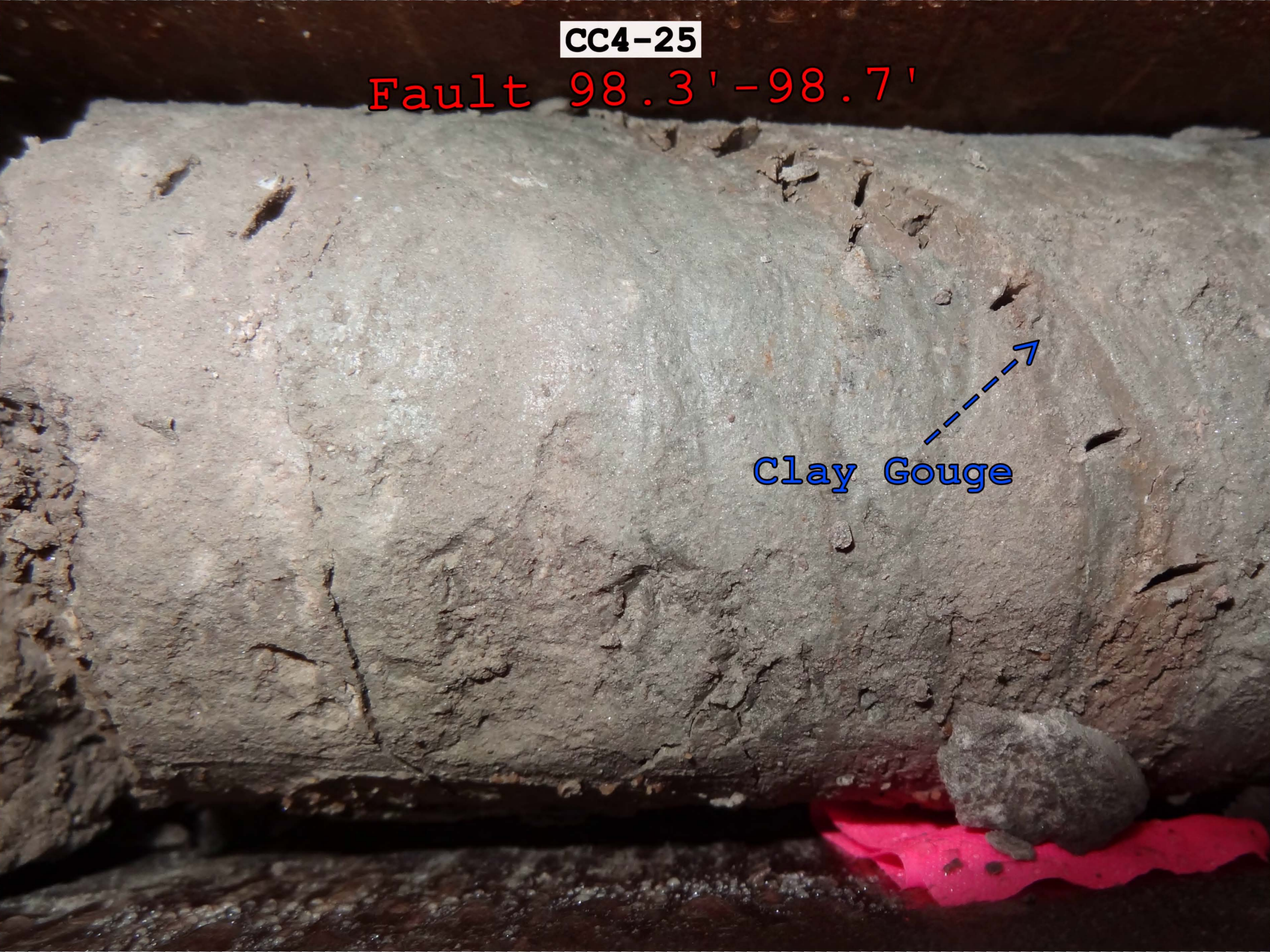




CC4-25

Fault 98.3'-98.7'

Clay Gouge





CC4-26

Fault 98.3'-98.7'

Clay Gouge





CC4-27

Fault 98.3'-98.7'

Apparent Slickensides





CC4-28

Fault 98.3'-98.7'

Apparent Slickensides





Fault 98.3'-98.7'

CC4-29

Apparent Slickensides





CC4-30

Fault 98.3'-98.7'

Clay Gouge

Margin





CC4-31

Fault 98.3'-98.7'

Clay Gouge

Margin ----->

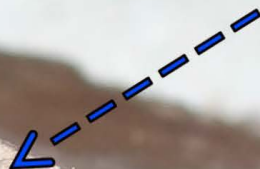




CC4-32

Fault 98.3'-98.7'

Clay Gouge



Margin

