

# Log of Boring No. BRC-SB-16-B

## BMI Site - Hydrogeologic Characterization

### Henderson, Nevada



**Drilling Method:** Rotary Sonic  
**Drilling Equipment:** Rotary Sonic  
**Drilling Contractor:** Prosonic Corporation  
**Driller:** Gerardo Chavez

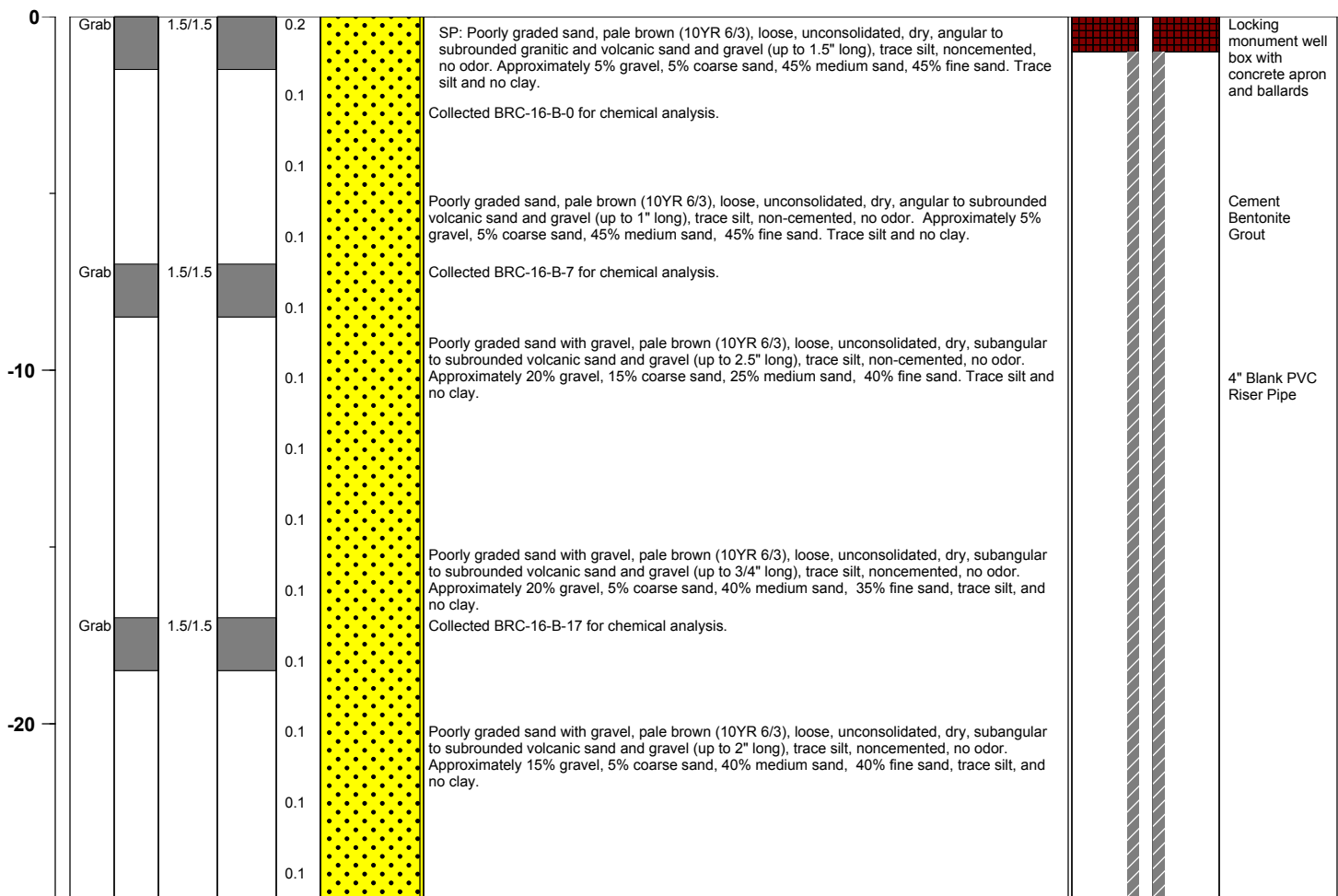
**Borehole Total Depth:** 368.5 ft bgs  
**Borehole Diameter:** 9.5 in to 97 ft, 8.5 in to 367 ft bgs  
**Boring Location:** Location 16 (Well ID: MCF-16B)  
**Depth to Water (ft. bgs):** 57.5 ft bgs

**Sample Type:** Split spoon  
**Sample Interval:** 5 ft

**Logged By:** Jennifer Wiley  
**Date Started:** 5/23/04  
**Date Completed:** 5/27/04

Monitoring Well Construction			
<b>Type of Surface Seal:</b>	Bentonite Grout	<b>Screen Slot Size:</b>	0.010 in
<b>Blank Casing Type/Size:</b>	4" Sch 80 PVC	<b>Top of Screen (ft. bgs):</b>	283.7
<b>Screen Type/Size:</b>	4" Sch 80 PVC	<b>Bottom of Screen (ft. bgs):</b>	313.7 ft bgs
<b>Transition Sand Type:</b>	N/A	<b>Type of Sand Pack:</b>	#2 x 12

Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
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**Project No.** 3850360

**Log of Boring:** BRC-SB-16-B



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Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
	Grab	1.5/1.5					<p>Poorly graded sand with gravel, pale brown (10YR 6/3), loose, unconsolidated, dry, subangular to subrounded volcanic sand and gravel (up to 1.5" long), trace silt, noncemented, no odor. Approximately 20% gravel, 10% coarse sand, 20% medium sand, 45% fine sand, 5% silt, and no clay.</p> <p>SW: Well graded sand, pale brown (10YR 6/3), loose, unconsolidated, dry, subangular to subrounded volcanic sand and gravel (up to 3/4" long), trace silt, noncemented, no odor. Approximately 10% gravel, 30% coarse sand, 30% medium sand, 25% fine sand, 5% silt, and no clay.</p> <p>Cleaning out sluff in hole. Collected BRC-16-B-27 for chemical analysis.</p> <p>SP: Poorly graded sand, pale brown (10YR 6/3), loose, unconsolidated, dry, subangular to subrounded volcanic sand and gravel (up to 1" long), noncemented, no odor. Approximately 10% gravel, 15% coarse sand, 30% medium sand, 40% fine sand, 5% silt, and no clay.</p> <p>SW: Well graded sand, pale brown (10YR 6/3), loose, unconsolidated, dry, subangular to subrounded volcanic sand and gravel (up to 1" long), noncemented, no odor. Approximately 5% gravel, 30% coarse sand, 30% medium sand, 30% fine sand, 5% silt, and no clay.</p> <p>SM: Poorly graded silty sand, pale brown (10YR 6/3), loose, unconsolidated, dry, subangular to subrounded volcanic sand and gravel (to 3/4" long), noncemented. Approximately 5% gravel, 5% coarse sand, 15% medium sand, 60% fine sand, 15% silt, and no clay.</p> <p>GP: Poorly graded gravel with sand, pale brown (10YR 6/3), loose, unconsolidated, dry, subangular to subrounded volcanic sand and gravel (up to 1.5" long), noncemented, no odor. Approximately 60% gravel, 10% coarse sand, 20% medium sand, 10% fine sand, trace silt, and no clay.</p> <p>SM: Poorly graded silty sand (as at 38' bgs). Approximately 5% gravel, 5% coarse sand, 15% medium sand, 60% fine sand, and 15% silt.</p> <p>GP: Poorly graded gravel with sand, pale brown (10YR 6/3), loose, unconsolidated, dry, subangular to subrounded volcanic sand and gravel (up to 1.5" long), noncemented, no odor. Approximately 60% gravel, 10% coarse sand, 20% medium sand, 10% fine sand, trace silt, and no clay.</p> <p>ML: Silt, brown (7.5YR 4/3), hard, dry to moist, moderate to strong induration, broken in to smaller sand to gravel-sized siltstone chips/fragments, low plasticity, no odor. Approximately 100% silt.</p> <p>Collected BRC-16-B-47 for chemical analysis.</p> <p>Silt, brown (7.5YR 5/4), very stiff, moderate induration, broken in to smaller silt chips/fragments, low plasticity, no odor. Approximately 100% silt.</p> <p>At 53', trace areas of very thin to thin fissile layers; crumbly.</p> <p>Silt with clay and sand, brown (7.5YR 5/3), stiff, very moist to wet in areas, fine sand, noncemented, no odor, low to medium plasticity. Approximately 15% fine sand, 70% silt, and 15% clay.</p> <p>Collected BRC-16-B-57.5 (saturated soil sample) for NEL.</p>	<p>4" Blank PVC Riser Pipe</p> <p>Cement Bentonite Grout</p>

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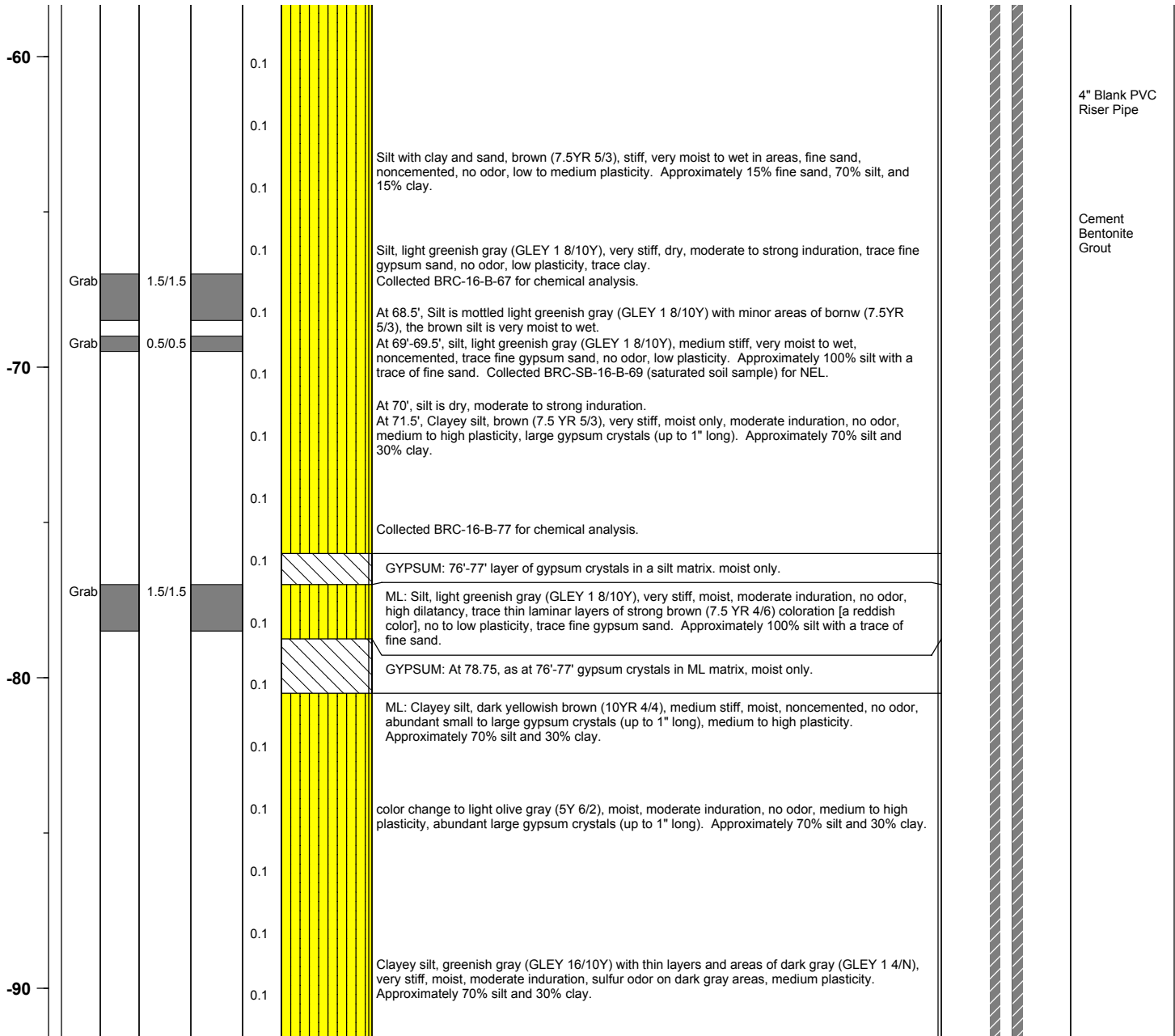
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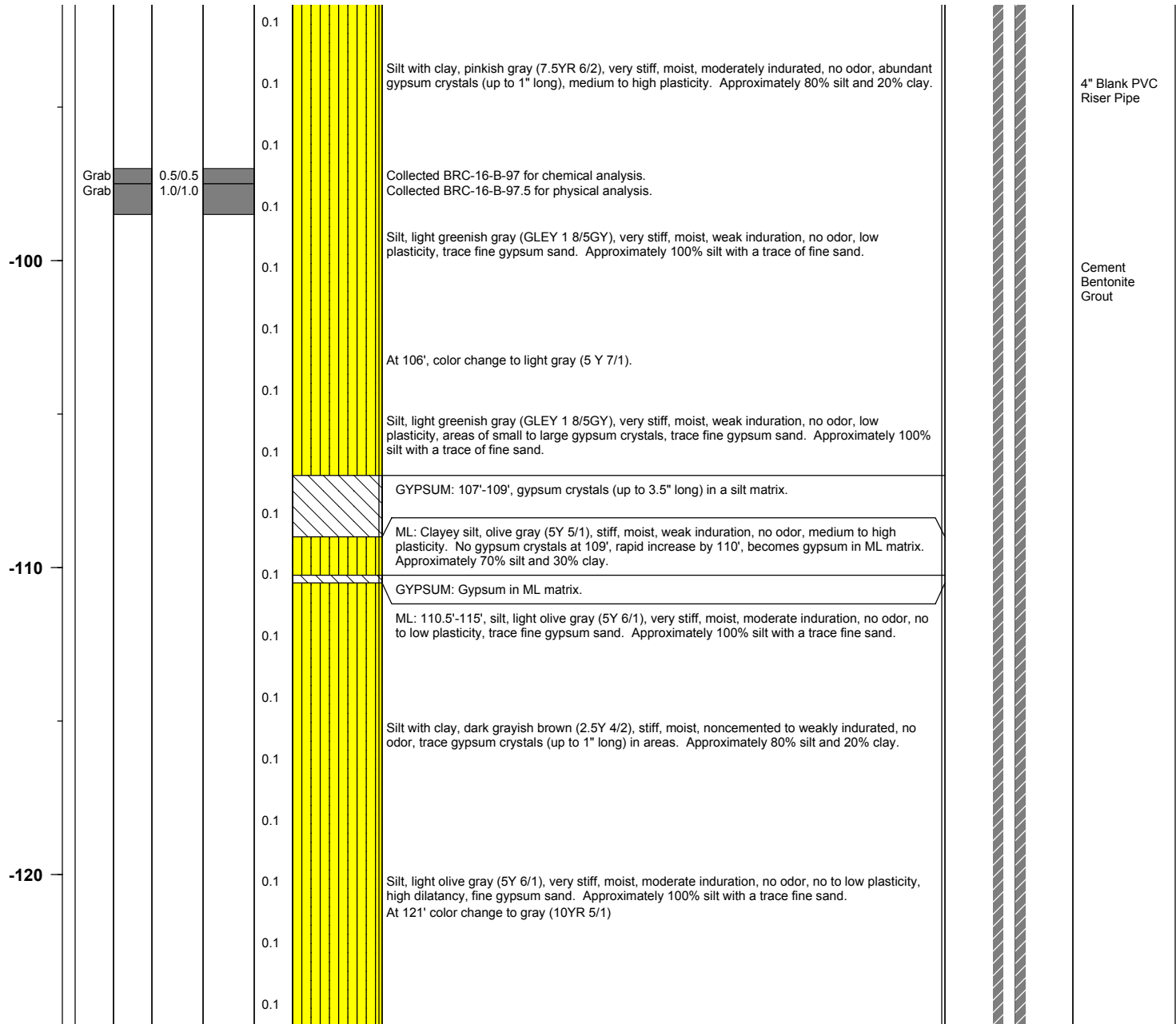
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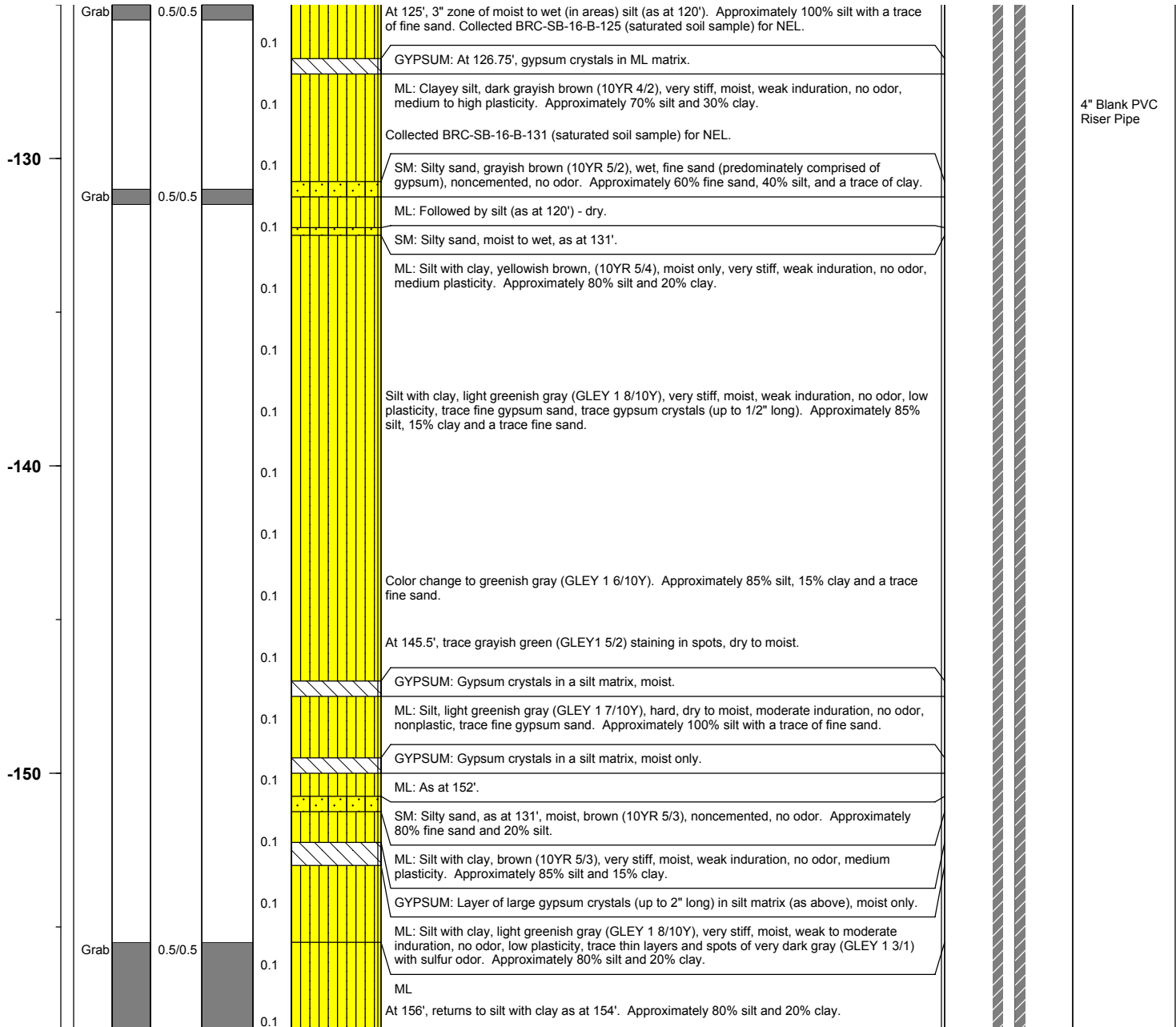
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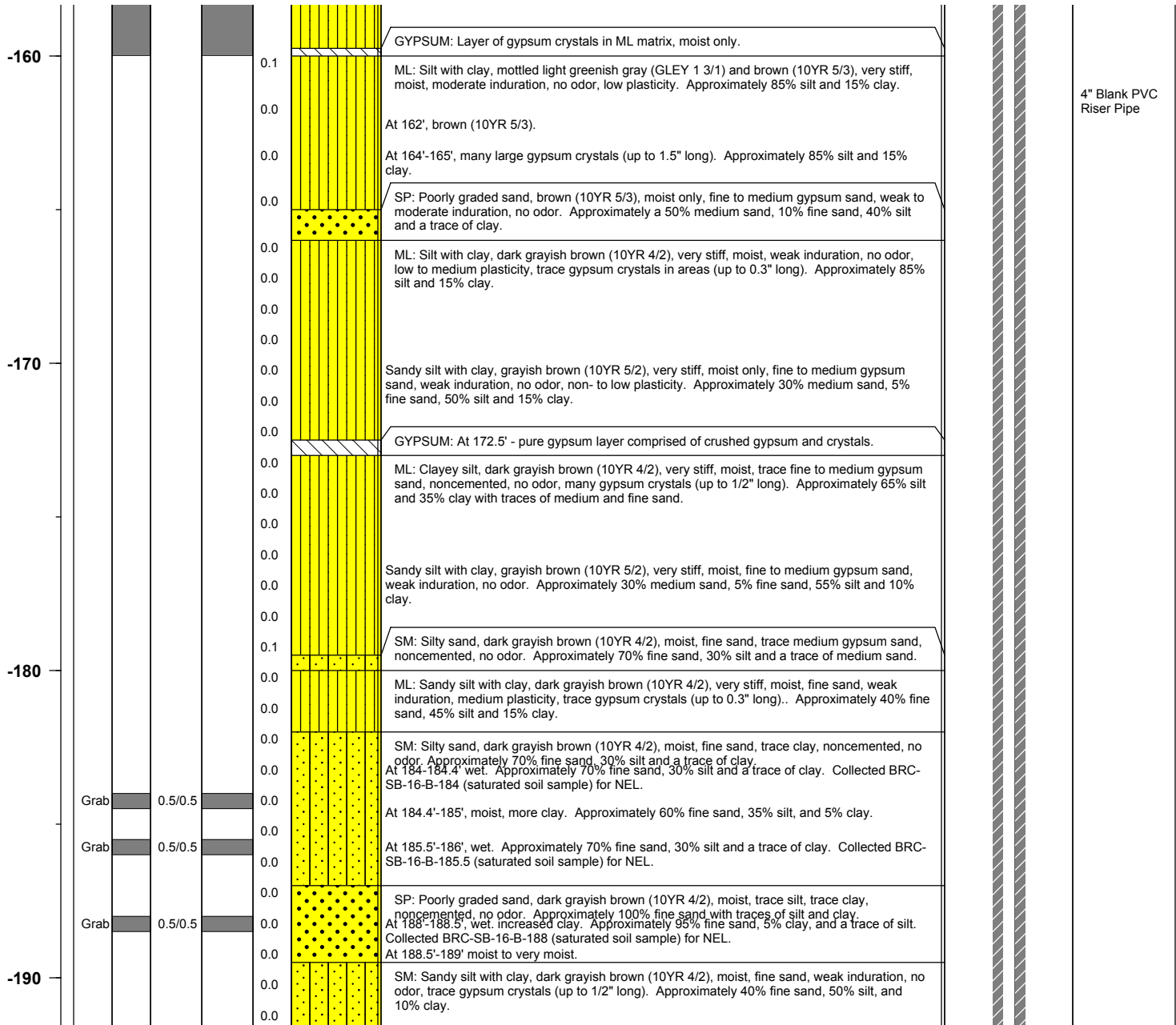
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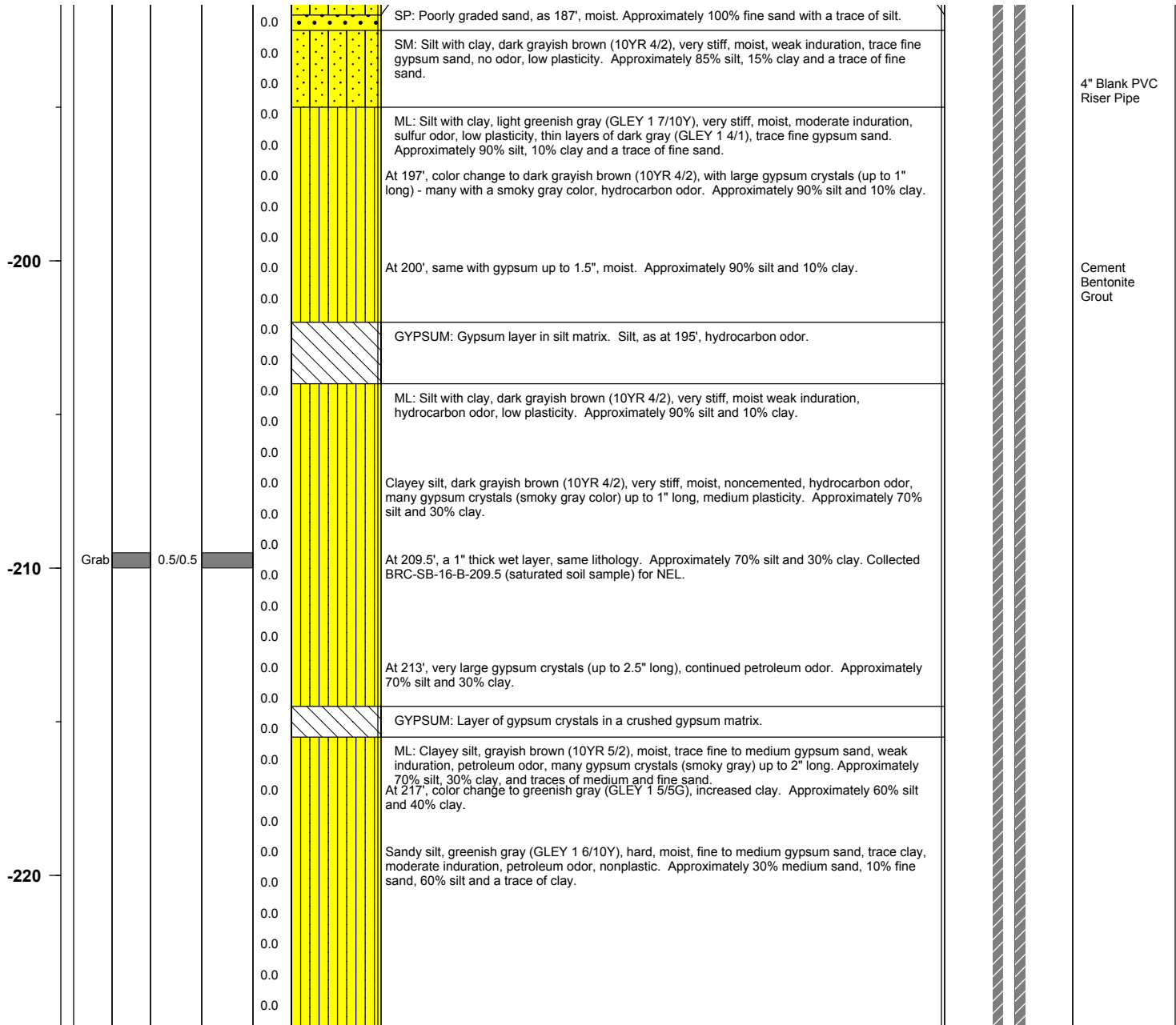
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Log of Boring: BRC-SB-16-B



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Henderson, Nevada



Log of Boring No. BRC-SB-16-B

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-230	Grab	0.5/0.5			0.0		Collected BRC-SB-16-B-225.5 (saturated soil sample) for NEL.	4" Blank PVC Riser Pipe
					0.0		Sandy silt, greenish gray (GLEY 1 5/5G), very stiff, moist (wet 3" at 225.5), fine to coarse gypsum sand, weak induration, petroleum odor, nonplastic. Trace thin black (GLEY 1 2.5/N) layers with sulfur/petroleum odor, many gypsum crystals. Approximately 10% coarse sand, 20% medium sand, 10% fine sand, and 60% silt.	
					0.0			
					0.0			
					0.0			
					0.0			
					0.0			
					0.0			
					0.0			
					0.0			
-240					0.0		Clayey silt, mottled colors and in laminar layers: light greenish gray (GLEY 1 8/10Y), gray (GLEY 1 5/N), and black (GLEY 1 2.5/N). Black layers correspond with gypsum-rich (up to 2" long and smoky gray to smoky brown layers, medium stiff to stiff, moist, noncemented, strong petroleum odor, medium plasticity. Deep brown stained spots within laminar layers at 232.5', 233.5', and 235'. Laminar layers between 4mm and 1 inch thick. Approximately 60% silt and 40% clay.	Cement Bentonite Grout
					0.0			
					0.0			
					0.0			
					0.0			
					0.0			
					0.0			
					0.0			
					0.0			
					0.0			
-250					0.0		At 235', no change, slightly more silt. Approximately 70% silt and 30% clay.	
					0.0			
					0.0			
					0.0			
					0.0			
					0.0			
					0.0			
					0.0			
					0.0			
					0.0			
	Grab	0.5/0.5			0.0		Silt with clay, greenish gray (GLEY 1 5/10Y), stiff, moist, trace fine to medium gypsum sand, weak induration, strong petroleum odor, low plasticity, few gypsum crystals up to 2.5" long (smoky) very thin (1-2 mm) laminations. Approximately 85% silt, 15% clay with traces of fine and medium sand.	
					0.0			
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					0.0			
	Grab	0.5/0.5			0.0		Silt with clay, mottled greenish gray (GLEY 1 5/10Y) and very dark gray (GLEY 1 3/N) with areas of very thin laminations (1-2mm), stiff, moist, trace fine to medium gypsum sand, weak induration, strong petroleum odor, low plasticity, few gypsum crystals up to 1" long. Approximately 80% silt, 20% clay with traces of fine and medium sand.	
					0.0		At 247' a 1.5" thick wet zone, same lithology. Collected BRC-SB-16-B-247 (saturated soil sample) for NEL.	
	Grab	0.5/0.5			0.0		At 248.5' a 2.5" thick wet (saturated) zone, same lithology. Collected BRC-SB-16-B-248.5 (saturated soil sample) for NEL.	
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	Grab	0.5/0.5			0.0		Clayey silt, dark mottled greenish gray (GLEY 1 5/10Y) and very dark gray (GLEY 1 3/N) with areas of very thin laminations (1-4mm), stiff, moist, trace fine to medium gypsum sand, weak induration, strong petroleum odor, low plasticity, few gypsum crystals up to 1/2" long. Approximately 70% silt and 30% clay with traces of fine and medium sand.	
					0.0		Collected BRC-SB-16-B-252 (saturated soil sample) for NEL.	
					0.0			
					0.0			
					0.0			
					0.0			
					0.0			
					0.0			
					0.0			
					0.0			
					0.0		Sandy silt, mottled/laminations as above, very stiff, moist, weakly indurated, strong petroleum odor, nonplastic, fine to medium gypsum sand, trace clay. Approximately 30% medium sand, 10% fine sand, 60% silt and a trace of clay.	
					0.0			
					0.0			
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					0.0			
					0.0			
					0.0			
					0.0			
					0.0		GYPSUM: Gypsum crystals in silt matrix.	
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					0.0			
					0.0			
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					0.0		ML: Sandy silt (as above), moist. Approximately 30% medium sand, 10% fine sand, 60% silt and a trace clay.	
					0.0			
					0.0			
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					0.0			
					0.0			
					0.0		GYPSUM: Gypsum crystals in silt matrix.	
					0.0			
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-260							ML: Sandy silt (as above), moist.	
							Silty with clay, greenish gray (GLEY 1 5/10GY), very stiff, moist, trace fine to medium gypsum sand, weak to nonindurated, petroleum odor, low plasticity, many gypsum crystals (up to 1") in areas. Approximately 85% silt, 15% clay with traces of fine and medium sand.	4" Blank PVC Riser Pipe
							Silt with clay, (as above), moist, fewer large gypsum crystals. Approximately 85% silt, 15% clay with a trace of fine sand.	
	Grab	0.5/0.5					SM: At 266.5', a 3" zone of silty sand, moist to wet. Approximately 60% fine sand and 40% silt. Collected BRC-SB-16-B-266.5 (saturated soil sample) for NEL.	Cement Bentonite Grout
							ML: As at 265'.	
-270							GYPSUM: Pure gypsum crystals in a crushed gypsum matrix. Approximately 60% silt and 40% clay.	
							ML: Clayey silt, light greenish gray (GLEY 1 7/5G), stiff, moist, noncemented, petroleum odor, medium to high plasticity, areas of large gypsum crystals (up to 2.5" long).	
							GYPSUM: Pure gypsum crystals in a crushed gypsum matrix.	
	Grab	0.5/0.5					At 273.5', 1" thick muddy layer (ML). Collected BRC-SB-16-B-273.5 (saturated soil sample) for NEL.	
							ML: Clayey silt, light greenish gray (GLEY 1 7/5G), stiff, moist, non to weakly indurated, weak petroleum odor, medium to high plasticity, areas of large gypsum crystals (up to 1.5"). Approximately 60% silt and 40% clay.	
							At 277'-279.5', abundant gypsum crystals comprising between 25%-60% of the cores.	Bentonite seal
							Collected BRC-SB-16-B-279.5 (saturated soil sample) for NEL.	
-280	Grab	0.5/0.5					GYPSUM: At 279.5'-280', 6" zone of 85% crystals in ML, wet (saturated).	
							ML: Clayey silt, dark grayish brown (10YR 4/2), very stiff, moist, noncemented, faint petroleum odor, medium plasticity, with gypsum crystals. Approximately 70% silt and 30% clay.	
	Grab	0.5/0.5					At 281.5', a 2" muddy zone, wet (saturated). Collected BRC-SB-16-B-281.5 (saturated soil sample) for NEL.	#10 x 20 Sand Pack
							GYPSUM: At 285'-285.5', 6" zone of 85% crystals in ML matrix, wet (saturated). Collected BRC-SB-16-B-285 (saturated soil sample) for NEL.	
	Grab	0.5/0.5					ML: Clayey silt, very dark grayish brown (10YR 3/2), stiff, moist with trace wet inclusions (mud), noncemented, faint petroleum odor, medium plasticity, with gypsum crystals.	4" 0.010 Slot PVC screen
							Silty with clay, light greenish gray (GLEY 1 7/10GY), very stiff, moist, non to weak induration, faint petroleum odor, low plasticity. Approximately 90% silt and 10% clay.	
	Grab	0.5/0.5					At 288.5', 2" muddy zone, wet (saturated), ML, afterwards moist to very moist in areas. Collected BRC-SB-16-B-288.5 (saturated soil sample) for NEL.	
-290							At 290.5-291', stringers of wet mud, ML. Collected BRC-SB-16-B-290.5 (saturated soil sample) for NEL.	
	Grab	0.5/0.5					Clayey silt, greenish gray (GLEY 1 6/5GY), moist, stiff, petroleum odor, noncemented, medium	

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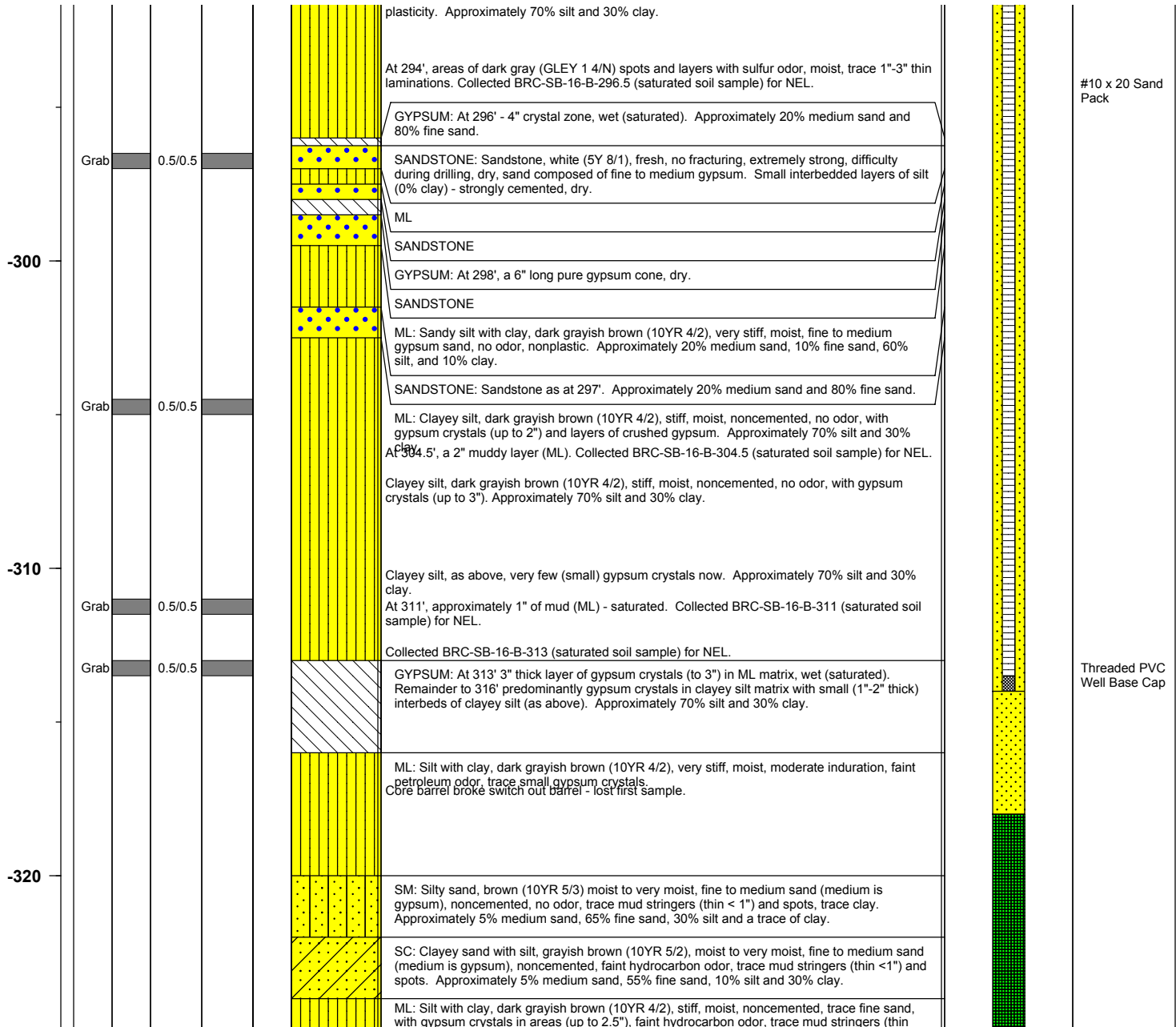
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							<1") and spots. Approximately 80% silt, 20% clay and a trace of fine sand.	
-330							SM: Silty sand, dark yellowish brown (10YR 4/4), moist to very moist in spots, fine to medium sand (composed of silt chips), weak induration, no odor, trace mud stringers (as above). Approximately 15% medium sand, 45% fine sand, 40% silt and a trace of clay.	
							ML: Clayey silt with sand, brown (7.5YR 4/2), very stiff, moist, fine to medium sand (medium is gypsum), noncemented, faint hydrocarbon odor, low plasticity. Approximately 10% fine sand, 60% silt, 30% clay and a trace of medium sand.	
	Grab	0.5/0.5					Clayey silt with sand, brown (7.5YR 4/2), stiff, moist to very moist, fine to medium sand (medium is gypsum), noncemented, no odor, medium plasticity with gypsum crystals. Approximately 10% fine sand, 60% silt, 30% clay and a trace of medium sand.	
							At 336', wet zone of crystal rich ML. Collected BRC-SB-16-B-336 (saturated soil sample) for NEL.	
-340							SC: At 337.5', clayey sand with silt, brown (7.5YR 5/2), moist to very moist in areas, fine to medium sand, noncemented, no odor. Approximately 10% coarse sand, 60% fine sand, 10% silt, and 20% clay.	
	Grab	0.5/0.5					At 337', clayey silt with sand (as above), with local spots/inclusions of fine sand (SP) -100% fine, moist only. Note of 337'-347' core, driller forgot location of one 2.5' core, numbers may be off up to 1.5'.	
							Collected BRC-SB-16-B-342 (saturated soil sample) for NEL.	
							SP: Poorly graded sand, grayish brown (10YR 5/2), wet, fine sand, trace silt, noncemented, no odor. Approximately 100% fine sand with a trace of silt.	
							At 343.5'-344', SP as at 342, wet. Approximately 100% fine sand and a trace of silt.	
							SC: Clayey sand, brown (7.5YR 5/3), moist to very moist in areas, fine to medium sand (medium is silt chips), non-to-weak induration, no odor. Approximately 15% medium sand, 50% fine sand, 35% clay with a trace of silt.	
							ML: Clayey silt with sand, dark grayish brown (10YR 4/2), stiff, moist, noncemented, no odor, high plasticity, with gypsum crystals (up to 2"). Approximately 5% medium sand, 10% fine sand, 50% silt and 35% clay.	
-350							SC: At 348.5', clayey sand, as at 345', very moist to wet. Approximately 15% medium sand, 50% fine sand, 35% clay and a trace of silt.	
							At 352', small stringers of SP, as at 342' (1"-3"). Approximately 100% of fine sand with a trace of silt.	

Cement  
Backfill

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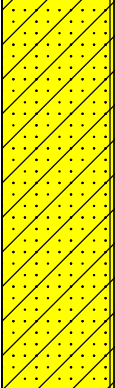
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-360								 Cement Backfill
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