

SOIL BORING LOG

CAMP STANLEY STORAGE ACTIVITY

BORING LOCATION: BURN AREA 19 (B-19)	BORING NUMBER: B19-SB1
SITE: CAMP STANLEY STORAGE ACTIVITY	CONTRACTOR: PARSONS ENGINEERING SCIENCE
PROJECT: WELL 18 SOURCE CHARACTERIZATION	DRILLING CONTRACTOR: JEDI
LOGGED BY: D. WHITE	REF. LOGBOOK: 1
BORING DEPTH (ft-BGL): 30	DRILLER: T. STARIN
BORING ELEVATION (ft-MSL):	DRILLING RIG: MOBIL B-56
EAST COORDINATE:	DRILLING METHOD: SPLIT-SPOON/AIR CORE
NORTH COORDINATE:	SAMPLING METHOD: SPLIT-SPOON/CORE BARREL
BEGIN DRILLING: 23-FEB-95	END DRILLING: 24-FEB-95

DEPTH (feet)	SAMPLE RECOVERY	ANALYTICAL SAMPLE	HEAD SPACE (ppm)	LITHOLOGIC DESCRIPTION	GRAPHIC LOG	COMMENTS
0				LIMESTONE, white (10YR 8/2), massive. Vuggy, broken, clay lenses present (<3 mm thick), hard, dry.		
5			0	LIMESTONE, white (10YR 8/2), vuggy, hard, platy in core barrel.		
10			0	Gray (7.5YR N6), fossils, massive, moist.		
15			0	LIMESTONE, gray (7.5YR N6), less massive with depth, alternating hard and soft seams (soft seams friable), increase in forams, pelecypods from 13 to 15.4, gastropods present, dry.		
20			0	LIMESTONE, white (10YR 8/2), alternating hard and soft seams, increase in forams, massive, vugs throughout, less cemented towards 19.5 ft., damp.		
25			0	LIMESTONE, white (10YR 8/2), very vuggy, channels through core, massive where no voids, massive, moist to touch on outside. Very pale brown (10YR 7/4).		
25.4			0	Gray (7.5YR N6).		
28			0	LIMESTONE, (7.5YR N6), massive, hard, few voids, not layered or fractured, few clay seams from 25.4 to 28', damp.		
30			0	TOTAL DEPTH = 30 FT.		

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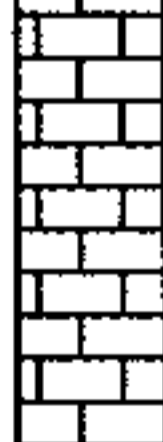

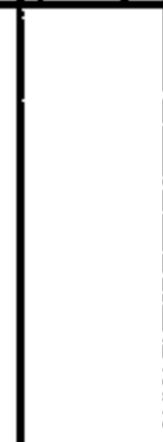
BORING LOCATION: BURN AREA 19 (B-19)	BORING NUMBER: B19-SB2
SITE: CAMP STANLEY STORAGE ACTIVITY	CONTRACTOR: PARSONS ENGINEERING SCIENCE
PROJECT: WELL 16 SOURCE CHARACTERIZATION	DRILLING CONTRACTOR: JEDI
LOGGED BY: D. WHITE	REF. LOGBOOK: 1
BORING DEPTH (ft-BGL): 30	DRILLER: T. STARIN
BORING ELEVATION (ft-MSL):	DRILLING RIG: MOBIL B-58
EAST COORDINATE:	DRILLING METHOD: SPLIT-SPOON/AIR CORE
NORTH COORDINATE:	SAMPLING METHOD: SPLIT-SPOON/CORE BARREL
BEGIN DRILLING: 24-FEB-95	END DRILLING: 24-FEB-95

DEPTH (feet)	SAMPLE RECOVERY	ANALYTICAL SAMPLE	HEAD SPACE (DOM)	LITHOLOGIC DESCRIPTION	USCS GRAPHIC LOG	COMMENTS
0	X	X		Sample refused.	CL	
5	X		0	<p>Marly CLAY, light yellow brown (10YR 6/4), or clayey marl, weathered, slightly friable (marl), very stiff, medium plasticity, damp to moist.</p> <p>LIMESTONE, white (10YR 8/2), massive, easily broken to 8.5 ft., very hard and vuggy, layered from 8.5-9.5 ft., few clayey seams, fossils toward bottom, dry.</p>		
10	X		0	<p>LIMESTONE, white (10YR 8/2), friable but hard, not as massive as above, forams, gastropods and pelecypods throughout, dry.</p> <p>Gray (7.5YR N6).</p>		
15	X	X	0	<p>LIMESTONE, gray (7.5YR N6), massive, very hard from 17-18 ft., very vuggy, layered, moist, wet spots towards 19 ft.</p> <p>White (10YR 8/2).</p>		
20	X		0	<p>LIMESTONE, white (10YR 8/1), layered vugs & massive vugs at 21-22' and 23-23.5', vugs at 23-23.5 appear to be dissolution of and around around fossils, damp to moist.</p> <p>Changes gradually to gray (10YR 7/3).</p> <p>Light gray (7.5YR N6).</p>		
25	X		0	<p>Massive LIMESTONE, light gray (10YR 7/1).</p>		
30	X	X	0	TOTAL DEPTH = 30 FT.		
35						

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CAMP STANLEY STORAGE ACTIVITY

BORING LOCATION: BURN AREA 19 (B-19)	BORING NUMBER: B19-SB3
SITE: CAMP STANLEY STORAGE ACTIVITY	CONTRACTOR: PARSONS ENGINEERING SCIENCE
PROJECT: WELL 18 SOURCE CHARACTERIZATION	DRILLING CONTRACTOR: JEDI
LOGGED BY: M. TOWN	REF. LOGBOOK: 1
BORING DEPTH (ft-BGL): 30	DRILLER: T. STARIN
BORING ELEVATION (ft-MSL):	DRILLING RIG: MOBIL B-58
EAST COORDINATE:	DRILLING METHOD: SPLIT-SPOON/AIR CORE
NORTH COORDINATE:	SAMPLING METHOD: SPLIT-SPOON/CORE BARREL
BEGIN DRILLING: 27-FEB-95	END DRILLING: 27-FEB-95

DEPTH (feet)	SAMPLE RECOVERY	ANALYTICAL SAMPLE	HEAD SPACE (ft)	LITHOLOGIC DESCRIPTION	SSCSU	GRAPHIC LOG	COMMENTS
0				CLAY with gravel-sized limestone fragments and silt, brownish yellow (10YR 8/6), soft, medium plasticity, damp.			Clay formed boot blocking recovery.
5				Marly LIMESTONE, pale yellow (2.5Y 7/4), highly weathered, vugs at approx. 5.5 ft., soft to moderately stiff, medium plasticity, damp.			
7				LIMESTONE, yellow (2.5Y 8/6), massive, vugs 7 to 7.8 ft., fossils, some clay between layers, damp.			
10				LIMESTONE, yellow (2.5Y 8/6), fossiliferous (forams and pelecypods), friable, dry. Light gray (10YR 7/1).			
15				LIMESTONE, yellow (2.5Y 8/6), highly weathered, vuggy, forams, pelecypods, dry. Very pale brown (10YR 8/3).			
20				Massive, some iron (orange) staining.			
21				LIMESTONE, light gray to gray (10YR 8/1), coarse-grained, vuggy at 21-22 ft. and 23-23.5 ft., wet in vuggy areas, vugs appear to be dissolution of or around fossil fragments, damp to wet.			
26.5				LIMESTONE, yellow (2.5Y 8/6), massive, bloturbation from 26.5 to 27 ft., dry.			
30				Coarse-grained. TOTAL DEPTH = 30 FT.			

SOIL BORING LOG

CAMP STANLEY STORAGE ACTIVITY

SITE LOCATION: B19	BORING NUMBER: B19-SB4
CLIENT: CAMP STANLEY STORAGE ACTIVITY	CONTRACTOR: PARSONS ENGINEERING SCIENCE, INC.
PROJECT: SWMU CLOSURE	DRILLING CONTRACTOR: CORE TERRA, INC.
LOGGED BY: K. TISCHLER	REF. LOGBOOK: 735903
BORING DEPTH (ft-BGL): 34.9	DRILLER: ROBERT HUBLER
BORING ELEVATION (ft-MSL): NA	DRILLING RIG: MOBILE B-81 HDX
EAST COORDINATE: 537333	DRILLING METHOD: HOLLOW STEM AUGER/AIR ROTARY
NORTH COORDINATE: 3288440	SAMPLING METHOD: 5' CORE BARREL/SPLIT SPOON
BEGIN DRILLING: 08/30/98 (1050)	END DRILLING: 09/03/98 (1030)

DEPTH (feet)	SAMPLE RECOVERY	ANALYTICAL SAMPLE	PTD (ppm)	LITHOLOGIC DESCRIPTION	GRAPHIC LOG	COMMENTS
1.8/2	0		0	SILTY CLAY, plastic to slightly plastic.		
2				Very weathered LIMESTONE/CALICHE, very pale brown (10YR 8/3), friable, breaks like soft chalk, moderately firm, slightly plastic, moist at .5-2', then dry.		Hollow-stem auger and split-spoon sampling to 6.5'.
1.4/2	0		0			
4						
1.7/2	0		0	Weathered LIMESTONE, mottled gray & tan (10YR 6/6), firm to hard, fractured limestone with plastic clay component interbedded, moist.		
6						
0.9/1	0		0	LIMESTONE (mudstone/wackestone), light yellowish brown (10YR 8/4), hard, massive, pelecypods (< 1.5"), no vugs or obvious dissolution features, dry.		
8						
0.8/1	0		0	MARL/SILT, interbedded with limestone, plastic, dry to slightly moist.		
10				MARL/SILT, as above.		Limestone breaks fairly easily with hammer.
0.6/4	0		0	LIMESTONE, as at 6.5-8.0'.		
12						
				LIMESTONE (wackestone), gradual color change to gray (10YR 6/1), hard, massive, numerous foraminiferas (chinaman hats), dry.		
14				LIMESTONE, gray as above, slightly larger, more evident forams.		
2.5/5	0		0			
16						
				LIMESTONE (wackestone), color change to tan, massive, foraminiferas, occasional bivalves, Fe oxide staining.		
18				MARLY LIMESTONE, yellow (10YR 7/6), hard to firm, slightly plastic, foraminifera (marly wackestone), Fe oxide staining, moist.		Plastic with fingernail, breaks when hammered.
3.9/5	0		0			
20						

* Analytical samples were taken in March 2000 due to problems associated with ITS Laboratory.

SOIL BORING LOG

CAMP STANLEY STORAGE ACTIVITY

SITE LOCATION: B19	BORING NUMBER: B19-SB4
CLIENT: CAMP STANLEY STORAGE ACTIVITY	CONTRACTOR: PARSONS ENGINEERING SCIENCE, INC.
PROJECT: SWMU CLOSURE	DRILLING CONTRACTOR: CORE TERRA, INC.
LOGGED BY: K. TISCHLER	REF. LOGBOOK: 735903
BORING DEPTH (ft-BGL): 34.9	DRILLER: ROBERT HUBLER
BORING ELEVATION (ft-MSL): NA	DRILLING RIG: MOBILE B-81 HDX
EAST COORDINATE: 537333	DRILLING METHOD: HOLLOW STEM AUGER/AIR ROTARY
NORTH COORDINATE: 3286440	SAMPLING METHOD: 5' CORE BARREL/SPLIT SPOON
BEGIN DRILLING: 08/30/96 (1050)	END DRILLING: 09/03/96 (1030)







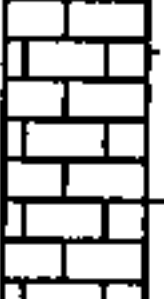




DEPTH (feet)	SAMPLE RECOVERY	ANALYTICAL SAMPLE	P10 (ppm)	LITHOLOGIC DESCRIPTION	SCS GRAPHIC LOG	COMMENTS
3.9/5			0	LIMESTONE (packstone), very pale brown (10YR 7/4), hard, numerous small (< 1/16") forams - pock marked appearance, Fe oxide staining, slightly moist.		
22				LIMESTONE, as above, 1-inch vugs, fracture* - no signs of displacement, 1 ft. long length-wise down core-split piece in half limestone is moist.		*Explains loss of circulation, porous - vugs above fracture.
24	4.3/5		0	Transition to gray LIMESTONE as seen at 11.5-12'.		
28				LIMESTONE (wackestone), light gray (10YR 7/2), hard, small forams common (< 1/16"), no evidence of secondary solution enhancement, small dark mineral - possible detrital amphibole, dry.		Drilling suspended due to approaching thunderstorms.
30	/5		0			
32						
34	/2.9		0			
36				Total depth = 34.9 feet.		
38						
40						

* Analytical samples were taken in March 2000 due to problems associated with ITS Laboratory.

SOIL BORING LOG

CAMP STANLEY STORAGE ACTIVITY

SITE LOCATION: B19	BORING NUMBER: B19-SB5
CLIENT: CAMP STANLEY STORAGE ACTIVITY	CONTRACTOR: PARSONS ENGINEERING SCIENCE, INC.
PROJECT: SWMU CLOSURE	DRILLING CONTRACTOR: CORE TERRA, INC.
LOGGED BY: K. TISCHLER	REF. LOGBOOK: 735903
BORING DEPTH (ft-BGL): 34.2	DRILLER: ROBERT HUBLER
BORING ELEVATION (ft-MSL): NA	DRILLING RIG: MOBILE B-61 HDX
EAST COORDINATE: 537324	DRILLING METHOD: HOLLOW STEM AUGER/AIR ROTARY
NORTH COORDINATE: 3286450	SAMPLING METHOD: 5' CORE BARREL/SPLIT SPOON
BEGIN DRILLING: 09/02/96 (1050)	END DRILLING: 09/02/96 (1600)

DEPTH (feet)	SAMPLE RECOVERY	ANALYTICAL SAMPLE	PTD (ppm)	LITHOLOGIC DESCRIPTION	SUSC	GRAPHIC LOG	COMMENTS
0	1.2/2		0	SILT, with small clay component, friable, loose, dry. CALICHE, weathered LIMESTONE, white, very pale brown (10YR 7/4), slightly plastic then breaks.			Hollow-stem auger and split-spoon sampling to 6'.
2	1.2/2						
4	1.2/2		8				
6	2/2		0	MARL, yellowish brown (10YR 5/4), slightly plastic, brittle, mottled appearance, occasional bivalve shells (1/16" to 1/4"), dendritic Fe oxide stains, also planes of Fe staining (dark).			Driller reports rock at 6', core block at 8'.
8				Same as above, grades into LIMESTONE.			Air core 6-34.2'.
10	4.6/5		0	LIMESTONE (wackestone), pink (5YR 8/3), hard, breaks easily w/hammer, pelecypods & bivalves (1/2" and smaller), turritella mold, occasional Fe oxide staining, dry.			
12				LIMESTONE (wackestone), gray (10YR 5/1), hard, numerous small forams (< 1/8"), gastropods/bivalves, dry.			
14			0				
16				LIMESTONE (wackestone), very pale brown (10YR 8/2), dry, medium to large forams common (> 1/8"), gastropods (< 1/4"), dry.			
18	4.5/5		0	LIMESTONE (wackestone/packstone), light gray (10YR 7/2), very hard, forams & bivalves common, small allochems are difficult to distinguish, dry to slightly moist.			
20							

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SOIL BORING LOG

CAMP STANLEY STORAGE ACTIVITY

SITE LOCATION: B19	BORING NUMBER: B19-SB5
CLIENT: CAMP STANLEY STORAGE ACTIVITY	CONTRACTOR: PARSONS ENGINEERING SCIENCE, INC.
PROJECT: SWMU CLOSURE	DRILLING CONTRACTOR: CORE TERRA, INC.
LOGGED BY: K. TISCHLER	REF. LOGBOOK: 735903
BORING DEPTH (ft-BGL): 34.2	DRILLER: ROBERT HUBLER
BORING ELEVATION (ft-MSL): NA	DRILLING RIG: MOBILE B-81 HDX
EAST COORDINATE: 537324	DRILLING METHOD: HOLLOW STEM AUGER/AIR ROTARY
NORTH COORDINATE: 3286450	SAMPLING METHOD: 5' CORE BARREL/SPLIT SPOON
BEGIN DRILLING: 09/02/96 (1050)	END DRILLING: 09/02/96 (1800)

DEPTH (feet)	SAMPLE RECOVERY	ANALYTICAL SAMPLE	PID (ppm)	LITHOLOGIC DESCRIPTION	USCS GRAPHIC LOG	COMMENTS
22	4.5/5		0			
24				LIMESTONE, similar to above, very pale brown (10YR 7/4), hard, massive to compact, microcrystalline vuggy, vugs up to 1", low density of vugs per area but pronounced, dry.		Driller reports difficult circulation at 26'.
26	4.9/5		0	MARL, color change to light gray (10YR 7/1), at 26' areas/zones of microporosity (< 1/16"), similar to above.		
28						
30	5/5		0	LIMESTONE, gray (10YR 5/1), hard, numerous small forams visible in some sections, approx. 3' core displays infill of darker gray material, dry to moist.		
32						
34	1/1.2		0			
36				Total depth = 34.2 feet.		
38						
40						

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SOIL BORING LOG

CAMP STANLEY STORAGE ACTIVITY

SITE LOCATION: B19	BORING NUMBER: B19-SB6
CLIENT: CAMP STANLEY STORAGE ACTIVITY	CONTRACTOR: PARSONS ENGINEERING SCIENCE, INC.
PROJECT: SHMU CLOSURE	DRILLING CONTRACTOR: CORE TERRA, INC.
LOGGED BY: K. TISCHLER	REF. LOGBOOK: 735903
BORING DEPTH (ft-BGL): 35.8	DRILLER: ROBERT HUBLER
BORING ELEVATION (ft-MSL): NA	DRILLING RIG: MOBILE B-61 HDX
EAST COORDINATE:	DRILLING METHOD: AIR ROTARY
NORTH COORDINATE:	SAMPLING METHOD: 5' CORE BARREL/SPLIT SPOON
BEGIN DRILLING: 09/03/98 (1840)	END DRILLING: 09/04/98 (1110)

DEPTH (feet)	SAMPLE RECOVERY	ANALYTICAL SAMPLE	PTD (feet)	LITHOLOGIC DESCRIPTION	GRAPHIC LOG	COMMENTS
0 - 1.4/2		X	0	SILT/CLAY, very pale brown (10YR 7/4), friable, loose, grades into caliche, caliche slightly plastic, breaks/crumbles, slightly damp.		Hollow-stem auger and split-spoon sampling to 6'.
1.4/2 - 2						
2 - 4	1.3/2			Same as above, hard limestone, small layer.		
4 - 5.6/1						
5.6/1 - 6	0.6/1					
6 - 8			0	CLAY/LIMESTONE (wackestone/packstone), light yellowish brown (10YR 6/4), foraminifera, bivalves, black Fe oxide staining, moist.		Air core 6-35.8'. Core block.
8 - 10	0/2			MARL, tan. LIMESTONE (packstone), very pale brown (10YR 8/2), forams, bivalves, light gray along fractures.		
10 - 14	4.8/5		0	Transition to gray LIMESTONE (10YR 8/2), hard, dry.		
14 - 16						
16 - 18	4.8/5		0	LIMESTONE (wackestone/packstone), gray to tan (10YR 4/1), hard, forams, porocystis globulara, dry to slightly moist.		
18 - 18.5				LIMESTONE (wackestone), light yellowish brown (10YR 6/4), forams, echinoid shell, bivalves (<1/2").		
18.5 - 19				Same as above, occasional vugs.		Rain overnight outside of core wet throughout length.
19 - 20	5/5	X	0			

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SOIL BORING LOG

CAMP STANLEY STORAGE ACTIVITY

SITE LOCATION: B19	BORING NUMBER: B19-SB8
CLIENT: CAMP STANLEY STORAGE ACTIVITY	CONTRACTOR: PARSONS ENGINEERING SCIENCE, INC.
PROJECT: SWMU CLOSURE	DRILLING CONTRACTOR: CORE TERRA, INC.
LOGGED BY: K. TISCHLER	REF. LOGBOOK: 735903
BORING DEPTH (ft-BGL): 35.8	DRILLER: ROBERT HUBLER
BORING ELEVATION (ft-MSL): NA	DRILLING RIG: MOBILE B-81 HDX
EAST COORDINATE:	DRILLING METHOD: AIR ROTARY
NORTH COORDINATE:	SAMPLING METHOD: 5' CORE BARREL/SPLIT SPOON
BEGIN DRILLING: 09/03/96 (1840)	END DRILLING: 09/04/96 (1110)

DEPTH (feet)	SAMPLE RECOVERY	ANALYTICAL SAMPLE	PTD (feet)	LITHOLOGIC DESCRIPTION	GRAPHIC LOG	COMMENTS
22	5/5		0			
24				Same as above, some gray banding, slightly damp.		
26	5/5		0	LIMESTONE (mudstone), compact limestone, grayish brown (10YR 5/2), hard, microcrystalline gray horizontal banding solution features, darker gray zones of microporosity, dry, 1' above base transitions into light gray (10YR 7/1) wackestone with forams & bivalves (< 1/4"), massive, hard, dry.		
28				Same as above, some sparry calcite replacement.		
30	5/5		0			
32						
34	2.8		0			
36				Total depth = 35.8 feet.		
38						
40						

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