

DESCRIPTIONS AND LAB DATA FOR FILL IN SELECTED PLAYA BASINS

This appendix provides stratigraphic descriptions and laboratory data for fill in four playa basins. The sites were chosen to provide a range in basin size and basin-fill lithologies. Miami playa is the smallest, followed by Gentry, Cone, and San Jon (Table 2). Additional data and discussion are available for Miami (Holliday et al., 1994) and San Jon (Hill et al., 1995), as well as Lupton East (Holliday, 1995b), Ryan (Hartwell, 1995), and Seminole-Rose (Holliday, 1995b). Analytical methods for determining sand-silt-clay content, carbonate content, and organic-carbon content follow Singer and Jantizky (1986).

The descriptions and laboratory data for Miami and San Jon correspond to the sections illustrated in Figure 3. The Miami section is core 90-10 of Holliday et al. (1994) and the San Jon section is Area II of Hill et al. (1995). The data for Gentry are from the south and west walls shown in Figure 2A and from the south end of the peninsula (i.e., the basin center) shown in plan view in Figure 2A and in the photo in Figure 2B. Lab data are not available for the West wall of the Gentry section. The section for the Cone playa was taken from a trench ~600 m southeast of the center of the basin or about half way between the basin center and the lunette that rims the east and southeast side of the basin margin. The subdivisions of facies presented in the tables of lab data (A2-D2) reflect field sampling on the basis of soil horization.

Notes on stratigraphic descriptions: Colors (Munsell notation) are given dry and moist (m).

Note on laboratory data: For <2 mm fraction -- VCOS = very coarse sand; COS = coarse sand; MS = medium sand; FS = fine sand; VFS = very fine sand

Table A1. Stratigraphic description of Miami playa.

Mud

0-31cm removed by excavations.

31-38cm; silt loam; gray (10YR 6/1 4/1m); angular blocky structure; mammoth with Clovis artifacts at base of unit; abrupt lower boundary.

Loess

38-48cm; silt; light brownish gray (10YR 6/2 4/2m); abrupt lower boundary.

Lower Mud

48-162cm; silt loam; dark gray to gray (10YR 4/1 5/1, 3/1m); angular blocky structure; Bt horizon; clear lower boundary.

Blackwater Draw Fm

162-360cm+, silt loam; dark grayish brown to light brownish gray (10YR 4/2 3/2m, 6/2 4/2m); prismatic to subangular blocky structure; Bt horizon stained by organic matter; Mn patches common.

Table A2. Laboratory data for the Miami playa.

Facies	Depth (cm)	% of < 2 mm Fraction								% CaCO ₃	% Org. Carbon
		VCOS	COS	MS	FS	VFS	Sand	Silt	Clay		
Mud	31-38	0	0	1	2	5	8	74	19	5	0.8
Eolian silt	38-48	0	0	0	0	0	1	94	6	2	0.5
Mud	48-92	0	1	2	4	1	7	77	15	2	0.7
	92-122	0	1	3	4	6	14	69	17	1	1.0
	122-142	0	1	2	3	1	6	77	17	0	0.8
	142-162	0	0	1	3	6	10	73	17	0	0.9
BwDrFm	162-182	0	0	0	2	1	4	77	19	0	0.6

Table B1. Stratigraphic description of Gentry playa.

Peninsula

Mud

0-309cm; loam to silt loam; grayish brown (10YR 5/2, 4/2m 3/1m); prismatic to angular blocky structure; slickensides common 169-279cm; A/C soil profile 0-279; grayish brown (2.5Y 5/2m) 279-309cm; strong brown (7.5YR 5/6 4/6m) sandy-loam dry-weather crack fillings 2-3cm wide common 0-279cm; clear lower boundary.

Eolian Sand

309-328cm; sandy loam; light olive gray (5Y 6/2 6/3m); massive with bedding locally preserved; abrupt lower boundary.

Mud

328-378cm; loam; pale yellow (5Y 7/3 6/2m); prismatic to platy structure; dendritic Mn coatings common; abrupt lower boundary.

Eolian Sand

378-380cm; sandy loam; pale yellow (5Y 7/3 6/3m); massive with bedding locally preserved; abrupt lower boundary.

Blackwater Draw Fm

380-434cm+; sandy clay loam; pale yellow to olive (5Y 7/3 5/6, 6/3m 4/6m); prismatic to blocky structure; Btg soil horizon; gleying concentrated along ped faces; Mn patches and concretions common.

Note: 309-380cm represents interbedding and some mixing of mud and eolian sand.

South Wall

Mud

0-56cm; loam; dark gray (10YR 4/1, 3/1m); prismatic to angular blocky structure; A/C soil profile; clear lower boundary.

Eolian Loam

56-109cm; sandy loam; brown (7.5YR 5/4, 4/4m); subangular blocky structure; A-Bw soil profile; clear lower boundary.

Mud

109-235cm; silt loam; gray (10YR 5/1, 4/1m); angular blocky structure; slickensides and Mn patches common on ped faces; clear lower boundary.

235-256cm; sandy loam; light gray (2.5Y 7/2, 5Y 7/2m); angular blocky structure; slickensides and Mn patches (7.5YR 2/0) common on ped faces; clear lower boundary.

Eolian Sand

256-291cm; sandy loam; light gray (10YR 7/1 7/2m) in upper half to very pale brown (10YR 7/3 6/3m) in lower half; massive, loose; Fe staining (5YR 4/4, 2.5YR 3/6m) and discontinuous, subhorizontal bands of Fe and Mn (7.5YR 2/0) in lower half; abrupt lower boundary.

Mud

291-338cm; loam to silt loam; light gray (2.5Y 7/2 6/2m) with very common, prominent mottles of light reddish brown (5YR 6/4 5/4m); angular blocky structure; Mn patches (7/5 YR 2.0) very common on ped faces; clear lower boundary.

338-429cm; sandy loam; light gray (10YR 7/2 6/2m) with some mottles of reddish brown (5YR 4/4, 2.5YR 3/4m); angular blocky structure; Mn patches (7/5 YR 2.0) very common on ped faces; clear lower boundary.

Eolian Sand

429-462cm; sand; light gray (10YR 7/1 7/2m); massive, loose; abrupt lower boundary.

Blackwater Draw Fm

462-588cm+; sandy loam; pinkish gray (7.5YR 6/2) with mottles of strong brown (7.5YR 4/6, 5YR 3/4m); prismatic to subangular blocky structure; Btg-Btgk soil profile; Mn patches (7.5YR 2/0) common on ped faces.

Table B1. continued

West Wall

Blackwater Draw Fm

0-240cm; sandy clay loam; light brown (7.5YR 6/4 5/4m); prismatic to subangular blocky structure; A-Bt-Btk soil profile; clear lower boundary.

Mud

240-484cm; silt loam; light yellowish brown (10YR 6/4 5/2m) with mottles of light brownish gray (2.5Y 6/2 5/2m); fine blocky structure; Bgk soil horizon; Mn patches common on ped faces; clear lower boundary.

484-543cm; sandy loam; light brownish gray (2.5Y 6/2 5/2m) with mottles of light brown (7.5YR 6/4 5/4m); fine blocky structure; Bg soil horizon; Mn patches common on ped faces; clear lower boundary.

Eolian Sand

543-615cm; sandy loam; light gray (2.5Y 7/2 6/2m); massive, loose; abrupt lower boundary.

Mud

615-680cm; sandy clay loam; light gray (2.5Y 7/2 6/2m) with mottles of reddish yellow to reddish brown (7.5YR 6/8, 7/2 to 5YR 4/4); angular blocky structure; Mn patches (2.5YR 2/0) common on ped faces; clear lower boundary.

Eolian Sand

680-706cm; sandy loam; light gray (2.5Y 7/2 6/2m); massive, loose; abrupt lower boundary.

Blackwater Draw Fm

706-841cm+; sandy clay loam; mottled reddish brown (5YR 5/4 4/6m), light gray (2.5Y 7/2), and pale yellow (5Y 7/3); prismatic to subangular blocky structure; Btgk soil horizon; Mn patches (7.5YR 2/0) and concretions very common.

Table B2. Laboratory data for the Gentry playa.

Peninsula											
Facies	Depth (cm)	% of < 2 mm Fraction								% CaCO ₃	% Org. Carbon
		VCOS	COS	MS	FS	VFS	Sand	Silt	Clay		
Mud	0-17	0	0	2	8	22	32	45	23	1	0.3
	17-54	0	1	5	17	22	44	33	23	1	0.1
	54-94	0	1	2	8	18	29	48	23	1	0.4
	94-129	0	0	2	8	19	29	54	17	1	0.2
	129-169	0	0	1	6	24	32	54	14	1	0.2
	169-226	0	0	1	4	18	23	60	17	1	0.2
	226-279	0	0	1	3	19	23	62	15	1	0.2
	279-309	0	0	1	5	18	24	59	17	1	0.1
Eolian sand	309-328	0	1	13	29	23	66	18	16	1	0.0
Sandy mud	328-378	0	0	3	23	21	47	38	15	1	0.1
Eolian sand	378-380	0	0	9	26	27	63	22	15	1	0.0
BwDrFm	380-434+	0	0	9	22	24	55	20	25	1	0.1

South Wall											
Facies	Depth (cm)	% of < 2 mm Fraction								% CaCO ₃	% Org. Carbon
		VCOS	COS	MS	FS	VFS	Sand	Silt	Clay		
Mud	0-56	0	1	6	20	20	47	26	27	1	0.3
Eolian loam	56-109	0	0	4	24	34	62	22	17	1	0.1
Mud	109-235	0	0	1	8	26	35	51	14	1	0.0
	235-256	0	0	5	22	32	59	35	6	—	—
Eolian sand	256-291	0	0	13	38	26	77	16	8	—	—
Mud	291-338	0	0	2	12	24	38	40	22	—	—
	338-429	0	0	2	10	28	40	59	1	—	—
Eolian sand	429-462	0	0	18	44	28	89	7	4	—	—
BwDrFm	462-529	0	0	5	27	27	59	27	14	—	—

Table C1. Stratigraphic description of Cone playa.

Playa-lake Carbonate

0-100cm; silt loam to loam; white to gray (10YR 8/1 7/1 6/2, 7/2m 5/2m 3/2m); A-Bw soil profile; friable; abrupt lower boundary.

Pliocene Lake Carbonate

100-170cm+; sandy loam; white to light gray (2.5Y 8/2 7/2); fine angular-blocky structure.

Table C2. Laboratory data for the Cone playa.

Facies	Depth (cm)	% of < 2 mm Fraction								% CaCO ₃	% Org. Carbon
		VCOS	COS	MS	FS	VFS	Sand	Silt	Clay		
Playa-lake Carbonate	0-20	--	--	--	--	--	26	62	12	19	1.2
	20-40	--	--	--	--	--	21	64	15	34	0.7
	40-60	--	--	--	--	--	43	46	11	42	0.5
	60-80	--	--	--	--	--	34	52	14	44	0.6
	80-100	--	--	--	--	--	32	56	12	47	0.4
Pliocene Lake Carbondale	100-125	--	--	--	--	--	60	30	10	35	0.1

Table D1. Stratigraphic description of San Jon playa.

Eolian Loam

0-53cm; silt loam; dark brown to brown (7.5YR 4/2 5/2 3/2m 4/2m); prismatic to subangular blocky structure; A-Bt soil profile 8-53cm; 0-8cm is recent eolian sediment; clear lower boundary.

Mud

53-175cm; silt loam; grayish brown to brown (10YR 5/2 3/2m; 7.5YR 5/2 5/4 4/2m, 3/4m); prismatic to angular blocky structure; ABtk-Bt soil profile; clear lower boundary.

Eolian Loam

175-255cm; silt loam; brown (7.5YR 5/4 4/4m); prismatic to subangular blocky structure; Bt soil horizon; clear lower boundary.

Mud

255-300cm; silt loam; dark brown (7.5YR 4/2 3/2m); prismatic to subangular blocky structure; ABt soil horizon; clear lower boundary.

Eolian Loam

300-487cm; sandy loam; brown (7.5YR 5/4 3/4m); prismatic to subangular blocky structure; Bt soil horizon; Mn patches common; clear lower boundary.

Delta Deposits

487-565cm; gravelly loam 487-503cm, brown (7.5YR 5/4 3/4m); massive silt loam 503-525cm, brown (7.5YR 5/4 4/4m); interbedded silt loam and sandy loam, 503-565cm, brown (7.5YR 5/4 3/4m); laminae 1-10mm thick; abrupt lower boundary.

Mud

565-654cm; silt loam; dark brown (7.5YR 4/2 3/2m); prismatic to angular blocky structure; Bt horizon; bison bone bed with artifacts at top of unit; common Mn patches; clear lower boundary.

Eolian Loam

654-820cm; silt loam; light reddish brown to reddish brown to brown to pinkish gray (5YR 6/4 5/4; 7.5YR 5/4 6/2 4/2m); subangular blocky structure; few to common Mn patches; Bt horizon 654-400cm; clear lower boundary.

Mud

820-970cm; silt loam; brown (10YR 5/3 4/3m; 7.5YR 5/4 4/4m); prismatic to angular blocky structure; Btk horizon 820-860cm; Btg horizon 860-970cm; Mn patches very common in lower 90cm; clear lower boundary.

Eolian Sand

970-1070cm; well-sorted loose sand; very pale brown (10YR 7/3 5/3m).

Fe-Mn Concretion

1070-1080cm; purplish blue (5PB 3/1); sheet-like body of Fe and Mn oxides; very hard; variable thickness, locally missing; locally splits into several lenses intermixed with the sand.

Table D2. Laboratory data for the San Jon playa.

Facies	Depth (cm)	% of < 2 mm Fraction								% CaCO ₃	% Org. Carbon
		VCOS	COS	MS	FS	VFS	Sand	Silt	Clay		
Eolian loam	0-8	0	0	0	5	25	30	57	13	0	1.6
	8-20	0	0	1	3	23	27	63	10	0	1.0
	20-28	0	0	1	4	21	26	64	10	0	1.0
	28-53	--	--	--	--	--	--	--	--	--	--
Mud	53-84	0	0	0	3	21	25	61	14	0	0.3
	84-165	0	0	1	4	24	29	60	11	0	0.3
	165-175	0	0	0	4	22	26	60	13	0	0.5
Eolian loam	175-255	0	0	0	1	15	16	73	10	0	0.5
Mud	255-300	--	--	--	--	--	--	--	--	--	--
Eolian loam	300-400	--	--	--	--	--	--	--	--	--	--
	400-423	0	0	3	16	7	26	65	8	0	0.4
	423-487	0	0	0	3	29	32	57	10	0	0.3
Delta	487-503	3	14	12	6	8	43	36	20	3	1.1
	503-525	0	1	2	7	19	29	60	11	1	0.0
	525-535	0	0	1	8	29	37	56	7	0	0.3
	535-565	0	0	0	3	25	28	67	4	0	0.1
Mud	565-654	0	0	1	4	18	23	71	6	0	0.5
Eolian loam	654-725	0	0	1	2	22	25	68	8	0	0.3
	725-800	0	0	1	7	26	34	55	10	0	0.3
	800-820	0	0	1	4	24	29	67	4	0	0.5
Mud	820-860	0	1	1	5	25	32	58	10	0	0.3
	860-880	0	1	1	3	20	25	62	14	0	0.3
	880-970	0	0	1	3	18	23	64	13	0	0.5