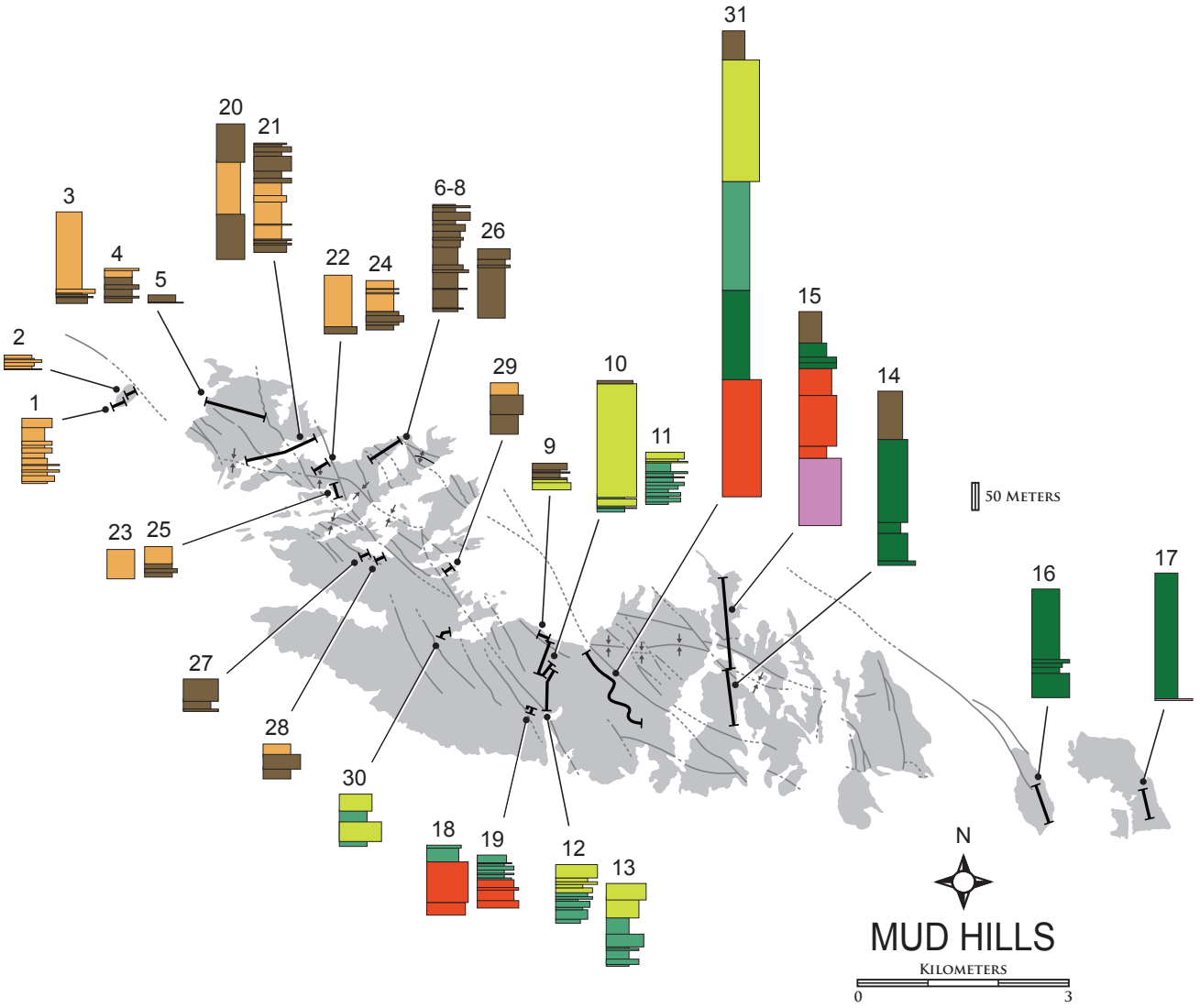
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FIG. S1.—Location of measured sections in the Mud Hills. Colors indicate facies association, as in Figure 5. Sections 20, 24, 25, 27 from Lindsay (1972); sections 21, 22, 23, 26, 28, 29, 30, 31 from Woodburne et al. (1990). See Table S1 for detailed locality information.

TABLE S1.—Location of measured sections used in this study, indicating approximate GPS coordinates of the beginning of each section. Coordinates are estimated for sections from Lindsay (1972), Woodburne et al. (1990), and MacFadden et al. (1990), based on locality information provided in those publications. Geographic names from Mud Hills 7.5-minute quadrangle (USGS 1996).

Section number (Fig. S1)	Reference	Section name in reference	Location	Approximate coordinates, beginning of section	Section thickness (m)
1	This paper	Truck Top Wash 1	Western Mud Hills	35.061°, -117.103°	31.5
2	This paper	Truck Top Wash 2	Western Mud Hills	35.060°, -117.103°	144
3	This paper	Falkenbach Wash 3	Western Mud Hills	35.058°, -117.087°	203
4	This paper	Falkenbach Wash 2	Western Mud Hills	35.058°, -117.085°	75.5
5	This paper	Falkenbach Wash 1	Western Mud Hills	35.058°, -117.084°	14
6	This paper	Hell Gate Basin 3	Upper Fossil Canyon	35.053°, -117.066°	78.8
7	This paper	Hell Gate Basin 2	Upper Fossil Canyon	35.053°, -117.068°	30
8	This paper	Hell Gate Basin 1	Upper Fossil Canyon	35.052°, -117.068°	135
9	This paper	Skyline	Upper Coon Canyon	35.034°, -117.052°	59
10	This paper	Cal Uranium Prospect Canyon 4	Central Mud Hills	35.029°, -117.051°	294.5
11	This paper	Cal Uranium Prospect Canyon 2	Central Mud Hills	35.028°, -117.049°	109
12	This paper	Cal Uranium Prospect Canyon 3	Central Mud Hills	35.027°, -117.048°	121.5
13	This paper	Cal Uranium Prospect Canyon 1	Central Mud Hills	35.025°, -117.048°	182
14	This paper	Owl Canyon 2	Owl Canyon	35.022°, -117.024°	384.5
15	This paper	Owl Canyon 1	Owl Canyon	35.039°, -117.025°	450
16	This paper	Copper City Road	Eastern Mud Hills	35.022°, -116.974°	244.5
17	This paper	Gypsum Basin	Eastern Mud Hills	35.021°, -116.955°	284
18	This paper	Rainy Day Canyon 1	Central Mud Hills	35.026°, -117.055°	60
19	This paper	Rainy Day Canyon 2	Central Mud Hills	35.025°, -117.052°	94
20	Lindsay (1972)	Section C, Carnivore Canyon	Western Mud Hills	35.055°, -117.082°	235
21	Woodburne et al. (1990); MacFadden et al. (1990)	Section 2, Carnivore Canyon, north limb	Western Mud Hills	35.055°, -177.075°	300
22	Woodburne et al. (1990); MacFadden et al. (1990)	Section 3a, Rodent Hill Basin, north limb	Fossil Canyon	35.051°, -117.075°	130
23	Woodburne et al. (1990); MacFadden et al. (1990)	Section 3b, Rodent Hill Basin, south limb	Fossil Canyon	35.046°, -117.076°	65
24	Lindsay (1972)	Section F, Rodent Hill Basin, north limb	Fossil Canyon	35.051°, -117.075°	104

TABLE S1.—Location of measured sections used in this study, indicating approximate GPS coordinates of the beginning of each section. Coordinates are estimated for sections from Lindsay (1972), Woodburne et al. (1990), and MacFadden et al. (1990), based on locality information provided in those publications. Geographic names from Mud Hills 7.5-minute quadrangle (USGS 1996).

25	Lindsay (1972)	Section G, Rodent Hill Basin, south limb	Fossil Canyon	35.047°, -117.077°	66
26	Woodburne et al. (1990); MacFadden et al. (1990)	Section 6, Hell Gate Basin, north limb	Upper Fossil Canyon	35.052°, -117.068°	186
27	Lindsay (1972)	Section I, Bird Canyon, south limb	Western Mud Hills	35.044°, -117.072°	75
28	Woodburne et al. (1990); MacFadden et al. (1990)	Section 5, Fuller's Earth Canyon, south limb	Western Mud Hills	35.042°, -117.069°	75
29	Woodburne et al. (1990); MacFadden et al. (1990)	Section 7, Hemicyon Basin, south limb	Central Mud Hills	35.039°, -117.060°	95
30	Woodburne et al. (1990); MacFadden et al. (1990)	Section 4, Steepside Quarry, south limb	Coon Canyon	35.032°, -117.060°	105
31	Woodburne et al. (1990); MacFadden et al. (1990)	Section 1, Rainbow Loop	Rainbow Basin	35.018°, -117.036°	840

TABLE S2.—Measured and decompacted thicknesses and age estimates used to calculate sediment-accumulation rates for each facies association.

FA	Section number (Fig. 5), source	Lower meter	Upper meter	Thickness (m)	Compaction factor	Decompacted thickness (m)	Lower Age (Ma)	Upper Age (Ma)	Duration (Ma)	Sediment-accumulation rate (m/Myr)
1	Section 31, Woodburne et al. (1990)	27	186	159	0.069618	170.0693	17.31	16.76	0.55	309.22
2	Section 31, Woodburne et al. (1990)	241	357	116	0.102463	127.8857	16.58	16.32	0.26	491.87
2	Section 31, Woodburne et al. (1990)	357	440	83	0.102463	91.50443	16.32	16.04	0.28	326.80
2	Section 31, Woodburne et al. (1990)	329	357	28	0.102463	30.86896	16.35	16.32	0.03	1028.97
2	Section 31, Woodburne et al. (1990)	241	308	67	0.102463	73.86502	16.58	16.52	0.06	1231.08
2	Section 31, Woodburne et al. (1990)	308	357	49	0.102463	54.02069	16.52	16.32	0.20	270.10
2	Section 31, Woodburne et al. (1990)	308	329	21	0.102463	23.15172	16.52	16.35	0.17	136.19
3	Section 31, Woodburne et al. (1990)	5	50	45	0.088693	48.99119	16.04	15.80	0.24	204.13
3	Section 31, Woodburne et al. (1990)	357	440	83	0.088693	90.36152	16.32	16.04	0.28	322.72
3	Section 31, Woodburne et al. (1990)	440	482	42	0.088693	45.72511	16.04	15.80	0.24	190.52
3	Section 31, Woodburne et al. (1990)	482	685	203	0.088693	221.0047	15.80	15.16	0.64	345.32
4	Section 10, Loughney and Badgley	12.48	287.5	275.02	0.069213	294.055	15.80	15.20	0.60	490.09
4	Section 10, Loughney and Badgley	274.5	287.5	13	0.069213	13.89977	15.04	14.89	0.15	92.67
4	Section 10, Loughney and Badgley	186.5	287.5	101	0.069213	107.9905	15.16	14.89	0.27	399.96
4	Not figured, Loughney and Badgley	69	224.6	155.6	0.069213	166.3695	15.80	15.20	0.60	277.28
4	Section 31, Woodburne et al. (1990)	773	786	13	0.069213	13.89977	15.16	14.89	0.27	51.48
4	Section 31, Woodburne et al. (1990)	685	786	101	0.069213	107.9905	15.16	14.89	0.27	399.96

TABLE S2.—Measured and decompacted thicknesses and age estimates used to calculate sediment-accumulation rates for each facies association.

4	Section 31, Woodburne et al. (1990)	685	773	88	0.069213	94.09074	15.16	15.04	0.12	784.09
5	Section 26, Woodburne et al. (1990)	15	30	15	0.097805	16.46708	15.20	14.80	0.40	41.17
5	Section 26, Woodburne et al. (1990)	30	50	20	0.097805	21.9561	14.80	14.61	0.19	115.56
5	Section 26, Woodburne et al. (1990)	50	76	26	0.097805	28.54293	14.61	14.00	0.61	46.56
5	Section 26, Woodburne et al. (1990)	76	92	16	0.097805	17.56488	14.00	13.70	0.30	58.55
5	Section 26, Woodburne et al. (1990)	76	130	54	0.097805	59.28147	14.00	13.40	0.60	98.80
5	Section 26, Woodburne et al. (1990)	92	120	28	0.097805	30.73854	13.70	13.50	0.20	153.69
5	Section 26, Woodburne et al. (1990)	120	130	10	0.097805	10.97805	13.50	13.40	0.10	109.78
5	Section 26, Woodburne et al. (1990)	15	50	35	0.097805	38.42318	14.89	14.61	0.28	137.23
5	Section 26, Woodburne et al. (1990)	15	50	35	0.097805	38.42318	15.20	14.61	0.59	65.12
5	Section 26, Woodburne et al. (1990)	15	30	15	0.097805	16.46708	14.89	14.80	0.09	182.97
5	Sections 6-8, Loughney and Badgley	78.8	158	79.2	0.097805	86.94616	15.20	14.00	1.20	72.46
5	Sections 6-8, Loughney and Badgley	158	240	82	0.097805	90.02001	14.00	13.40	0.60	150.03
5	Section 29, Woodburne et al. (1990)	17	58	41	0.097805	45.01001	14.00	13.70	0.30	150.03
5	Section 29, Woodburne et al. (1990)	17	90	73	0.097805	80.13977	14.00	13.40	0.60	133.57
5	Section 29, Woodburne et al. (1990)	58	80	22	0.097805	24.15171	13.70	13.50	0.20	120.76
5	Section 29, Woodburne et al. (1990)	80	90	10	0.097805	10.97805	13.50	13.40	0.10	109.78
5	Section 31, Woodburne et al. (1990)	786	807	21	0.097805	23.05391	15.20	14.80	0.40	57.63
5	Section 31, Woodburne	786	807	21	0.097805	23.05391	14.89	14.80	0.09	256.15

TABLE S2.—Measured and decompacted thicknesses and age estimates used to calculate sediment-accumulation rates for each facies association.

	et al. (1990)									
5	Section 31, Woodburne et al. (1990)	807	827	20	0.097805	21.9561	14.80	14.61	0.19	115.56
5	Section 31, Woodburne et al. (1990)	786	807	21	0.097805	23.05391	14.89	14.80	0.09	256.15
5	Section 14, Loughney and Badgley	279	310	31	0.097805	34.03196	15.20	14.80	0.40	85.08
6	Section 21, Woodburne et al. (1990)	25	83	58	0.093958	63.44956	15.50	15.04	0.46	137.93
6	Section 21, Woodburne et al. (1990)	105	190	85	0.093958	92.98643	15.20	14.00	1.20	77.49
6	Section 21, Woodburne et al. (1990)	105	140	35	0.093958	38.28853	15.20	14.61	0.59	64.90
6	Section 21, Woodburne et al. (1990)	140	190	50	0.093958	54.6979	14.61	14.00	0.61	89.67
6	Section 21, Woodburne et al. (1990)	83	140	57	0.093958	62.35561	15.04	14.61	0.43	145.01
6	Section 21, Woodburne et al. (1990)	83	120	37	0.093958	40.47645	15.04	14.80	0.24	168.65
6	Section 21, Woodburne et al. (1990)	83	105	22	0.093958	24.06708	15.04	14.89	0.15	160.45
6	Section 21, Woodburne et al. (1990)	83	275	192	0.093958	210.0399	15.04	13.70	1.34	156.75
6	Section 21, Woodburne et al. (1990)	140	275	135	0.093958	147.6843	14.61	13.70	0.91	162.29
6	Section 21, Woodburne et al. (1990)	25	275	250	0.093958	273.4895	15.50	13.70	1.80	151.94
6	Section 21, Woodburne et al. (1990)	25	140	115	0.093958	125.8052	15.50	14.61	0.89	141.35
6	Section 21, Woodburne et al. (1990)	25	300	275	0.093958	300.8385	15.50	13.50	2.00	150.42
6	Section 21, Woodburne et al. (1990)	25	190	165	0.093958	180.5031	15.50	14.00	1.50	120.34
6	Section 21, Woodburne et al. (1990)	25	105	80	0.093958	87.51664	15.50	15.20	0.30	291.72
6	Section 21, Woodburne et al. (1990)	190	275	85	0.093958	92.98643	14.00	13.70	0.30	309.95

TABLE S2.—Measured and decompacted thicknesses and age estimates used to calculate sediment-accumulation rates for each facies association.

6	Section 21, Woodburne et al. (1990)	275	300	25	0.093958	27.34895	13.70	13.50	0.20	136.74
6	Not figured, Steinen (1966)	64	131.7	67.7	0.093958	74.02814	15.20	14.00	1.20	61.70

SEDIMENT-ACCUMULATION RATES

Sediment-accumulation rates for each facies association were calculated from uncompacted thicknesses. Compaction for terrestrial sediments was estimated from Equation (4) of Sheldon and Tabor (2009):

$$C = \frac{-S_i}{\frac{F_0}{e^{kD}-1}},$$

where S_i is solidity of the sediment, F_0 is the initial porosity of the sediment, k is a constant, and D is burial depth (km). F_0 was obtained from average porosity measurements of floodplain lithologies from Nadon and Issler (1997).

Burial depth for the Barstow Formation was estimated from Sheppard and Gude (1969) and Glazner (1988). No definitive burial estimates for the Barstow Formation exist in the literature. Glazner (1988) studied metasomatism of volcanic rocks from the Cady Mountains, California, approximately 75 km east of the Mud Hills. Sheppard and Gude (1969) and Glazner (1988) estimate that units older than the Peach Springs Tuff (a regional marker bed dated at 18.5 Mya) were subjected to relatively shallow (1-2 km), low-temperature (< 150°C) metasomatism. Sheppard and Gude (1969) studied diagenesis of tuffs in the Barstow Formation in the Mud Hills. While they did not provide direct burial estimates, they concluded that the Barstow Formation was not deeply buried, based on the alteration phases of zeolites and clays. We therefore considered the burial depth to be between 1-2 km. We used the average of compaction estimates for depths of 1-2 km to compute the uncompacted thickness of dated sections.

We used the revised paleomagnetic correlations of Woodburne (1996) with updated chron ages from Ogg (2013) for the duration of paleomagnetic intervals.

Table S1 lists the measured thickness, uncompacted thickness estimate, interval duration, and estimated sediment-accumulation rate for dated stratigraphic intervals of the Barstow Formation in the Mud Hills.

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