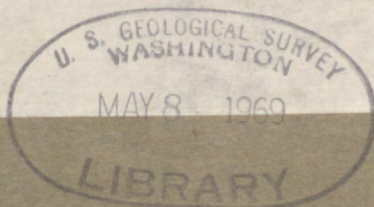


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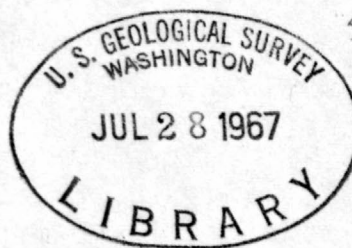
*US* GEOLOGICAL SURVEY

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Tabulated petrologic data from a study of  
the Morrison Formation in the  
Colorado Plateau region

By

Robert A. Cadigan



OPEN FILE REPORT

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1967

Prepared on behalf of the  
U.S. Atomic Energy Commission

These basic analytical data are summarized in  
U.S. Geological Survey Professional Paper 556,  
by Robert A. Cadigan, 1967.



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Table 1.--Statistical measures of the phi grain-size distributions of 267 sandstone samples from the Salt Wash Member of the Morrison Formation

[Map location refers to sample locality number on plate 1 of Professional Paper 556. Data were obtained by mechanical grain-size analysis. St. dev., standard deviation; Skew., skewness; Kurt., kurtosis; percentiles in phi terms are shown as  $\phi_2$  (second percentile),  $\phi_5$  (fifth percentile), etc. Asterisk (\*) indicates thin-section modal analysis of sample is given in Professional Paper, table 12. Values in parentheses are location averages (means)]

Map location	Sample No.	Mode (mm)	Median (mm)	Mean (mm)	St. dev. (mm)	Skew.	Kurt.	$\phi_2$	$\phi_5$	$\phi_{16}$	$\phi_{50}$	$\phi_{84}$	$\phi_{95}$	$\phi_{98}$
		(phi notation)												
2	*L-657	0.210	0.182	2.768	1.286	1.512	11.847	1.40	1.60	1.99	2.45	3.25	5.00	8.00
	658	.125	.121	3.602	1.764	1.312	6.719	2.39	2.55	2.80	3.05	3.95	8.00	10.50
	659	.210	.219	2.692	1.651	1.721	12.877	1.55	1.73	1.93	2.19	2.85	5.50	10.25
		(0.182)	(0.174)	(3.021)	(1.567)	(1.515)	(10.481)	(1.78)	(1.96)	(2.24)	(2.56)	(3.35)	(6.17)	(9.58)
3	L-608	.148	.136	3.207	1.318	1.274	9.056	1.80	2.00	2.26	2.80	3.95	5.65	7.50
	609	.125	.103	3.658	1.517	1.176	6.537	2.19	2.34	2.64	3.27	4.50	7.00	9.50
	610	.138	.135	3.284	1.340	1.315	9.306	1.90	2.09	2.40	2.95	4.00	5.75	7.50
		(0.137)	(0.125)	(3.383)	(1.392)	(1.255)	(8.300)	(1.96)	(2.14)	(2.43)	(3.01)	(4.15)	(6.13)	(8.17)
7	*L-358	.159	.165	2.700	.875	2.108	27.184	1.76	1.81	2.15	2.60	3.05	3.55	5.00
	359	.125	.133	3.109	1.070	1.818	17.380	2.15	2.30	2.56	2.95	3.44	4.25	7.00
	* 360	.210	.222	2.289	.736	1.159	13.051	1.36	1.53	1.78	2.17	2.74	3.20	4.00
		(0.165)	(0.173)	(2.699)	(0.894)	(1.695)	(19.204)	(1.76)	(1.88)	(2.16)	(2.57)	(3.08)	(3.67)	(5.33)
8	L-368	(.143)	(.122)	(3.364)	(1.414)	(1.450)	(10.464)	(2.00)	(2.18)	(2.45)	(3.05)	(3.91)	(6.00)	(9.00)
12	L-345	.210	.205	2.679	1.291	1.513	11.758	1.54	1.69	1.91	2.30	3.19	5.00	8.25
	346	.126	.128	3.018	.758	1.817	22.327	2.31	2.44	2.63	2.87	3.36	3.70	4.25
	347	.150	.161	2.765	.982	2.402	26.738	1.95	2.07	2.30	2.65	3.01	3.55	7.00
		(0.162)	(0.165)	(2.821)	(1.010)	(1.912)	(20.274)	(1.93)	(3.10)	(2.28)	(2.61)	(3.19)	(4.08)	(6.50)
19	L-332	.177	.172	2.796	1.383	1.612	12.318	1.45	1.61	1.95	2.54	3.20	4.50	9.05
	333	.075	.096	3.421	1.014	1.838	19.699	2.05	2.30	2.80	3.40	3.70	4.20	7.50
		(0.126)	(0.134)	(3.109)	(1.199)	(1.725)	(16.009)	(1.75)	(1.96)	(2.38)	(2.97)	(3.45)	(4.35)	(8.28)



Table 1.--Statistical measures of the phi grain-size distributions of 267 sandstone samples from the Salt Wash Member of the Morrison Formation--Continued

Map location	Sample No.	Mode	Median	Mean	St. dev.	Skew.	Kurt.	Ø2	Ø5	Ø16	Ø50	Ø84	Ø95	Ø98
		(mm)						(phi notation)						
24	L-482	0.125	0.129	3.044	1.156	1.329	11.654	1.53	1.79	2.23	2.95	3.55	4.45	7.00
	483	.210	.225	2.646	1.668	1.509	10.604	.90	1.30	1.73	2.20	3.22	5.25	9.50
	* 484	.072	.072	4.253	1.629	1.270	6.026	3.00	3.19	3.40	3.80	5.06	8.25	10.85
		(0.136)	(0.142)	(3.314)	(1.484)	(1.369)	(9.428)	(1.81)	(2.09)	(2.45)	(2.98)	(3.94)	(5.98)	(9.12)
27	*L-344	(.088)	(.103)	(3.374)	(.809)	(1.588)	(17.787)	(2.30)	(2.53)	(2.85)	(3.30)	(3.62)	(4.25)	(5.50)
28	L-393	.210	.213	2.381	1.032	1.614	23.628	1.27	1.45	1.75	2.25	2.85	3.40	4.25
	394	.125	.151	2.744	.766	1.614	20.954	1.79	1.97	2.23	2.74	3.17	3.50	3.75
		(0.168)	(0.182)	(2.563)	(0.899)	(1.614)	(22.291)	(1.53)	(1.71)	(1.99)	(2.50)	(3.01)	(3.45)	(4.00)
29	L-816	.352	.343	1.712	.848	1.087	9.549	.60	.80	1.12	1.54	2.22	3.25	4.00
	817	.125	.132	3.154	1.383	1.555	12.581	1.72	1.89	2.21	2.92	3.69	4.65	9.00
	818	.210	.198	2.543	1.117	1.484	15.675	1.05	1.35	1.80	2.34	3.15	3.99	5.00
	819	.102	.104	3.491	1.000	2.227	26.868	2.51	2.73	2.95	3.27	3.70	4.34	7.00
		(0.197)	(0.194)	(2.725)	(1.087)	(1.588)	(16.168)	(1.47)	(1.69)	(2.02)	(2.52)	(3.19)	(4.06)	(6.25)
31	L-492	.209	.201	2.462	.668	1.084	11.724	1.55	1.70	1.98	2.30	2.80	3.35	4.00
	493	.209	.183	2.679	1.265	1.577	13.332	1.45	1.60	1.86	2.45	3.22	4.00	8.00
	494	.209	.200	2.622	1.330	1.486	11.002	1.35	1.50	1.81	2.35	3.13	4.50	8.00
	495	.209	.214	2.350	.971	1.547	16.234	1.22	1.36	1.66	2.20	2.85	3.96	4.50
		(0.209)	(0.200)	(2.529)	(1.059)	(1.424)	(13.073)	(1.39)	(1.54)	(1.83)	(2.33)	(3.00)	(3.95)	(6.13)
37	L-491	.098	.110	3.232	.777	.963	8.975	2.10	2.30	2.65	3.22	3.70	4.19	4.60
	500	.148	.158	2.794	1.155	1.595	15.592	1.45	1.65	2.00	2.65	3.35	4.00	7.00
	501	.203	.197	2.484	.871	1.756	21.148	1.55	1.66	1.92	2.35	2.91	3.35	4.50
		(0.150)	(0.155)	(2.837)	(0.934)	(1.438)	(15.238)	(1.70)	(1.87)	(2.19)	(2.74)	(3.32)	(3.85)	(5.37)
40	L-731	.075	.114	3.196	1.339	1.308	11.399	1.45	1.70	2.15	3.10	3.95	4.60	9.25
	732	.125	.124	3.026	.568	.129	-.692	2.15	2.32	2.57	3.01	3.47	3.85	4.13
	821	.419	.387	1.937	1.453	1.360	12.415	.52	.65	.89	1.39	3.19	3.66	4.25
	822	.144	.152	2.885	1.138	2.208	24.805	1.80	2.00	2.25	2.74	3.24	3.80	8.00
	* 823	.177	.177	2.685	1.220	1.393	12.422	1.18	1.50	1.92	2.50	3.25	4.01	8.00
	824	.121	.108	3.449	1.094	1.325	10.379	2.38	2.55	2.80	3.22	3.96	5.25	7.00
		(0.177)	(0.177)	(2.863)	(1.135)	(1.287)	(11.788)	(1.58)	(1.79)	(2.10)	(2.66)	(3.51)	(4.20)	(6.77)



Table 1.--Statistical measures of the phi grain-size distributions of 267 sandstone samples from the Salt Wash Member of the Morrison Formation--Continued

Map location	Sample No.	Mode (mm)	Median (mm)	Mean	St. dev.	Skew.	Kurt.	$\phi_2$	$\phi_5$	$\phi_{16}$	$\phi_{50}$	$\phi_{84}$	$\phi_{95}$	$\phi_{98}$
								(phi notation)						
45	*L-808	0.125	0.133	3.029	1.139	2.073	21.882	1.95	2.20	2.55	2.90	3.27	3.90	8.00
	809	.109	.117	3.329	1.362	1.509	11.677	1.60	2.03	2.72	3.10	3.60	5.00	9.00
	810	.210	.236	2.292	1.198	1.925	18.408	1.25	1.40	1.69	2.06	2.51	3.40	8.00
	811	.218	.220	2.547	1.444	1.695	13.485	1.38	1.55	1.80	2.20	3.00	4.25	8.75
		(0.166)	(0.172)	(2.799)	(1.286)	(1.801)	(16.363)	(1.55)	(1.80)	(2.19)	(2.57)	(3.10)	(4.14)	(8.44)
56	L- 14	.145	.156	2.717	.633	.378	1.161	1.70	1.90	2.27	2.70	3.19	3.90	4.50
	15	.155	.161	2.685	.581	.385	1.570	1.75	1.95	2.23	2.55	3.15	3.75	4.25
	16	.150	.164	2.612	.416	.827	6.033	2.00	2.20	2.35	2.61	2.91	3.50	3.95
	17	.121	.119	3.168	.703	.467	1.705	2.30	2.50	2.70	3.10	3.55	4.41	4.90
	18	.166	.191	2.312	.626	.266	1.673	1.29	1.46	1.75	2.40	2.90	3.15	4.00
	19	.092	.095	3.600	.743	.438	1.849	2.70	2.85	3.00	3.35	4.25	4.93	5.50
	20	.166	.197	2.469	.531	.504	4.625	1.80	1.90	2.04	2.35	2.70	3.25	4.40
		(0.142)	(0.155)	(2.795)	(0.605)	(0.466)	(2.659)	(1.93)	(2.11)	(2.77)	(2.72)	(3.24)	(3.84)	(4.50)
59	L-628	.500	.437	1.583	1.632	.921	6.570	-1.00	-.25	.45	1.20	3.10	3.75	5.75
	629	.125	.126	3.149	1.172	1.645	14.721	1.80	2.20	2.55	3.00	3.59	4.35	8.00
	630	.176	.206	2.347	1.133	1.227	13.834	.65	1.00	1.50	2.30	3.05	3.70	4.50
		(0.267)	(0.256)	(2.360)	(1.312)	(1.264)	(11.708)	(0.48)	(0.98)	(1.50)	(2.17)	(3.25)	(3.93)	(6.08)
61	*L- 50	.186	.173	2.684	.516	.624	2.394	1.90	2.05	2.23	2.56	3.09	3.35	4.26
	51	.240	.222	2.217	.625	.273	1.699	1.22	1.42	1.72	2.14	2.63	3.00	4.00
	52	.144	.163	2.680	.572	.484	2.093	1.80	1.95	2.22	2.61	3.10	3.70	4.50
	53	.143	.157	2.747	.627	1.014	6.981	1.90	2.09	2.31	2.65	3.10	3.75	4.65
	54	.121	.121	3.196	.625	1.601	17.309	2.10	2.29	2.61	3.06	3.68	4.50	5.00
		(0.167)	(0.167)	(2.705)	(0.593)	(0.799)	(6.095)	(1.78)	(1.96)	(2.22)	(2.60)	(3.12)	(3.66)	(4.48)
64	L-417	.088	.102	3.400	1.036	1.578	13.937	2.29	2.49	2.77	3.27	3.77	4.65	7.50
	418	.203	.202	2.501	.874	1.861	21.613	1.55	1.74	1.98	2.30	2.84	3.45	5.00
	419	.148	.143	3.000	1.101	1.898	17.263	2.10	2.25	2.52	2.80	3.35	4.15	7.00
	420	.088	.118	3.177	.906	1.242	12.001	1.95	2.15	2.55	3.10	3.56	4.25	6.00
	* 422	.125	.139	2.918	1.123	1.120	9.366	1.25	1.55	2.10	2.85	3.54	4.15	7.50
		(0.130)	(0.141)	(2.999)	(1.008)	(1.540)	(14.836)	(1.83)	(2.04)	(2.38)	(2.86)	(3.41)	(4.13)	(6.60)



Table 1.--Statistical measures of the phi grain-size distributions of 267 sandstone samples from the Salt Wash Member of the Morrison Formation--Continued

Map location	Sample No.	Mode (mm)	Median (mm)	Mean	St. dev.	Skew.	Kurt.	Ø2	Ø5	Ø16	Ø50	Ø84	Ø95	Ø98
		(phi notation)												
71	*L-2762	0.064	0.065	4.649	1.986	1.032	3.105	3.02	3.08	3.29	3.94	5.42	10.26	10.70
	* 2763	.131 (0.098)	.129 (0.097)	3.402 (4.026)	1.695 (1.841)	1.450 (1.241)	8.971 (6.038)	1.73 (2.38)	2.05 (2.57)	2.27 (2.78)	2.95 (3.45)	3.99 (4.71)	6.95 (8.61)	10.40 (10.55)
72	L-405	.250	.242	2.412	1.652	1.853	14.466	1.50	1.60	1.76	2.05	2.56	5.00	10.10
	406	.210	.240	2.328	1.266	1.842	15.780	1.45	1.57	1.77	2.06	2.46	3.50	8.00
	407	.148	.138	3.136	1.273	1.463	9.816	1.97	2.14	2.44	2.85	3.55	6.00	8.00
	461	.218 (0.207)	.192 (0.203)	3.586 (2.866)	2.680 (1.718)	.727 (1.471)	.980 (10.261)	1.18 (1.53)	1.33 (1.66)	1.67 (1.91)	2.35 (2.33)	6.95 (3.88)	9.55 (6.01)	11.00 (9.28)
73	L-812	.210	.220	2.405	1.282	1.690	17.881	.83	1.22	1.60	2.18	3.02	3.95	7.00
	813	.105	.123	3.137	1.319	1.582	12.121	1.55	1.77	2.12	3.00	3.77	4.60	8.50
	814	.228 (0.161)	.221 (0.188)	2.529 (2.690)	1.434 (1.345)	1.629 (1.634)	13.066 (14.356)	1.27 (1.22)	1.45 (1.48)	1.72 (1.81)	2.17 (2.45)	3.08 (3.29)	4.30 (4.28)	8.50 (8.00)
75	L-804	.177	.179	2.690	1.061	1.724	16.996	1.51	1.72	2.04	2.50	3.13	3.90	7.50
	805	.177	.180	2.631	1.223	1.871	18.520	1.31	1.57	1.90	2.46	3.02	3.75	8.00
	806	.088	.085	3.978	1.518	1.645	11.370	2.75	2.95	3.19	3.56	4.15	7.75	10.00
	807	.171 (0.153)	.162 (0.152)	2.846 (3.036)	1.051 (1.213)	2.294 (1.884)	18.457 (16.336)	1.80 (1.84)	1.95 (2.05)	2.20 (2.33)	2.62 (2.79)	3.25 (3.39)	4.00 (4.85)	8.00 (8.38)
81	L-834	.148	.137	3.358	1.708	1.217	6.541	1.74	1.90	2.23	2.87	4.12	7.50	10.00
	835	.088	.087	3.859	1.246	1.805	14.561	2.80	2.98	3.20	3.55	4.07	6.00	9.50
	836	.102 (0.113)	.104 (0.109)	3.426 (3.548)	1.309 (1.421)	1.822 (1.615)	16.096 (11.399)	2.07 (2.20)	2.31 (2.40)	2.69 (2.71)	3.21 (3.21)	3.70 (3.96)	4.75 (6.08)	9.50 (9.67)
86	L-631	.108	.124	3.012	.711	.390	3.457	1.80	2.04	2.45	3.01	3.51	3.90	4.25
	632	.129	.152	2.829	1.247	1.422	11.743	1.25	1.51	1.98	2.70	3.34	4.15	8.00
	633	.296	.327	1.726	1.030	2.016	21.804	.60	.82	1.20	1.60	2.05	2.80	5.50
	637	.125 (0.165)	.132 (0.184)	3.067 (2.659)	1.381 (1.092)	1.431 (1.315)	11.277 (12.070)	1.30 (1.24)	1.65 (1.51)	2.24 (1.97)	2.91 (2.56)	3.55 (3.11)	4.75 (3.90)	8.50 (6.56)
88	L-845	.105	.111	3.450	1.046	1.857	18.147	2.45	2.65	2.89	3.16	3.68	4.50	9.00
	846	.352	.332	1.792	.709	1.094	7.091	.95	1.07	1.27	1.60	2.36	3.15	3.60
	847	.088	.083	4.046	1.568	1.253	6.357	2.45	2.75	3.12	3.60	4.46	8.10	10.00
	848	.210	.227	2.322	1.371	1.042	9.110	.05	.93	1.45	2.15	3.00	4.25	7.00
	849	.105 (0.172)	.155 (0.182)	2.691 (2.860)	1.572 (1.253)	.650 (1.179)	7.126 (9.566)	-.75 (1.03)	.20 (1.52)	1.70 (2.09)	2.67 (2.64)	3.46 (3.39)	4.40 (4.88)	8.00 (7.52)



Table 1.--Statistical measures of the phi grain-size distributions of 267 sandstone samples from the Salt Wash Member of the Morrison Formation--Continued

Map location	Sample No.	Mode (mm)	Median (mm)	Mean	St. dev.	Skew.	Kurt.	$\phi_2$	$\phi_5$	$\phi_{16}$	$\phi_{50}$	$\phi_{84}$	$\phi_{95}$	$\phi_{98}$
								(phi notation)						
90	*L-488	0.148	0.163	2.739	0.819	2.238	28.256	1.75	1.94	2.13	2.60	3.19	3.63	4.50
	* 489	.148	.148	3.154	1.590	1.569	10.791	1.76	1.95	2.20	2.75	3.57	6.50	10.00
	490	.210	.225	2.375	1.100	1.704	17.473	1.29	1.45	1.71	2.16	2.81	3.85	5.50
		(0.169)	(0.179)	(2.756)	(1.170)	(1.837)	(18.840)	(1.60)	(1.78)	(2.01)	(2.50)	(3.19)	(4.66)	(6.67)
93	L- 31	.126	.138	3.067	1.177	1.817	15.320	2.10	2.25	2.45	2.89	3.35	4.25	7.60
	32	.089	.100	3.575	1.289	1.812	15.264	2.40	2.58	2.86	3.35	3.82	5.25	8.50
	33	.089	.112	3.270	1.109	1.658	15.339	1.80	2.13	2.55	3.19	3.51	4.10	8.75
		(0.101)	(0.117)	(3.304)	(1.192)	(1.762)	(15.308)	(2.10)	(2.32)	(2.63)	(3.14)	(3.56)	(4.53)	(8.28)
99	L-353	.176	.157	2.973	1.149	1.301	9.727	1.79	1.91	2.15	2.65	3.65	4.85	7.00
	354	.209	.186	2.643	1.063	1.705	17.589	1.59	1.76	1.97	2.40	3.10	4.00	6.50
	355	.225	.208	2.506	1.147	1.350	11.446	1.34	1.35	1.72	2.06	3.19	4.05	6.50
	356	.148	.146	3.009	1.031	1.478	11.920	2.05	2.16	2.36	2.78	3.60	4.80	6.50
	357	.296	.281	2.037	1.265	1.759	16.590	.77	.93	1.26	1.84	2.49	3.40	5.95
	366	.125	.117	3.252	1.279	1.164	7.210	1.95	2.12	2.45	3.09	3.98	6.00	7.75
	977	.125	.151	3.045	1.386	1.633	11.975	1.87	2.06	2.27	2.73	3.35	6.00	8.85
	978	.125	.144	3.018	1.255	1.354	9.779	1.63	1.84	2.21	2.79	3.47	5.37	8.30
		(0.179)	(0.174)	(2.810)	(1.197)	(1.468)	(12.030)	(1.62)	(1.77)	(2.05)	(2.57)	(3.35)	(4.81)	(7.17)
105	L- 34	.157	.162	2.676	.562	.371	1.640	1.80	1.95	2.21	2.62	3.10	3.50	4.10
	* 35	.148	.156	2.695	.567	.489	2.252	1.80	2.00	2.30	2.66	3.11	3.70	4.50
	36	.169	.173	2.609	.511	.530	3.515	1.76	1.95	2.16	2.50	2.96	3.40	4.00
	37	.090	.124	3.057	.586	.227	-.669	2.25	2.44	2.70	3.00	3.45	3.95	4.50
	38	.250	.221	2.244	.722	.383	.731	1.25	1.40	1.65	2.16	2.80	3.50	4.15
	39	.149	.154	2.701	.500	.780	3.111	2.00	2.10	2.34	2.70	3.18	3.55	4.25
	* 40	.137	.143	2.793	.570	.368	-.381	2.09	2.40	2.50	2.80	3.20	3.55	4.00
		(0.157)	(0.162)	(2.682)	(0.574)	(0.450)	(1.457)	(1.85)	(2.03)	(2.27)	(2.63)	(3.11)	(3.59)	(4.21)
107	L-636	.352	.300	2.230	1.140	3.908	51.863	.03	.45	.90	1.75	3.55	5.50	8.50
	843	.250	.245	2.424	1.771	1.076	6.668	.07	.60	1.17	2.04	3.50	5.25	8.75
	* 844	.352	.372	1.747	1.342	1.574	13.067	.55	.69	.95	1.44	2.30	4.15	6.75
		(0.318)	(0.306)	(2.134)	(1.418)	(2.186)	(23.866)	(0.22)	(0.58)	(1.01)	(1.74)	(3.12)	(4.97)	(8.00)



Table 1.--Statistical measures of the phi grain-size distributions of 267 sandstone samples from the Salt Wash Member of the Morrison Formation--Continued

Map location	Sample No.	Mode (mm)	Median (mm)	Mean	St. dev.	Skew.	Kurt.	$\phi_2$	$\phi_5$	$\phi_{16}$	$\phi_{50}$	$\phi_{84}$	$\phi_{95}$	$\phi_{98}$
								(phi notation)						
112	L-502	0.203	0.203	2.567	1.140	1.874	18.259	1.52	1.66	1.92	2.30	2.85	4.00	7.00
	503	.217	.234	2.396	1.559	1.788	14.644	1.00	1.25	1.61	2.10	2.70	4.00	9.10
	504	.148	.145	2.941	.890	1.521	14.729	1.93	2.05	2.30	2.80	3.44	4.09	6.00
		(0.189)	(0.227)	(2.635)	(1.196)	(1.728)	(15.877)	(1.48)	(1.65)	(1.94)	(2.40)	(3.00)	(4.03)	(7.37)
115	L-341	.210	.177	2.899	1.079	1.850	17.064	1.98	2.06	2.20	2.50	3.35	4.50	7.00
	342	.296	.312	1.839	.950	2.517	34.147	1.02	1.15	1.35	1.70	2.20	3.00	4.00
	* 3447	.089	.085	3.774	1.192	1.491	11.858	2.14	2.36	3.03	3.56	4.40	5.93	8.10
	* 3449	.107	.094	3.847	1.748	1.082	4.467	2.06	2.16	2.52	3.41	4.72	8.24	9.93
		(0.176)	(0.167)	(3.090)	(1.242)	(1.735)	(16.884)	(1.80)	(1.93)	(2.28)	(2.79)	(3.67)	(5.42)	(7.26)
121	L-605	.125	.130	3.293	1.350	1.285	8.342	2.00	2.11	2.40	2.95	4.00	6.00	8.00
	606	.165	.151	3.110	1.457	1.204	7.468	1.60	1.76	2.10	2.72	3.94	6.00	8.25
	* 607	.137	.128	3.350	1.450	1.266	7.495	2.00	2.12	2.40	2.98	4.05	6.50	9.00
		(0.142)	(0.136)	(3.251)	(1.419)	(1.252)	(7.768)	(1.87)	(2.00)	(2.30)	(2.88)	(4.00)	(6.17)	(8.42)
124	*L-190	.134	.132	3.225	1.310	1.392	8.924	1.93	2.15	2.39	2.91	3.65	5.75	9.00
	191	.177	.185	2.624	.980	1.679	17.170	1.55	1.75	2.01	2.44	3.01	3.54	6.50
		(0.156)	(0.159)	(2.925)	(1.145)	(1.536)	(13.047)	(1.74)	(1.95)	(2.20)	(2.68)	(3.33)	(4.65)	(7.75)
125	L-557	.077	.074	4.206	1.436	1.106	5.516	2.65	2.95	3.27	3.75	5.15	7.25	9.25
	558	.143	.107	3.559	1.365	.897	6.243	2.15	2.30	2.60	3.21	4.40	6.25	7.75
	559	.088	.087	3.832	1.192	1.209	7.513	2.45	2.65	3.05	3.52	4.39	6.25	8.25
		(0.103)	(0.089)	(3.866)	(1.331)	(1.071)	(6.424)	(2.42)	(2.61)	(2.97)	(3.49)	(4.65)	(6.58)	(8.42)
130	L-485	.125	.124	3.143	.981	1.815	19.290	2.14	2.28	2.55	3.01	3.51	4.10	7.00
	486	.295	.308	1.847	.944	2.276	27.215	.97	1.13	1.35	1.70	2.23	2.90	4.00
	487	.352	.338	1.768	.994	1.757	19.381	.75	.90	1.11	1.56	2.27	3.15	4.00
		(0.257)	(0.257)	(2.253)	(0.973)	(1.949)	(21.962)	(1.19)	(1.44)	(1.67)	(2.09)	(2.67)	(3.38)	(5.00)
133	L-379	(.250)	(.252)	(2.198)	(1.069)	(1.662)	(17.003)	(1.19)	(1.35)	(1.60)	(2.00)	(2.76)	(3.75)	(5.00)
135	*L-321	(.105)	(.129)	(3.050)	(1.105)	(1.518)	(15.266)	(1.55)	(1.80)	(2.29)	(2.99)	(3.54)	(4.15)	(6.50)
136-A	L- 95	.211	.183	2.684	1.042	.847	4.776	1.35	1.55	1.90	2.45	3.40	4.60	5.50
	98	.121	.125	3.151	1.053	.710	3.756	1.45	1.80	2.30	3.00	3.78	5.00	6.50
	106	.149	.154	2.916	1.024	1.223	8.978	1.70	1.90	2.23	2.70	3.46	4.60	6.25
		(0.160)	(0.154)	(2.917)	(1.040)	(0.927)	(5.837)	(1.50)	(1.75)	(2.14)	(2.72)	(3.55)	(4.73)	(6.08)

Table 1.--Statistical measures of the phi grain-size distributions of 267 sandstone samples from the Salt Wash Member of the Morrison Formation--Continued

Map location	Sample No.	Mode (mm)	Median (mm)	Mean	St. dev.	Skew.	Kurt.	$\phi_2$	$\phi_5$	$\phi_{16}$	$\phi_{50}$	$\phi_{84}$	$\phi_{95}$	$\phi_{98}$
		(phi notation)												
136-B	L-334	0.106	0.119	3.174	1.181	1.417	12.053	1.55	1.81	2.36	3.09	3.59	4.50	8.00
	335	.089	.096	3.580	1.229	1.741	15.306	2.30	2.50	2.89	3.38	3.90	5.40	8.75
	336	.105	.125	3.259	1.559	1.187	7.444	1.47	1.69	2.11	3.01	3.93	6.75	8.75
	337	.106	.100	3.803	1.583	1.239	6.602	2.26	2.45	2.81	3.32	4.24	7.75	9.20
		(0.102)	(0.110)	(3.454)	(1.388)	(1.396)	(10.351)	(1.90)	(2.11)	(2.54)	(3.20)	(3.92)	(6.10)	(8.68)
138	*L-343	(.088)	(.096)	(3.512)	(1.032)	(1.163)	(9.640)	(2.08)	(2.53)	(2.75)	(3.38)	(4.05)	(5.30)	(7.00)
142	L-331	.177	.172	2.608	.823	.886	7.203	1.25	1.60	1.99	2.52	3.11	3.55	5.50
	* 388	.210	.216	2.454	1.181	1.761	16.171	1.23	1.40	1.79	2.21	2.79	3.80	8.00
	* 389	.125	.118	3.307	1.188	1.461	10.288	2.27	2.42	2.66	3.07	3.69	6.00	8.25
	* 390	.125	.104	3.633	1.546	1.374	8.370	2.31	2.50	2.74	3.25	4.15	7.50	10.00
		(0.159)	(0.153)	(3.001)	(1.185)	(1.371)	(10.508)	(1.77)	(1.98)	(2.30)	(2.76)	(3.44)	(5.21)	(7.94)
146	L-625	.083	.080	4.038	1.322	1.386	8.744	2.85	3.02	3.30	3.65	4.55	7.00	9.00
	* 626	.134	.166	2.854	1.476	1.394	10.142	1.36	1.55	1.90	2.60	3.51	5.25	8.00
	627	.210	.220	2.601	1.388	1.180	7.328	1.24	1.40	1.70	2.20	3.50	5.25	7.25
		(0.142)	(0.155)	(3.164)	(1.395)	(1.320)	(8.738)	(1.82)	(1.99)	(2.30)	(2.82)	(3.85)	(5.83)	(8.08)
148	*L-825	.144	.156	2.851	1.355	1.669	14.910	1.35	1.59	1.99	2.68	3.35	4.20	9.00
	* 826	.203	.207	2.482	1.331	1.734	15.734	1.07	1.32	1.65	2.27	2.97	3.85	8.00
	827	.210	.206	2.514	1.122	1.786	17.521	1.40	1.55	1.84	2.30	2.94	3.65	7.50
	* 828	.259	.243	2.184	1.106	1.343	12.501	.75	1.15	1.55	2.05	2.65	3.50	6.50
	829	.177	.196	2.543	1.149	1.726	17.277	1.05	1.27	1.66	2.34	2.95	3.45	8.00
	830	.183	.165	2.940	1.438	1.667	12.686	1.60	1.81	2.10	2.60	3.28	5.50	9.00
		(0.196)	(0.196)	(2.571)	(1.250)	(1.654)	(15.105)	(1.20)	(1.45)	(1.80)	(2.37)	(3.02)	(4.03)	(8.00)
150	L- 45	.210	.197	2.663	1.338	1.651	13.538	.40	.60	.86	1.35	2.19	3.00	7.50
	46	.143	.156	2.515	.695	2.246	27.829	1.75	1.86	2.13	2.55	3.20	3.80	6.00
	47	.274	.282	1.853	.817	.226	2.926	.50	.90	1.29	1.86	2.45	3.10	4.50
		(0.209)	(0.212)	(2.344)	(0.950)	(1.374)	(14.764)	(0.88)	(1.12)	(1.43)	(1.93)	(2.91)	(3.30)	(6.00)
151	L-377	.088	.117	3.121	.691	1.018	12.342	2.06	2.29	2.62	3.10	3.48	3.74	4.00
	378	.125	.125	3.082	.895	1.953	24.302	2.05	2.29	2.60	3.01	3.45	3.76	5.00
		(0.107)	(0.121)	(3.104)	(0.793)	(1.485)	(18.322)	(2.06)	(2.29)	(2.61)	(3.06)	(3.47)	(3.75)	(4.50)



Table 1.--Statistical measures of the phi grain-size distributions of 267 sandstone samples from the Salt Wash Member of the Morrison Formation--Continued

Map location	Sample No.	Mode (mm)	Median (mm)	Mean	St. dev.	Skew.	Kurt.	$\phi_2$	$\phi_5$	$\phi_{16}$	$\phi_{50}$	$\phi_{84}$	$\phi_{95}$	$\phi_{98}$
								(phi notation)						
159	L-736	0.195	0.188	2.459	0.693	0.119	0.390	1.30	1.50	1.85	2.41	3.05	3.55	4.00
	737	.125	.159	2.637	.572	.310	1.486	1.70	1.86	2.14	2.66	3.10	3.50	4.00
	850	.105	.107	3.432	1.214	1.900	18.734	2.00	2.30	2.74	3.25	3.70	4.25	9.50
	851	.177	.182	2.456	.820	2.038	26.843	1.50	1.69	2.05	2.46	2.90	3.27	4.00
	* 852	.341	.352	1.909	1.284	1.769	15.836	.76	.90	1.14	1.55	2.40	4.00	7.00
	* 2955	.153	.168	2.775	1.190	2.551	29.306	1.43	2.01	2.14	2.57	2.99	3.96	6.84
		(0.183)	(0.193)	(2.611)	(0.962)	(1.448)	(15.433)	(1.45)	(1.71)	(2.01)	(2.48)	(3.02)	(3.76)	(5.89)
160	L-508	.165	.152	2.951	1.092	1.597	14.620	1.80	1.95	2.20	2.72	3.44	4.30	6.50
	509	.088	.102	3.581	1.514	1.601	10.939	2.27	2.41	2.75	3.30	3.81	6.75	10.10
	510	.125	.137	3.183	1.594	1.633	11.187	1.85	2.04	2.36	2.89	3.45	7.00	10.10
	511	.088	.102	3.601	1.361	1.851	14.874	2.45	2.66	2.95	3.30	3.65	6.00	10.00
		(0.117)	(0.123)	(3.329)	(1.390)	(1.671)	(12.905)	(2.09)	(2.27)	(2.57)	(3.05)	(3.59)	(6.01)	(9.18)
161	L-496	.176	.180	2.625	.928	1.463	14.506	1.55	1.72	1.99	2.47	3.11	3.85	5.25
	497	.148	.159	2.702	.868	2.070	23.162	1.75	1.94	2.23	2.65	3.01	3.55	6.00
	498	.121	.117	3.253	1.022	1.832	18.437	2.30	2.43	2.72	3.10	3.51	4.15	6.50
	499	.364	.382	1.777	1.500	1.729	13.596	.65	.76	.99	1.40	2.06	4.00	9.00
		(0.202)	(0.210)	(2.589)	(1.080)	(1.774)	(17.425)	(1.56)	(1.71)	(1.98)	(2.41)	(2.92)	(3.89)	(6.69)
162	L-300	.149	.146	2.863	.692	1.429	14.886	2.00	2.15	2.38	2.78	3.32	3.82	4.25
	301	.125	.115	3.328	1.043	1.588	14.260	2.35	2.56	2.80	3.14	3.69	4.75	7.50
	* 302	.125	.119	3.230	1.186	1.641	13.770	1.95	2.16	2.56	3.06	3.62	4.40	8.00
		(0.133)	(0.127)	(3.140)	(0.974)	(1.553)	(14.305)	(2.10)	(2.29)	(2.58)	(2.99)	(3.54)	(4.32)	(6.58)
163	*L-312	.210	.199	2.428	.893	1.306	12.145	1.34	1.51	1.81	2.32	2.94	3.40	5.50
	391	.210	.182	2.571	.899	1.590	17.859	1.45	1.65	1.96	2.44	3.04	3.55	4.00
		(0.210)	(0.191)	(2.500)	(0.896)	(1.448)	(15.002)	(1.40)	(1.58)	(1.89)	(2.38)	(2.99)	(3.49)	(4.75)
165	L-330	(.149)	(.143)	(3.051)	(1.225)	(1.663)	(12.212)	(2.00)	(2.16)	(2.46)	(2.80)	(3.50)	(5.00)	(8.25)
171	L-339	.210	.187	2.733	1.257	1.505	11.629	1.61	1.75	1.95	2.42	3.27	4.25	8.00
173	L-505	.233	.228	2.338	1.129	1.594	14.030	1.23	1.39	1.66	2.11	2.81	3.70	6.50
	506	.226	.263	2.048	1.100	1.565	14.883	.76	.96	1.30	1.91	2.46	3.20	5.50
		(0.230)	(0.246)	(2.193)	(1.115)	(1.580)	(14.456)	(1.00)	(1.18)	(1.48)	(2.01)	(2.64)	(3.45)	(6.00)

Table 1.--Statistical measures of the phi grain-size distributions of 267 sandstone samples from the Salt Wash Member of the Morrison Formation--Continued

Map location	Sample No.	Mode (mm)	Median (mm)	Mean	St. dev.	Skew.	Kurt.	Ø2	Ø5	Ø16	Ø50	Ø84	Ø95	Ø98
								(phi notation)						
174	L-215	0.088	0.088	3.671	0.814	1.565	17.298	2.60	2.84	3.15	3.50	4.09	4.65	5.50
	216	.075	.079	3.895	1.095	1.702	12.882	2.96	3.14	3.35	3.65	4.22	6.00	8.90
	217	.177	.205	2.430	.957	1.585	15.765	1.35	1.51	1.81	2.27	2.84	3.60	6.00
	218	.074	.093	3.419	.830	.911	8.263	2.10	2.35	2.68	3.43	3.81	4.30	5.25
	219	.088	.095	3.737	.979	1.959	18.724	2.75	2.95	3.20	3.45	3.75	5.00	8.00
	220	.088	.093	3.577	.764	2.134	27.663	2.60	2.85	3.13	3.45	3.74	4.35	6.00
	221	.138	.146	2.907	.964	1.846	19.503	1.90	2.06	2.33	2.77	3.30	4.00	6.00
	222	.088	.090	3.627	.663	.935	10.727	2.68	2.80	3.06	3.49	3.95	4.50	5.00
	223	.258	.278	1.882	.714	1.282	14.146	1.00	1.15	1.45	1.81	2.34	2.90	3.50
	224	.195	.203	2.489	.715	1.044	12.134	1.53	1.73	1.96	2.30	2.92	3.52	3.95
		(0.127)	(0.137)	(3.163)	(0.850)	(1.496)	(15.711)	(2.15)	(2.34)	(2.61)	(3.01)	(3.50)	(4.28)	(5.81)
175	L-743	.080	.084	3.678	1.084	1.684	17.170	1.85	2.40	3.23	3.56	3.99	4.75	8.00
	* 744	.102	.102	3.418	.884	1.666	19.398	2.25	2.47	2.86	3.31	3.81	4.25	5.75
		(0.091)	(0.093)	(3.548)	(0.984)	(1.675)	(18.284)	(2.05)	(2.44)	(3.05)	(3.44)	(3.90)	(4.50)	(7.88)
177	L-349	.212	.175	2.799	1.424	1.166	7.524	1.28	1.39	1.75	2.50	3.59	5.50	8.00
	* 350	.211	.218	2.624	.908	1.094	8.571	1.22	1.43	1.75	2.20	2.86	3.95	5.50
	351	.106	.124	3.164	.835	.944	9.276	1.98	2.17	2.54	3.04	3.56	4.30	6.00
	352	.089	.091	3.813	1.245	1.239	7.487	2.33	2.57	3.03	3.47	4.37	6.45	8.85
		(0.155)	(0.152)	(3.100)	(1.103)	(1.112)	(8.215)	(1.70)	(1.89)	(2.27)	(2.80)	(3.60)	(5.05)	(7.09)
178	L-158	.250	.233	2.380	1.277	1.115	7.217	.80	1.10	1.51	2.10	3.10	4.60	6.50
	159	.210	.198	2.450	.777	1.033	12.464	1.40	1.58	1.86	2.30	2.99	3.50	4.00
	* 160	.210	.216	2.446	1.077	1.615	16.609	.40	.56	.80	1.19	1.99	2.87	4.50
	227	.188	.216	2.387	1.192	1.593	13.692	1.15	1.33	1.60	2.21	2.90	4.00	8.00
	228	.088	.109	3.264	1.195	1.245	9.827	1.75	1.95	2.30	3.13	3.65	5.25	8.00
	229	.296	.278	2.082	.934	.648	2.503	.90	1.10	1.39	1.82	3.08	3.75	4.20
	231	.250	.192	2.626	1.196	.951	6.981	1.25	1.40	1.70	2.40	3.55	4.40	5.90
		(0.213)	(0.206)	(2.519)	(1.093)	(1.171)	(9.899)	(1.09)	(1.29)	(1.59)	(2.16)	(3.04)	(4.05)	(5.87)
179	L-329	.297	.320	1.698	.508	.870	5.746	.99	1.11	1.35	1.64	2.10	2.45	2.75
	381	.297	.297	1.822	.591	.774	3.566	1.02	1.16	1.40	1.76	2.25	2.70	3.50
	383	.125	.129	3.295	1.459	1.501	10.051	2.13	2.28	2.55	2.95	3.72	6.25	9.25
	384	.129	.138	3.156	1.283	1.484	10.162	2.04	2.15	2.40	2.86	3.61	5.75	8.50
		(0.212)	(0.221)	(2.493)	(0.960)	(1.157)	(7.381)	(1.55)	(1.68)	(1.93)	(2.30)	(2.92)	(4.29)	(6.00)



Table 1.--Statistical measures of the phi grain-size distributions of 267 sandstone samples from the Salt Wash Member of the Morrison Formation--Continued

Map location	Sample No.	Mode (mm)	Median (mm)	Mean	St. dev.	Skew.	Kurt.	$\phi_2$	$\phi_5$	$\phi_{16}$	$\phi_{50}$	$\phi_{84}$	$\phi_{95}$	$\phi_{98}$
								(phi notation)						
181	*L-615	0.203	0.207	2.858	1.832	1.054	4.349	1.00	1.30	1.75	2.30	3.70	7.50	9.00
	616	.125	.131	3.158	1.305	1.624	13.561	1.80	2.05	2.40	2.95	3.61	4.50	8.00
	617	.218	.200	2.615	1.308	1.299	9.428	1.20	1.40	1.73	2.32	3.35	4.35	8.00
		(0.182)	(0.179)	(2.877)	(1.482)	(1.326)	(9.113)	(1.33)	(1.58)	(1.96)	(2.52)	(3.55)	(5.45)	(8.33)
182	L- 1	.177	.194	2.705	1.338	1.425	10.390	1.47	1.65	1.90	2.37	3.30	5.00	8.00
	2	.170	.233	2.131	.592	.212	.106	1.21	1.33	1.61	2.10	2.60	3.00	3.33
	576	.088	.095	3.522	.917	1.899	20.332	2.45	2.65	3.00	3.40	3.75	4.50	7.00
	582	.088	.103	3.368	.752	1.748	22.134	2.43	2.60	2.90	3.29	3.60	4.00	4.50
	588	.088	.100	3.497	.879	2.000	23.112	2.51	2.74	3.00	3.34	3.70	4.25	6.50
		(0.122)	(0.145)	(3.045)	(0.896)	(1.457)	(15.215)	(2.01)	(2.19)	(2.48)	(2.90)	(3.39)	(4.15)	(5.87)
184	L- 41	.297	.300	1.841	.649	1.022	4.650	1.10	1.25	1.40	1.75	2.25	3.00	4.00
	43	.297	.302	1.787	.585	1.033	5.060	1.15	1.25	1.41	1.90	2.19	2.75	3.75
		(0.297)	(0.301)	(1.824)	(0.617)	(1.028)	(4.855)	(1.13)	(1.25)	(1.41)	(1.73)	(2.22)	(2.88)	(3.88)
189	L-611	.250	.222	2.302	.809	.271	.037	1.20	1.35	1.60	2.18	3.10	3.80	4.25
	612	.250	.264	1.970	.645	.403	1.173	1.00	1.22	1.50	1.91	2.45	3.00	3.50
	* 613	.250	.255	2.035	.681	.453	1.279	1.15	1.31	1.56	1.96	2.55	3.20	3.75
	* 614	1.400	.965	.366	1.390	1.018	6.330	-1.15	-1.06	-.71	.06	1.31	3.00	4.50
	820	.125	.125	3.039	1.096	2.191	25.047	2.02	2.19	2.46	2.88	3.41	4.00	8.00
		(0.455)	(0.366)	(1.942)	(0.924)	(0.867)	(6.773)	(0.84)	(1.00)	(1.28)	(1.80)	(2.56)	(3.40)	(4.80)
194	L-340	(.125)	(.139)	(3.145)	(1.259)	(1.608)	(11.636)	(2.17)	(2.30)	(2.50)	(2.85)	(3.62)	(5.50)	(8.50)
197	L-799	.148	.151	2.968	1.163	1.421	11.119	1.77	1.91	2.19	2.71	3.45	5.00	7.00
	800	.148	.160	2.932	1.422	1.492	11.067	1.57	1.74	2.05	2.65	3.40	5.25	8.90
	801	.210	.225	2.400	1.177	1.748	16.293	1.33	1.50	1.75	2.16	2.74	4.05	7.00
		(0.169)	(0.179)	(2.767)	(1.254)	(1.554)	(12.826)	(1.56)	(1.72)	(2.00)	(2.51)	(3.20)	(4.77)	(7.63)
199	L-621	.125	.123	3.141	.842	1.493	15.105	2.30	2.50	2.73	3.04	3.50	4.10	5.50
	622	.296	.309	1.825	.785	1.239	10.587	.90	1.06	1.31	1.70	2.30	3.15	4.00
	623	.277	.246	2.139	1.133	.924	8.109	.55	.81	1.25	2.02	2.05	3.70	4.50
	624	.056	.055	4.466	1.364	.767	5.608	2.54	3.15	3.60	4.20	5.18	7.50	8.75
		(0.139)	(0.183)	(2.893)	(1.031)	(1.106)	(9.852)	(1.57)	(1.88)	(2.22)	(2.74)	(3.26)	(4.61)	(5.69)

Table 1.--Statistical measures of the phi grain-size distributions of 267 sandstone samples from the Salt Wash Member of the Morrison Formation--Continued

Map location	Sample No.	Mode (mm)	Median (mm)	Mean	St. dev.	Skew.	Kurt.	Ø2	Ø5	Ø16	Ø50	Ø84	Ø95	Ø98
		(phi notation)												
200	L- 55	0.176	0.166	2.824	0.868	1.291	9.576	1.55	1.90	2.14	2.60	3.35	4.51	5.75
	56	.095	.096	3.688	1.018	.766	3.516	2.50	2.68	2.95	3.40	4.35	4.74	7.00
	57	.165	.185	2.460	.670	.258	1.460	1.31	1.52	1.90	2.42	2.91	3.55	4.60
	58	.151	.159	2.685	.778	1.048	9.331	1.55	1.75	2.11	2.65	3.10	3.75	5.00
	59	.146	.146	2.924	.872	1.478	11.235	2.10	2.20	2.40	2.78	3.35	4.50	6.00
	60	.265	.268	2.085	.959	1.099	7.441	.95	1.11	1.39	1.90	2.62	3.90	5.00
		(0.166)	(0.170)	(2.778)	(0.861)	(0.990)	(7.093)	(1.66)	(1.86)	(2.15)	(2.63)	(3.28)	(4.16)	(5.56)
201	L- 21	.106	.105	3.718	1.684	1.300	7.026	2.20	2.40	2.69	3.26	4.16	8.00	10.00
	22	.089	.107	3.443	1.107	1.533	12.007	2.30	2.50	2.79	3.24	3.65	5.50	7.75
	23	.178	.167	2.963	1.311	1.431	8.997	1.80	1.94	2.15	2.57	3.40	6.00	8.00
		(0.124)	(0.126)	(3.375)	(1.367)	(1.421)	(9.343)	(2.10)	(2.28)	(2.54)	(3.02)	(3.74)	(6.50)	(8.58)
203	L- 24	.297	.302	1.802	.664	.732	3.451	.90	1.07	1.35	1.71	2.25	3.00	3.75
	25	.148	.136	3.012	.754	.626	2.675	1.99	2.25	2.50	2.90	3.50	4.40	4.90
	26	.125	.134	2.935	.721	.644	3.385	1.90	2.15	2.56	2.90	3.35	4.05	4.56
	27	.126	.184	2.582	.666	.421	1.665	1.78	1.85	2.01	2.41	3.02	4.00	4.80
	* 28	.190	.200	2.452	.882	.593	3.056	1.10	1.35	1.82	2.30	3.01	4.10	5.00
		(0.177)	(0.191)	(2.557)	(0.737)	(0.603)	(2.846)	(1.53)	(1.73)	(2.05)	(2.44)	(3.03)	(3.91)	(4.60)
208	L-400	.125	.143	2.945	1.054	1.806	18.022	1.80	2.05	2.36	2.81	3.40	4.05	7.00
	401	.210	.220	2.396	1.127	1.619	16.280	1.19	1.35	1.66	2.18	3.01	3.63	6.00
	402	.210	.212	2.473	1.275	1.487	13.727	1.05	1.34	1.70	2.24	3.09	4.00	7.00
		(0.182)	(0.192)	(2.605)	(1.135)	(1.637)	(16.010)	(1.35)	(1.58)	(1.91)	(2.41)	(3.17)	(3.89)	(6.67)
214	L-239	.148	.178	2.682	1.365	1.571	11.809	1.26	1.40	1.84	2.50	3.06	5.00	9.00
	240	.117	.132	3.070	1.029	1.728	16.541	2.00	2.20	2.50	2.95	3.35	4.25	7.00
	286	.250	.178	2.573	1.108	1.034	7.845	1.25	1.44	1.70	2.49	3.25	4.00	6.50
		(0.172)	(0.163)	(2.775)	(1.167)	(1.444)	(12.065)	(1.50)	(1.68)	(2.01)	(2.65)	(3.22)	(4.47)	(7.50)
215	*L-398	.210	.212	2.418	1.022	1.691	17.348	1.27	1.48	1.77	2.25	2.85	3.57	6.00
	399	.125	.123	3.146	.968	1.742	17.983	2.17	2.35	2.65	3.02	3.50	4.00	6.50
	634	.273	.275	2.042	1.027	1.724	16.795	1.04	1.20	1.44	1.85	2.49	3.50	5.00
	635	.125	.125	3.175	1.090	1.769	16.093	2.19	2.35	2.61	3.00	3.54	4.15	7.50
		(0.183)	(0.184)	(2.695)	(1.027)	(1.732)	(17.055)	(1.67)	(1.85)	(2.12)	(2.53)	(3.10)	(3.81)	(6.25)



Table 1.--Statistical measures of the phi grain-size distributions of 267 sandstone samples from the Salt Wash Member of the Morrison Formation--Continued

Map location	Sample No.	Mode	Median	Mean	St. dev.	Skew.	Kurt.	$\phi_2$	$\phi_5$	$\phi_{16}$	$\phi_{50}$	$\phi_{84}$	$\phi_{95}$	$\phi_{98}$
		(mm)						(phi notation)						
222	*L-831	0.296	0.288	2.028	1.339	1.622	14.430	0.50	0.82	1.24	1.80	2.60	3.55	8.00
	832	.125	.138	2.914	1.054	1.492	14.592	1.50	1.75	2.24	2.85	3.39	3.90	7.00
	* 833	.125	.145	1.960	1.418	1.265	9.511	1.20	1.50	2.00	2.80	3.55	5.00	8.00
		(0.182)	(0.190)	(2.301)	(1.270)	(1.460)	(12.844)	(1.07)	(1.36)	(1.83)	(2.48)	(3.18)	(4.15)	(7.67)
231	L-233	.148	.181	2.545	1.062	1.474	14.751	1.20	1.36	1.75	2.49	3.07	4.00	6.00
	234	.148	.163	2.868	1.354	1.163	7.611	1.30	1.50	1.88	2.61	3.56	5.25	7.75
	235	.250	.236	2.236	1.044	1.261	11.200	.96	1.15	1.45	2.10	2.86	3.70	5.00
	* 268	.225	.236	2.198	.936	1.522	16.500	1.15	1.33	1.64	2.10	2.64	3.35	4.50
	269	.297	.238	1.162	1.523	.779	6.242	-1.20	-.65	.56	1.55	2.45	4.00	6.50
	270	.297	.260	2.224	1.449	1.075	7.340	.30	1.00	1.23	1.95	3.15	4.50	7.50
	272	.297	.174	2.538	1.559	1.141	6.447	.95	1.15	1.40	2.10	3.47	5.75	8.50
	275	.148	.138	3.020	1.050	1.626	16.289	1.80	2.00	2.26	2.85	3.51	4.25	7.00
234		(0.226)	(0.203)	(2.349)	(1.247)	(1.255)	(10.798)	(0.81)	(1.47)	(1.52)	(2.22)	(3.09)	(4.35)	(6.59)
	*L-803	(.154)	(.167)	(3.092)	(1.937)	(.923)	(2.983)	(1.17)	(1.33)	(1.63)	(2.59)	(3.95)	(7.75)	(8.75)

BASIC ANALYTICAL DATA SUMMARIZED IN  
U.S. GEOLOGICAL SURVEY PROFESSIONAL  
PAPER 556 BY ROBERT A. CADIGAN, 1967

Table 2.--Statistical measures of the phi grain-size distributions of 59 sandstone samples from the Recapture Member of the Morrison Formation

[Map location refers to sample locality number on plate 1 of Professional Paper 556. Data were obtained by mechanical grain-size analysis. St. dev., standard deviation; Skew., skewness; Kurt., kurtosis; percentiles in phi terms are shown as  $\phi_2$  (second percentile),  $\phi_5$  (fifth percentile), etc. Asterisk (\*) indicates thin-section modal analysis of sample is given in Professional Paper, table 13. Values in parentheses are location averages (means)]

Map location	Sample	Mode	Median	Mean	St. dev.	Skew.	Kurt	$\phi_2$	$\phi_5$	$\phi_{16}$	$\phi_{50}$	$\phi_{84}$	$\phi_{95}$	$\phi_{98}$
		(mm)			(phi notation)									
7	*L-565	0.209	0.235	2.192	0.892	1.309	8.870	1.00	1.20	1.55	2.10	2.67	3.28	4.25
	* 570	0.148	0.137	2.748	0.757	2.395	30.976	2.04	2.15	2.36	2.70	3.06	3.45	4.25
		(0.179)	(0.186)	(2.470)	(0.825)	(1.852)	(19.923)	(1.52)	(1.68)	(1.96)	(2.40)	(2.87)	(3.37)	(4.25)
28	L-392	(0.148)	(0.150)	(2.885)	(1.162)	(2.186)	(20.732)	(2.03)	(2.20)	(2.42)	(2.74)	(3.10)	(3.75)	(8.50)
49	L-837	0.105	0.107	3.787	1.778	1.308	6.547	2.35	2.52	2.84	3.21	4.15	9.25	10.60
	* 838	0.105	0.120	3.874	2.470	1.217	4.646	2.20	2.37	2.64	3.09	4.00	13.00*	15.00*
	839	0.209	0.195	2.564	1.066	2.364	29.982	1.55	1.75	2.00	2.35	2.87	3.50	6.00
		(0.139)	(0.141)	(3.408)	(1.771)	(1.630)	(13.725)	(2.03)	(2.21)	(2.49)	(2.88)	(3.67)	(8.58)	(10.53)
78	L-650	0.086	0.086	3.756	0.995	2.423	26.292	3.00	3.20	3.35	3.55	3.94	5.00	7.75
	651	0.148	0.165	2.750	1.325	2.227	22.050	1.70	1.83	2.10	2.60	3.01	3.80	9.00
	652	0.121	0.103	3.109	1.433	1.770	16.741	1.40	1.65	2.25	2.96	3.59	4.25	9.50
		(0.118)	(0.118)	(3.205)	(1.251)	(2.140)	(21.694)	(2.03)	(2.23)	(2.53)	(3.04)	(3.51)	(4.35)	( 8.75)
79	L-767	0.176	0.162	2.854	1.384	1.668	14.531	1.38	1.59	1.98	2.62	3.43	4.25	8.75
	768	0.209	0.205	2.593	1.434	2.233	21.433	1.50	1.69	1.95	2.30	2.79	3.35	10.00
	* 769	0.210	0.209	2.565	1.239	2.225	23.158	1.60	1.77	1.95	2.26	2.75	3.40	8.50
	770	0.196	0.187	2.615	1.235	2.126	22.989	1.44	1.80	1.94	2.42	3.00	3.76	7.50
		(0.198)	(0.191)	(2.657)	(1.323)	(2.063)	(20.528)	(1.48)	(1.71)	(1.96)	(2.40)	(2.99)	(3.69)	( 8.69)
83	L-787	0.088	0.093	3.618	0.969	1.761	15.977	2.75	2.89	3.05	3.42	3.82	5.25	8.00
	788	0.125	0.117	3.205	0.852	1.860	22.934	2.35	2.53	2.80	3.05	3.53	3.92	5.00
	* 789	0.125	0.127	3.095	1.023	2.281	28.192	2.30	2.45	2.69	3.00	3.37	3.95	6.00
		(0.113)	(0.112)	(3.306)	(0.948)	(1.967)	(22.368)	(2.47)	(2.62)	(2.85)	(3.16)	(3.57)	(4.37)	( 6.33)
92	*L-781	0.210	0.233	2.333	1.553	2.187	22.088	0.98	1.20	1.55	2.11	2.69	3.35	8.50



Table 2.--Statistical measures of the phi grain-size distributions of 59 sandstone samples from  
the Recapture Member of the Morrison Formation--Continued

Map location	Sample	Mode	Median	Mean	St. dev.	Skew.	Kurt.	$\phi_2$	$\phi_5$	$\phi_{16}$	$\phi_{50}$	$\phi_{84}$	$\phi_{95}$	$\phi_{98}$
		(mm)		(phi notation)										
	* 782	0.210	0.220	2.342	1.146	2.267	25.638	0.80	1.17	1.55	2.16	2.76	3.45	9.00
	* 783	0.210	0.215	2.454	1.398	2.379	26.580	1.30	1.50	1.80	2.20	2.72	3.50	9.50
		(0.210)	(0.225)	(2.376)	(1.366)	(2.278)	(24.769)	(1.03)	(1.29)	(1.63)	(2.16)	(2.72)	(3.43)	(9.00)
114	L-707	0.125	0.122	3.212	1.173	2.000	20.803	2.00	2.29	2.65	3.05	3.54	4.00	8.50
	708	0.341	0.302	2.010	1.367	2.044	21.796	0.80	0.94	1.16	1.70	2.76	3.25	7.00
	709	0.088	0.094	3.638	1.144	1.638	12.743	2.57	2.80	3.00	3.41	3.92	5.00	8.75
	710	0.117	0.122	3.228	1.298	1.530	12.050	1.75	2.05	2.50	3.05	3.60	4.75	9.25
		(0.171)	(0.160)	(3.022)	(1.246)	(1.803)	(16.848)	(1.78)	(2.02)	(2.44)	(2.80)	(3.46)	(4.23)	(8.38)
118	L-758	0.065	0.071	3.969	1.089	2.018	19.394	3.12	3.28	3.50	3.79	4.22	5.00	9.00
	* 759	0.122	0.126	3.083	1.055	2.098	24.934	1.95	2.14	2.52	3.00	3.41	3.87	6.00
	* 760	0.125	0.127	3.286	1.571	1.566	10.013	2.10	2.27	2.50	2.94	3.51	7.50	10.00
		(0.104)	(0.108)	(3.446)	(1.238)	(1.894)	(18.114)	(2.39)	(2.56)	(2.84)	(3.24)	(3.71)	(5.44)	(8.33)
124	*L-192	0.148	0.150	2.890	1.016	1.978	20.925	1.85	2.02	2.33	2.72	3.29	3.75	6.00
	* 193	0.134	0.138	3.054	1.083	1.615	14.116	2.01	2.16	2.43	2.85	3.02	4.50	8.00
		(0.134)	(0.135)	(3.130)	(1.171)	(1.645)	(14.250)	(2.03)	(2.19)	(2.39)	(2.89)	(3.34)	(5.25)	(7.67)
128	L-655	0.088	0.120	3.278	1.575	1.159	6.730	1.51	1.73	2.10	3.05	4.00	6.00	9.50
	* 656	0.154	0.166	2.952	1.471	1.841	13.178	2.00	2.05	2.24	2.60	3.07	6.00	9.60
		(0.121)	(0.143)	(3.115)	(1.523)	(1.500)	(9.954)	(1.76)	(1.89)	(2.17)	(2.83)	(3.54)	(6.00)	(9.55)
135	L-320	(0.105)	(0.117)	(3.229)	(0.901)	(1.870)	(21.600)	(2.37)	(2.54)	(2.78)	(3.10)	(3.50)	(4.00)	(5.25)
140	*L-722	0.250	0.255	2.128	1.088	2.110	25.144	1.05	1.26	1.55	2.00	2.64	3.25	4.00
151	L-376	0.125	0.132	3.024	0.948	2.120	24.673	2.16	2.31	2.56	2.91	3.36	3.75	6.00
	720	0.121	0.135	2.902	0.811	1.406	17.023	1.80	1.99	2.32	2.90	3.35	3.70	4.10
		(0.123)	(0.134)	(2.963)	(0.879)	(1.763)	(20.848)	(1.98)	(2.15)	(2.44)	(2.91)	(3.36)	(3.73)	(5.05)
163	*L-206	0.125	0.143	2.903	0.815	2.101	28.862	2.04	2.16	2.39	2.81	3.34	3.69	4.10
	207	0.148	0.145	2.929	0.932	1.874	21.995	1.90	2.05	2.34	2.80	3.40	3.81	5.00
	209	0.105	0.126	3.101	0.971	1.720	16.169	2.05	2.25	2.52	3.00	3.40	3.85	8.00
		(0.126)	(0.138)	(2.978)	(0.906)	(1.898)	(22.342)	(2.00)	(2.15)	(2.42)	(2.87)	(3.38)	(3.78)	(5.70)

Table 2. --Statistical measures of the phi grain-size distributions of 59 sandstone samples from the Recapture Member of the Morrison Formation--Continued

Map location	Sample	Mode	Median	Mean	St. dev.	Skew.	Kurt.	$\phi_2$	$\phi_5$	$\phi_{16}$	$\phi_{50}$	$\phi_{84}$	$\phi_{95}$	$\phi_{98}$
		(mm)						(phi notation)						
172	*L-753	0.250	0.277	2.008	1.229	2.543	31.675	0.97	1.12	1.41	1.85	2.35	2.93	4.50
	754	0.072	0.105	3.503	1.789	1.211	7.545	1.45	1.69	2.20	3.25	4.30	7.10	10.15*
		(0.161)	(0.191)	(2.756)	(1.509)	(1.877)	(19.610)	(1.21)	(1.41)	(1.81)	(2.55)	(3.33)	(4.02)	(7.33)
175	L-745	0.125	0.156	2.822	1.557	1.186	8.826	0.50	1.07	1.83	2.66	3.47	5.50	8.50
	746	0.177	0.182	2.717	1.339	2.032	19.837	1.52	1.73	2.01	2.45	3.06	4.10	8.50
	747	0.130	0.153	2.780	1.555	2.488	26.916	1.95	2.10	2.34	2.66	2.98	3.60	9.00
	* 748	0.143	0.157	2.780	1.180	2.012	18.975	1.65	1.85	2.15	2.60	3.06	3.90	9.00
		(0.144)	(0.162)	(2.775)	(1.408)	(1.930)	(18.638)	(1.41)	(1.69)	(2.08)	(2.59)	(3.14)	(4.28)	(8.75)
195	L-714	(0.122)	(0.097)	(3.940)	(2.051)	(1.299)	(6.302)	(2.30)	(2.56)	(2.86)	(3.36)	(4.24)	(9.50)	(12.00)
207	L-771	0.177	0.173	2.873	1.714	1.463	10.870	1.00	1.26	1.71	2.55	3.68	5.25	10.75*
	772	0.500	0.338	1.905	1.849	1.742	14.481	0.15	0.47	0.84	1.55	2.51	3.80	9.00
	776	0.134	0.143	3.004	1.263	1.800	17.300	1.60	1.93	2.31	2.81	3.55	4.45	8.50
		(0.270)	(0.218)	(2.594)	(1.609)	(1.668)	(14.217)	(0.92)	(1.22)	(1.63)	(2.30)	(3.25)	(4.50)	(9.42)
209	L-638	0.125	0.136	2.960	0.937	2.090	24.929	2.05	2.24	2.50	2.90	3.35	3.90	5.00
	639	0.088	0.100	3.507	1.082	1.878	17.786	2.40	2.59	2.90	3.33	3.75	4.55	8.25
	640	0.209	0.195	2.684	1.531	1.585	13.090	1.20	1.41	1.80	2.39	3.20	5.00	9.50
		(0.141)	(0.144)	(3.050)	(1.183)	(1.851)	(18.602)	(1.88)	(2.08)	(2.40)	(2.87)	(3.43)	(4.48)	(7.58)
210	L-643	0.129	0.149	2.864	1.257	1.525	14.375	1.25	1.54	2.00	2.75	3.42	4.15	7.00
	* 742	0.125	0.127	3.508	1.889	0.891	3.124	1.20	1.65	2.22	2.99	4.45	8.00	9.50
		(0.127)	(0.138)	(3.186)	(1.573)	(1.208)	( 8.750)	(1.23)	(1.60)	(2.11)	(2.87)	(3.94)	(6.08)	(8.25)
230	*L-618	0.144	0.168	2.669	1.154	1.584	16.565	1.20	1.42	1.82	2.56	3.30	4.00	6.00
	619	0.125	0.148	2.681	0.709	0.682	5.953	1.54	1.75	2.03	2.75	3.15	3.50	4.00
	* 620	0.125	0.128	3.110	1.064	1.922	20.927	2.02	2.35	2.65	2.96	3.50	4.25	6.50
	702	0.125	0.152	2.947	1.728	1.357	8.843	0.75	1.24	1.89	2.71	3.50	6.50	10.50
	703	0.125	0.132	3.143	1.471	1.839	14.921	1.85	2.07	2.42	2.92	3.45	4.50	10.10
	706	0.250	0.255	2.319	1.827	1.391	8.827	0.10	0.74	1.29	1.96	2.79	7.25	9.15
		(0.149)	(0.164)	(2.812)	(1.326)	(1.463)	(12.673)	(1.24)	(1.76)	(2.02)	(2.64)	(3.27)	(5.00)	(7.71)

BASIC ANALYTICAL DATA  
SUMMARIZED BY U. S. GEOLOGICAL  
SURVEY PROFESSIONAL PAPER 556  
BY ROBERT A. CADIGAN, 1967



Table 3. --Statistical measures of the phi grain-size distributions of 59 sandstone samples from the Westwater Canyon Member of the Morrison Formation

[Map location refers to sample locality number on plate 1 of Professional Paper 556. Data were obtained by mechanical grain-size analysis. St. dev., standard deviation; Skew., skewness; Kurt., kurtosis; percentiles in phi terms are shown as  $\phi_2$  (second percentile),  $\phi_5$  (fifth percentile), etc. Single asterisk (\*) indicates thin-section modal analysis of sample is given in Professional Paper, table 19; double asterisk (\*\*) indicates extrapolation. Values in parentheses are location averages (means)]

Map location	Sample No.	Mode	Median	Mean	St. dev.	Skew.	Kurt.	$\phi_2$	$\phi_5$	$\phi_{16}$	$\phi_{50}$	$\phi_{84}$	$\phi_{95}$	$\phi_{98}$
		mm		phi notation										
7	*L-566	0.177	0.181	2.689	1.070	1.504	11.439	1.57	1.79	2.05	2.46	3.00	4.50	7.00
	* 571	0.209	0.212	2.343	0.986	2.103	26.840	1.20	1.40	1.77	2.20	2.70	3.15	4.50
		(0.193)	(0.197)	(2.516)	(1.028)	(1.804)	(19.140)	(1.39)	(1.60)	(1.91)	(2.33)	(2.85)	(3.83)	(5.75)
28	L-371	0.210	0.203	2.509	1.178	1.623	13.548	1.30	1.50	1.81	2.05	2.89	3.75	7.50
	* 372	0.125	0.122	3.130	0.892	2.102	22.861	2.30	2.46	2.75	3.01	3.46	3.75	5.00
	* 373	0.125	0.153	2.738	1.049	1.866	20.221	1.44	1.66	2.10	2.70	3.16	3.55	6.00
		(0.153)	(0.159)	(2.792)	(1.040)	(1.864)	(18.877)	(1.68)	(1.87)	(2.22)	(2.59)	(3.17)	(3.68)	(6.17)
30	L-327	(0.189)	(0.184)	(2.711)	(1.285)	(1.585)	(12.644)	(1.36)	(1.56)	(1.90)	(2.44)	(3.19)	(4.10)	(8.00)
49	*L-725	0.130	0.143	3.007	1.240	1.909	16.884	1.98	2.15	2.43	2.80	3.35	4.25	8.25
	726	0.177	0.178	2.773	1.182	1.629	13.629	1.55	1.77	2.09	2.49	3.15	4.70	7.00
	840	0.210	0.194	2.766	1.702	1.703	12.763	1.34	1.53	1.87	2.38	3.06	6.00	10.00
		(0.172)	(0.172)	(2.849)	(1.375)	(1.747)	(14.425)	(1.62)	(1.82)	(2.13)	(2.56)	(3.19)	(4.98)	(8.42)
78	L-647	0.250	0.240	2.519	1.842	1.387	8.623	0.75	1.10	1.50	2.06	3.10	7.00	9.15
	648	0.203	0.198	2.642	1.423	1.482	11.042	1.10	1.45	1.82	2.33	3.07	5.50	8.00
	649	0.154	0.165	3.033	1.866	1.551	10.268	1.25	1.64	2.05	2.61	3.39	8.00	9.50
		(0.202)	(0.201)	(2.731)	(1.710)	(1.473)	(9.978)	(1.03)	(1.40)	(1.79)	(2.33)	(3.19)	(6.83)	(8.88)
79	*L-777	0.218	0.235	2.414	1.761	1.598	12.174	0.60	0.97	1.40	2.10	2.90	5.50	9.15**
	778	0.500	0.413	1.776	2.053	1.150	5.982	-0.65	-0.10	0.50	1.25	2.70	7.00	9.05**
		(0.359)	(0.324)	(2.095)	(1.907)	(1.374)	(9.078)	(-0.03)	(0.44)	(0.95)	(1.68)	(2.80)	(6.25)	(9.10)
83	L-790	0.225	0.236	2.602	2.060	1.677	11.165	1.17	1.35	1.61	2.08	2.80	8.00	12.75**
	791	0.177	0.165	2.729	0.793	2.084	26.182	1.82	2.00	2.20	2.60	3.10	3.65	4.25
	* 792	0.203	0.172	2.756	1.055	1.781	18.226	1.65	1.81	2.07	2.55	3.19	4.10	6.50
		(0.202)	(0.191)	(2.696)	(1.303)	(1.847)	(18.524)	(1.55)	(1.72)	(1.96)	(2.41)	(3.03)	(5.25)	(7.83)

Table 3.--Statistical measures of the phi grain-size distributions of 59 sandstone samples from the Westwater Canyon Member of the Morrison Formation--Continued

Map location	Sample No.	Mode mm	Median mm	Mean	St. dev.	Skew.	Kurt.	$\phi_2$	$\phi_5$	$\phi_{16}$	$\phi_{50}$	$\phi_{84}$	$\phi_{95}$	$\phi_{98}$
								phi notation						
92	*L-784	0.277	0.255	2.373	1.746	2.378	19.660	0.85	1.06	1.40	1.96	2.90	5.50	9.10*
	* 785	0.553	0.467	1.541	1.861	1.471	9.541	-0.16	0.10	0.51	1.10	2.11	6.00	8.75
	* 786	0.352	0.302	2.049	1.433	1.283	8.578	0.45	0.75	1.11	1.79	2.69	5.50	7.75
		(0.394)	(0.341)	(1.988)	(1.680)	(1.711)	(12.593)	(0.38)	(0.64)	(1.01)	(1.62)	(2.57)	(5.67)	(8.53)
114	L-863	(0.296)	(0.295)	(2.508)	(2.331)	(1.068)	(3.829)	(0.55)	(0.65)	(1.08)	(1.76)	(3.20)	(8.75)	(10.50**)
118	L-761	0.144	0.157	3.086	1.829	1.438	8.310	1.45	1.75	2.14	2.67	3.30	8.50	10.00
	762	0.250	0.262	2.171	1.328	1.812	15.125	1.04	1.25	1.50	1.94	2.51	3.50	8.25
	* 763	0.177	0.173	2.754	1.377	2.143	21.507	1.55	1.74	2.04	2.54	3.13	3.75	10.00
		(0.190)	(0.197)	(2.670)	(1.511)	(1.798)	(14.981)	(1.35)	(1.58)	(1.89)	(2.38)	(2.98)	(5.25)	(9.42)
124	*L-195	0.148	0.167	2.721	1.079	1.894	18.846	1.50	1.75	2.15	2.56	3.05	3.70	8.00
	* 196	0.148	0.162	2.959	1.516	1.477	9.066	1.55	1.76	2.11	2.62	3.28	7.50	9.10
	* 197	0.250	0.250	2.584	1.758	1.103	4.584	1.15	1.30	1.55	2.00	3.50	7.25	8.70
		(0.182)	(0.193)	(2.755)	(1.451)	(1.491)	(10.832)	(1.40)	(1.60)	(1.94)	(2.39)	(3.28)	(6.15)	(8.60)
128	L-653	0.134	0.151	2.983	1.641	1.968	15.699	1.80	1.95	2.27	2.74	3.15	4.50	10.10
	* 654	0.138	0.160	2.776	1.417	1.776	17.104	1.20	1.40	1.85	2.62	3.30	4.00	8.50
		(0.136)	(0.156)	(2.879)	(1.529)	(1.872)	(16.402)	(1.50)	(1.68)	(2.06)	(2.68)	(3.23)	(4.25)	(9.30)
135	L-319	(0.211)	(0.220)	(2.403)	(1.274)	(1.788)	(16.352)	(1.10)	(1.34)	(1.65)	(2.20)	(2.89)	(3.60)	(7.50)
140	*L-721	0.242	0.234	2.459	1.452	1.286	7.791	1.00	1.25	1.54	2.11	3.10	5.50	8.00
151	L-374	0.148	0.154	2.725	0.689	2.156	31.142	1.96	2.06	2.30	2.70	3.07	3.43	3.75
	375	0.148	0.157	2.808	0.970	2.113	22.970	1.90	2.05	2.25	2.66	3.11	3.65	6.00
	716	0.210	0.204	2.447	0.964	1.638	16.846	1.37	1.55	1.84	2.30	2.90	3.50	6.00
	717	0.210	0.227	2.232	0.817	1.264	13.276	1.20	1.35	1.65	2.14	2.72	3.20	4.00
		(0.179)	(0.185)	(2.553)	(0.825)	(1.793)	(21.059)	(1.61)	(1.75)	(2.26)	(2.45)	(2.93)	(3.45)	(4.94)
163	L-208	0.125	0.128	3.058	0.978	2.053	23.504	2.05	2.23	2.54	2.94	3.41	3.87	6.00
	210	0.177	0.195	2.483	0.758	1.899	22.867	1.60	1.75	2.02	2.34	2.75	3.15	4.50
		(0.151)	(0.162)	(2.771)	(0.867)	(1.976)	(23.371)	(1.83)	(1.99)	(2.28)	(2.64)	(3.08)	(3.51)	(5.25)
172	L-711	0.125	0.142	3.515	2.191	1.185	4.930	1.80	1.95	2.30	2.81	4.05	10.00	11.50
	* 712	0.125	0.122	3.207	1.184	1.988	20.359	2.00	2.25	2.69	3.05	3.50	4.00	8.00
	713	0.125	0.146	3.037	1.500	1.846	14.692	1.80	1.99	2.29	2.76	3.31	4.25	10.00
		(0.125)	(0.137)	(3.253)	(1.625)	(1.673)	(13.327)	(1.87)	(2.06)	(2.43)	(2.87)	(3.63)	(6.08)	(9.83)



Table 3.--Statistical measures of the phi grain-size distributions of 59 sandstone samples from  
the Westwater Canyon Member of the Morrison Formation--Continued

Map location	Sample No.	Mode	Median	Mean	St. dev.	Skew.	Kurt.	$\phi_2$	$\phi_5$	$\phi_{16}$	$\phi_{50}$	$\phi_{84}$	$\phi_{95}$	$\phi_{98}$
		mm						phi notation						
175	L-749	0.352	0.358	1.843	1.806	1.829	14.316	0.43	0.61	0.91	1.45	2.17	4.00	11.00*
	* 750	0.250	0.273	1.972	1.401	1.584	16.152	-0.25	0.61	1.31	1.89	2.42	3.45	8.50
	751	0.177	0.184	2.668	0.991	2.442	26.423	1.85	2.00	2.15	2.40	2.76	3.50	7.25
	752	0.233	0.247	2.306	1.555	1.733	13.444	0.95	1.13	1.48	2.02	2.56	5.00	9.00
		(0.253)	(0.266)	(2.197)	(1.438)	(1.897)	(17.509)	(0.75)	(1.09)	(1.46)	(1.94)	(2.48)	(3.99)	(8.94)
195	L-715	0.353	0.312	2.451	2.039	1.628	9.956	1.06	1.20	1.37	1.80	2.92	9.00	12.00*
	727	0.125	0.152	2.973	1.612	1.690	13.655	1.13	1.55	2.02	2.73	3.43	4.90	10.00
		(0.239)	(0.232)	(2.712)	(1.826)	(1.659)	(11.806)	(1.10)	(1.38)	(1.70)	(2.27)	(3.18)	(6.95)	(11.00)
207	L-773	0.196	0.187	2.667	1.384	2.058	18.689	1.55	1.74	2.00	2.40	2.90	3.75	9.25
	774	0.287	0.291	2.023	1.475	1.763	15.376	0.60	0.80	1.15	1.30	2.51	3.55	8.50
	775	0.353	0.440	1.511	1.764	1.535	10.956	-0.44	0.08	0.56	1.20	1.90	5.00	8.50
		(0.279)	(0.306)	(2.067)	(1.541)	(1.785)	(15.007)	(0.57)	(0.87)	(1.24)	(1.47)	(2.44)	(4.10)	(8.75)
209	L-641	0.296	0.313	1.959	1.904	0.977	5.998	-0.65	-0.20	0.60	1.66	3.04	5.50	8.50
	642	0.250	0.243	2.349	1.690	1.279	8.612	0.30	0.70	1.24	2.05	3.06	5.50	8.25
		(0.273)	(0.278)	(2.154)	(1.797)	(1.128)	( 7.305)	(-0.18)	(0.25)	(0.92)	(1.86)	(3.05)	(5.50)	(8.38)
210	L-644	0.148	0.167	2.807	1.481	1.522	11.615	1.15	1.45	1.87	2.56	3.31	5.00	8.25
	645	0.352	0.383	1.624	1.649	1.433	10.677	-0.80	0.15	0.60	1.31	2.30	4.25	8.00
	* 646	0.250	0.255	2.671	2.301	1.174	5.138	0.60	0.90	1.38	2.00	3.50	8.50	10.50
		(0.250)	(0.275)	(2.367)	(1.810)	(1.376)	( 9.143)	(0.32)	(0.83)	(1.28)	(1.96)	(3.04)	(5.92)	(8.92)
215	*L-395	0.148	0.156	2.933	1.137	1.651	12.120	1.62	1.90	2.17	2.64	3.27	5.00	8.50
	* 396	0.148	0.136	3.264	1.382	1.192	5.841	2.10	2.30	2.56	2.90	3.85	6.65	8.00
	* 397	0.210	0.197	2.541	0.932	1.741	18.181	1.58	1.75	1.98	2.34	2.86	3.70	6.00
		(0.169)	(0.163)	(2.913)	(1.210)	(1.528)	(12.047)	(1.77)	(1.98)	(2.24)	(2.63)	(3.33)	(5.12)	(7.50)
230	*L-704	0.210	0.214	2.601	1.748	1.593	10.445	1.07	1.33	1.66	2.25	2.88	8.00	9.75
	* 705	0.297	0.266	2.499	2.058	1.236	5.706	0.76	0.95	1.30	1.86	3.04	8.50	9.50
		(0.254)	(0.240)	(2.550)	(1.903)	(1.415)	( 8.076)	(0.92)	(1.14)	(1.48)	(2.06)	(2.96)	(8.25)	(9.63)

BASIC ANALYTICAL DATA  
SUMMARIZED BY U.S. GEOLOGICAL  
SURVEY PROFESSIONAL PAPER 556  
BY ROBERT A. CADIGAN, 1967

Table 4.--Statistical measures of the phi grain-size distributions of 53 sandstone samples from  
the Brushy Basin Member of the Morrison Formation

[Map location refers to sample locality number on plate 1 of Professional Paper 556. Data were obtained by mechanical grain-size analysis. St. dev., standard deviation; Skew., skewness; Kurt., kurtosis; percentiles in phi terms are shown as  $\phi_2$  (second percentile),  $\phi_5$  (fifth percentile), etc. Asterisk (\*) indicates thin-section modal analysis of sample is given in Professional Paper, table 20. Values in parentheses are location averages (means)]

Map location	Sample No.	Mode	Median	Mean	St. dev.	Skew.	Kurt.	$\phi_2$	$\phi_5$	$\phi_{16}$	$\phi_{50}$	$\phi_{84}$	$\phi_{95}$	$\phi_{98}$
		mm		phi notation										
7	*L-568	0.148	0.124	3.466	1.484	1.074	5.385	2.00	2.16	2.44	3.01	4.40	6.50	8.50
	* 569	.217	.250	2.045	.818	1.171	12.038	.90	1.10	1.46	2.00	2.45	2.90	4.00
		(0.183)	(0.187)	(2.756)	(1.151)	(1.123)	(8.712)	(1.45)	(1.63)	(1.95)	(2.51)	(3.43)	(4.70)	(6.25)
24	*L-674	(.105)	(.146)	(2.622)	(1.926)	(.379)	(3.291)	(-1.40)	(-.65)	(.95)	(2.75)	(3.85)	(5.25)	(8.00)
28	*L-370	(.125)	(.125)	(3.275)	(1.286)	(1.376)	(9.385)	(2.00)	(2.15)	(2.53)	(3.00)	(3.63)	(5.75)	(8.50)
31	L-694	.210	.210	2.441	1.251	1.545	13.287	1.00	1.24	1.61	2.26	2.95	3.85	7.50
	* 695	.296	.311	1.843	1.791	1.055	7.201	-1.10*	-.45	.75	2.10	2.60	5.00	8.10
		(0.253)	(0.261)	(2.142)	(1.521)	(1.300)	(10.244)	(-0.05)	(0.40)	(1.18)	(2.18)	(2.78)	(4.43)	(7.80)
37	*L-698	(.352)	(.413)	(1.267)	(1.325)	(.889)	(8.784)	(-1.10)	(-.65)	(.25)	(1.25)	(2.05)	(3.10)	(5.00)
56	*L- 89	.273	.273	1.193	.654	.709	2.863	1.08	1.21	1.46	1.88	2.33	2.90	3.75
59	*L-672	.203	.181	2.799	1.520	1.231	7.695	1.25	1.45	1.76	2.40	3.60	6.00	8.50
61	*L-136	.149	.143	3.225	1.357	1.119	5.583	1.88	2.05	2.30	2.80	4.05	6.25	7.50
	137	.125	.141	2.967	.873	1.349	11.737	1.99	2.15	2.38	2.83	3.45	4.30	5.50
	1494	.109	.121	3.290	1.557	.787	3.331	.95	1.52	2.08	3.05	4.25	6.05	8.60
		(0.128)	(0.135)	(3.161)	(1.262)	(1.085)	(6.884)	(1.61)	(1.91)	(2.25)	(2.89)	(3.92)	(5.53)	(7.20)
64	L-413	.088	.093	3.863	1.527	1.746	11.849	2.75	2.94	3.15	3.40	3.86	7.75	10.50
	414	.154	.158	3.019	1.523	1.486	10.275	1.77	1.95	2.16	2.67	3.30	7.25	9.10
	415	.258	.262	2.262	1.588	1.936	16.492	1.06	1.25	1.50	1.92	2.67	3.80	8.50
	416	.250	.256	2.033	.879	2.195	29.998	1.22	1.35	1.59	1.96	2.34	2.75	3.75
		(0.188)	(0.192)	(2.794)	(1.379)	(1.841)	(17.154)	(1.70)	(1.87)	(2.10)	(2.49)	(3.04)	(5.39)	(7.96)
71	*L-3776	.230	.293	1.700	2.033	.865	6.596	-1.90	-1.40	.06	1.77	2.69	3.90	9.66
	* 3777	.323	.426	1.330	1.699	1.355	12.049	-1.45	-.65	.22	1.23	1.95	3.35	8.00
		(0.277)	(0.360)	(1.515)	(1.866)	(1.110)	(9.323)	(-1.68)	(-1.03)	(0.14)	(1.50)	(2.32)	(3.63)	(8.83)



Table 4.--Statistical measures of the phi grain-size distributions of 53 sandstone samples from  
the Brushy Basin Member of the Morrison Formation--Continued

Map location	Sample No.	Mode	Median	Mean	St. dev.	Skew.	Kurt.	$\phi_2$	$\phi_5$	$\phi_{16}$	$\phi_{50}$	$\phi_{84}$	$\phi_{95}$	$\phi_{98}$
		mm	phi notation											
73	*L-815	0.074	0.084	3.798	1.167	2.158	20.561	2.87	3.07	3.30	3.59	4.00	4.75	10.00
86	L-687	.210	.196	2.668	1.290	1.264	9.438	1.29	1.45	1.80	2.35	3.50	4.50	7.50
88	L-853	.242	.262	2.162	1.612	1.577	12.191	.25	.76	1.35	1.94	2.45	4.50	8.50
99	L-979	.296	.283	2.097	1.212	1.798	16.611	1.00	1.17	1.42	1.85	2.64	3.80	7.75
112	*L-678	.250	.268	1.956	.760	1.343	11.539	1.19	1.31	1.51	1.89	2.30	2.95	4.00
	680	.210	.230	2.355	1.336	1.778	16.517	.85	1.26	1.70	2.11	2.57	4.00	7.50
		(0.230)	(0.249)	(2.156)	(1.048)	(1.561)	(14.028)	(1.02)	(1.29)	(1.61)	(2.00)	(2.44)	(3.48)	(5.75)
115	*L-3450	.241	.229	2.279	1.416	1.721	15.876	.38	1.02	1.30	2.13	2.83	4.18	7.97
130	L-664	.418	.375	1.717	1.189	2.034	22.047	.69	.85	1.05	1.41	2.14	3.10	6.00
136-B	L-338	.330	.370	1.600	1.874	1.091	6.487	-1.22	-.70	.48	1.44	2.15	6.00	8.50
142	*L-387	.210	.217	2.639	1.893	1.273	7.099	.50	1.15	1.64	2.20	2.93	8.00	9.50
146	*L-665	.086	.084	3.964	1.323	1.401	8.754	2.76	2.95	3.20	3.56	4.40	7.00	9.00
	666	.105	.124	3.355	1.713	1.255	7.742	1.55	1.79	2.15	3.00	4.00	7.25	9.50
		(0.096)	(0.104)	(3.659)	(1.518)	(1.328)	(8.248)	(2.16)	(2.37)	(2.68)	(3.28)	(4.20)	(7.13)	(9.25)
159	*L-734	.225	.222	2.295	1.142	1.409	15.175	.75	1.11	1.45	2.19	2.96	3.56	7.00
	* 735	.125	.142	2.973	1.397	1.685	14.425	1.55	1.75	2.11	2.80	3.46	4.40	9.00
		(0.217)	(0.225)	(2.408)	(1.161)	(1.725)	(18.070)	(1.04)	(1.36)	(1.69)	(2.25)	(2.94)	(3.81)	(6.23)
161	L-682	.352	.368	1.593	1.530	1.762	16.872	-.60	-.04	.85	1.75	1.93	3.35	8.00
173	L-507	.148	.148	2.968	1.064	1.734	14.296	2.00	2.15	2.43	2.75	3.35	4.05	8.00
	676	.080	.105	3.606	2.076	1.270	6.820	1.00	1.80	2.50	3.24	3.84	11.00	13.10
		(0.114)	(0.127)	(3.287)	(1.570)	(1.502)	(10.558)	(1.50)	(1.98)	(2.47)	(3.00)	(3.60)	(7.53)	(10.55)
174	*L-211	.297	.288	2.001	1.125	1.612	13.597	.90	1.10	1.40	1.80	2.45	4.00	6.00
	212	.088	.095	3.694	1.383	1.168	6.201	1.17	1.35	1.74	2.40	3.25	6.00	8.00
	213	.148	.146	2.950	.910	1.691	16.095	2.01	2.10	2.31	2.77	3.35	4.05	6.25
	214	.353	.358	1.631	.813	1.638	20.254	.60	.81	1.10	1.50	2.03	2.55	4.00
		(0.222)	(0.222)	(2.569)	(1.058)	(1.527)	(14.037)	(1.17)	(1.44)	(1.64)	(2.12)	(2.74)	(4.15)	(6.06)
177	*L-528	.177	.158	3.170	1.659	1.063	4.848	1.55	1.75	2.06	2.66	4.10	7.00	8.50
	529	.062	.061	4.677	1.817	.688	1.518	2.50	2.80	3.26	4.05	6.35	8.75	10.05
		(0.120)	(0.110)	(3.923)	(1.738)	(0.876)	(3.183)	(2.03)	(2.28)	(2.66)	(3.36)	(5.23)	(7.88)	(9.28)
178	*L-225	.352	.262	2.364	1.351	.915	4.465	.85	1.05	1.32	1.94	3.55	4.80	7.00
181	*L-688	.218	.222	2.533	1.461	1.390	8.431	1.35	1.54	1.76	2.20	2.85	6.25	8.25

Table 4.--Statistical measures of the phi grain-size distributions of 53 sandstone samples from the Brushy Basin Member of the Morrison Formation--Continued

Map location	Sample No.	Mode	Median	Mean	St. dev.	Skew.	Kurt.	$\phi_2$	$\phi_5$	$\phi_{16}$	$\phi_{50}$	$\phi_{84}$	$\phi_{95}$	$\phi_{98}$
mm			phi notation											
189	L-685	1.185	1.028	0.459	1.979	1.445	10.076	-1.25	-1.15	-0.82	0.00	1.33	4.00	8.50
	* 686	.297	.358	1.385	1.651	.980	9.326	-1.50	-1.00	-.05	1.49	2.30	3.50	6.00
		(0.741)	(0.693)	(0.922)	(1.815)	(1.213)	(9.701)	(-1.38)	(-1.08)	(-0.45)	(0.75)	(1.82)	(3.75)	(7.25)
199	L-684	.134	.217	2.118	1.493	.607	5.877	-1.05	-.20	1.05	2.20	3.03	4.00	7.00
208	*L-409	.250	.267	2.119	1.210	1.632	15.254	.98	1.21	1.54	1.90	2.65	3.92	5.75
	412	.088	.089	3.926	1.387	1.439	9.873	2.48	2.63	3.10	3.50	4.35	6.25	9.50
		(0.169)	(0.178)	(3.023)	(1.298)	(1.536)	(12.564)	(1.73)	(1.92)	(2.32)	(2.70)	(3.50)	(5.09)	(7.63)
214	*L-241	.148	.160	2.994	1.624	1.290	6.940	1.30	1.55	2.01	2.65	3.34	7.50	9.25
	* 243	.176	.212	2.557	1.413	1.289	7.705	1.20	1.40	1.68	2.24	3.00	5.75	8.00
	* 244	.148	.158	2.870	1.168	1.528	10.924	1.75	1.94	2.22	2.65	3.14	5.50	7.95
	245	.352	.350	1.822	1.532	1.321	8.054	.15	.46	.89	1.51	2.29	6.00	7.55
		(0.206)	(0.220)	(2.561)	(1.434)	(1.357)	(8.406)	(1.10)	(1.44)	(1.70)	(2.26)	(2.94)	(6.18)	(8.19)
221	*L-2317	.500	.515	1.360	1.963	1.514	11.211	-.88	-.44	.21	.96	2.16	4.01	12.30

BASIC ANALYTICAL DATA  
SUMMARIZED BY U.S. GEOLOGICAL  
SURVEY PROFESSIONAL PAPER 556  
BY ROBERT A. CADIGAN, 1967



Table 5.--Mineral ratios obtained in the disaggregated light-grain and heavy-mineral studies of 253 sandstone samples from the Salt Wash Member of the Morrison Formation

[Map location refers to sample locality number on plate 1 of Professional Paper 556 . Q, quartz; F, potassic and sodic feldspar; SRF, silicified-rock fragments including tuff; M, miscellaneous; O, opaques; NO, nonopaques; Z, zircon; T, tourmaline; G, garnet; S, staurolite; R, rutile; A, apatite; E, epidote. Values in parentheses are location averages (means)]

Map location	Sample No.	Light-grain study				Heavy-mineral study, with ratios given in percent								
		Q	F	SRF	M	All heavies		Nonopaque heavies						
						O	NO	Z	T	G	S	R	A	E
2	L-657	97	0	3	0	37.6	62.4	87.1	11.9	0	0	1.0	0	0
	658	98	0	2	0	41.5	58.5	68.7	21.8	0	0	9.5	0	0
	659	92	0	8	0	69.4	30.6	79.8	17.0	0	0	3.2	0	0
		(96)	(0)	(4)	(0)	(49.5)	(50.5)	(78.5)	(16.9)	(0)	(0)	(4.6)	(0)	(0)
3	L-608	94	2	4	0	47.3	52.7	70.9	29.1	0	0	0	0	0
	609	92	6	2	0	42.0	58.0	65.5	33.3	0	0	1.2	0	0
	610	91	7	2	0	39.7	60.3	70.2	28.7	0	0	1.1	0	0
		(92)	(5)	(3)	(0)	(43.0)	(57.0)	(68.8)	(30.4)	(0)	(0)	(0.8)	(0)	(0)
7	L-358	88	7	5	0	43.7	56.3	57.9	23.9	16.4	0.6	1.2	0	0
	359	87	12	1	0	25.1	74.9	67.1	15.1	13.7	0	4.1	0	0
	360	81	12	7	0	74.0	26.0	48.2	34.8	14.3	0	2.7	0	0
		(86)	(10)	(4)	(0)	(47.6)	(52.7)	(24.6)	(14.8)	(14.8)	(0.2)	(2.7)	(0)	(0)
8	L-368	96	0	4	0	30.7	69.3	70.7	24.5	0.5	0	4.3	0	0
	L-345	70	15	15	0	39.8	60.2	71.5	19.5	5.0	2.0	2.0	0	0
	346	84	14	2	0	34.7	65.3	74.9	8.7	11.1	2.9	2.4	0	0
	347	81	15	4	0	44.2	55.8	57.0	18.6	21.5	2.3	0.6	0	0
		(78)	(15)	(7)	(0)	(39.6)	(60.4)	(67.8)	(15.6)	(12.5)	(2.4)	(1.7)	(0)	(0)
19	L-332	93	1	6	0	81.0	19.0	37.0	58.0	1.0	0	4.0	0	0
	333	84	15	1	0	30.6	69.4	60.4	24.7	6.5	0	8.4	0	0
		(89)	(8)	(4)	(0)	(55.8)	(44.2)	(48.7)	(41.3)	(3.8)	(0)	(6.2)	(0)	(0)
	L-482	80	12	8	0	30.0	70.0	43.4	25.2	29.0	0	2.4	0	0
24	483	78	3	19	0	26.0	74.0	57.6	14.0	26.6	0	1.8	0	0
	484	76	22	1	1	53.3	46.7	54.3	17.3	17.1	2.1	4.3	2.9	0
		(78)	(13)	(9)	(0)	(36.4)	(63.6)	(51.7)	(18.8)	(25.0)	(0.7)	(2.8)	(1.0)	(0)

Table 5.--Mineral ratios obtained in the disaggregated light-grain and heavy-mineral studies of 253 sandstone samples from the Salt Wash Member of the Morrison Formation.--Continued

Map location	Sample No.	Light-grain study				Heavy-mineral study, with ratios given in percent								
		Q	F	SRF	M	All heavies		Nonopaque heavies						
						O	NO	Z	T	G	S	R	A	E
27	L-344	74	23	3	0	24.2	75.8	78.3	14.5	0.4	0	6.4	0.4	0
28	L-393	84	8	8	0	87.1	12.9	54.1	23.0	17.4	4.6	0.9	0	0
	394	89	10	1	0	51.3	48.7	41.1	28.8	24.6	4.1	1.4	0	0
		(86)	(9)	(5)	(0)	(69.2)	(30.8)	(47.6)	(25.9)	(21.0)	(4.3)	(1.2)	(0)	(0)
29	L-816	82	3	15	0	42.1	57.9	56.8	17.6	16.5	6.2	2.3	0	0.6
	817	84	13	3	0	23.0	77.0	73.6	15.2	7.8	0.4	3.0	0	0
	818	87	6	7	0	23.7	76.3	57.2	19.2	16.6	3.1	3.9	0	0
	819	74	23	3	0	20.9	79.1	62.6	20.2	11.3	1.3	4.2	0	0.4
		(82)	(11)	(7)	(0)	(27.4)	(72.6)	(62.5)	(18.1)	(13.0)	(2.8)	(3.4)	(0)	(0.2)
31	L-492	85	9	6	0	52.3	47.7	78.3	18.2	0	3.5	0	0	0
	493	87	7	6	0	35.7	64.3	66.2	28.3	0	1.5	4.0	0	0
	494	96	1	3	0	24.7	75.3	77.9	18.2	0.4	0.4	3.1	0	0
	495	90	6	4	0	49.0	51.0	55.1	41.8	0	0.6	2.5	0	0
		(90)	(6)	(5)	(0)	(40.4)	(59.6)	(69.4)	(26.6)	(0.1)	(1.5)	(2.4)	(0)	(0)
37	L-491	82	13	5	0	58.2	41.8	69.9	22.8	1.5	0.7	4.4	0.7	0
	500	88	9	3	0	71.6	28.4	86.0	10.0	2.0	0	2.0	0	0
	501	92	5	3	0	56.5	43.5	58.8	19.9	11.0	4.4	5.9	0	0
		(87)	(9)	(4)	(0)	(62.1)	(37.9)	(71.6)	(17.6)	(4.8)	(1.7)	(4.1)	(0.2)	(0)
40	L-731	74	25	1	0	55.3	44.7	33.6	38.8	19.4	7.5	0.7	0	0
	732	84	15	1	0	57.7	42.3	32.3	40.1	10.2	15.0	2.4	0	0
	821	91	0	9	0	36.3	63.7	49.2	36.3	11.9	2.1	0.5	0	0
	822	88	8	4	0	42.4	57.6	32.3	37.3	17.8	7.5	5.2	0	0
	823	92	5	3	0	79.2	20.8	57.0	29.0	4.0	6.0	4.0	0	0
	824	74	7	19	0	63.0	37.0	46.9	36.9	10.8	2.7	2.7	0	0
		(84)	(10)	(6)	(0)	(55.6)	(44.4)	(41.9)	(36.4)	(12.4)	(6.8)	(2.5)	(0)	(0)
45	L-808	88	11	1	0	45.3	54.7	46.8	26.6	11.8	12.4	2.4	0	0
	809	89	7	4	0	35.3	64.7	65.8	27.6	0.5	2.0	4.1	0	0
	810	93	1	6	0	29.7	70.3	78.4	8.6	4.8	6.5	1.7	0	0
	811	96	2	2	0	44.7	55.3	60.1	30.3	3.0	3.6	3.0	0	0
		(92)	(5)	(3)	(0)	(38.8)	(61.2)	(62.8)	(23.3)	(5.0)	(6.1)	(2.8)	(0)	(0)



Table 5.--Mineral ratios obtained in the disaggregated light-grain and heavy-mineral studies of 253 sandstone samples from the Salt Wash Member of the Morrison Formation.--Continued

Map location	Sample No.	Light-grain study				Heavy-mineral study, with ratios given in percent								
		Q	F	SRF	M	All heavies		Nonopaque heavies						
						O	NO	Z	T	G	S	R	A	E
56	L- 14	84	13	3	0	44.5	55.5	58.5	33.9	0	0	7.0	0.6	0
	15	88	11	1	0	69.8	30.2	83.0	14.0	1.0	0	2.0	0	0
	16	82	11	1	6	43.9	56.1	82.0	12.6	0.5	0	3.3	1.6	0
	17	88	8	4	0	55.0	45.0	65.7	30.1	0.7	0	3.5	0	0
	18	76	19	5	0	26.1	73.9	89.8	7.1	0.9	0	2.2	0	0
	19	90	6	4	0	35.6	64.4	84.3	7.8	1.0	0	4.4	2.5	0
	20	80	8	11	1	76.5	23.5	79.5	6.8	4.1	0	1.4	8.2	0
		(84)	(11)	( 4)	(1)	(50.2)	(49.8)	(77.5)	(16.0)	(1.2)	(0)	(3.4)	(1.9)	(0)
59	L-628	23	0	77	0	36.4	63.6	52.9	18.5	18.0	6.3	3.2	1.1	0
	629	85	8	7	0	53.4	46.6	36.3	38.2	16.6	6.4	2.5	0	0
	630	77	6	17	0	25.7	74.3	67.7	9.9	17.0	3.6	1.8	0	0
		(62)	(5)	(33)	(0)	(38.5)	(61.5)	(52.3)	(22.2)	(17.2)	(5.4)	(2.5)	(0.4)	(0)
61	L- 50	92	7	1	0	70.3	29.7	67.0	22.0	0	0	5.5	5.5	0
	51	90	5	5	0	67.7	32.3	88.8	5.1	2.0	0	3.1	1.0	0
	52	87	8	5	0	74.0	26.0	72.8	16.5	2.9	0	6.8	1.0	0
	53	84	9	7	0	68.1	31.9	69.0	14.4	5.2	0	5.2	6.2	0
	54	79	13	8	0	76.5	23.5	81.0	16.0	0	0	2.0	1.0	0
		(87)	(8)	(5)	(0)	(71.3)	(28.7)	(75.7)	(15.8)	(1.0)	(0)	(4.5)	(2.9)	(0)
64	L-417	87	10	3	0	79.5	20.5	76.0	12.0	9.0	0	3.0	0	0
	418	83	8	9	0	38.3	61.7	58.4	23.8	15.7	0.5	1.6	0	0
	419	91	4	5	0	34.0	66.0	68.7	18.7	9.6	0	3.0	0	0
	420	86	9	5	0	46.0	54.0	43.8	38.3	10.5	0	7.4	0	0
	422	77	18	5	0	63.5	37.5	28.7	41.8	19.1	4.3	6.1	0	0
		(85)	(10)	(5)	(0)	(52.1)	(47.9)	(55.1)	(26.9)	(12.8)	(1.0)	(4.2)	(0)	(0)
72	L-405	90	2	8	0	73.3	26.7	72.0	21.0	0	2.0	5.0	0	0
	406	90	3	7	0	62.7	37.3	69.6	20.5	1.8	6.3	1.8	0	0
	407	90	9	1	0	55.5	44.5	69.6	25.4	0	0	5.0	0	0
		(90)	(5)	(5)	(0)	(63.8)	(36.2)	(70.4)	(22.3)	(0.6)	(2.8)	(3.9)	(0)	(0)

Table 5.--Mineral ratios obtained in the disaggregated light-grain and heavy-mineral studies of 253 sandstone samples from the Salt Wash Member of the Morrison Formation.--Continued

Map location	Sample No.	Light-grain study				Heavy-mineral study, with ratios given in percent								
		Q	F	SRF	M	All heavies		Nonopaque heavies						
						O	NO	Z	T	G	S	R	A	E
73	L-812	78	8	14	0	37.2	62.8	38.2	27.7	26.7	3.2	3.2	0.5	0.5
	813	87	10	3	0	32.5	67.5	73.0	18.6	4.9	0.5	2.5	0	0.5
	814	83	8	9	0	40.8	59.2	56.8	24.6	15.8	1.7	1.1	0	0
		(82)	(9)	(9)	(0)	(36.8)	(63.2)	(56.0)	(23.6)	(15.8)	(1.8)	(2.3)	(0.2)	(0.3)
75	L-804	90	6	4	0	44.7	55.3	65.1	19.9	4.8	6.6	3.6	0	0
	805	94	4	2	0	60.3	39.7	62.2	24.4	8.4	1.7	2.5	0	0.8
	806	85	13	2	0	52.3	47.7	56.6	26.6	6.3	0.7	4.9	4.9	0
	807	82	7	11	0	36.7	63.3	52.9	15.0	22.8	2.6	6.7	0	0
		(88)	(7)	(5)	(0)	(48.5)	(51.5)	(59.2)	(21.5)	(10.6)	(2.9)	(4.4)	(1.2)	(0.2)
81	L-834	75	10	15	0	25.7	74.3	61.0	7.2	24.6	3.6	3.6	0	0
	835	77	13	10	0	58.3	41.7	36.8	38.4	11.2	8.0	5.6	0	0
	836	82	11	7	0	65.3	34.7	55.8	18.3	14.4	9.6	1.9	0	0
		(78)	(11)	(11)	(0)	(49.8)	(50.2)	(51.2)	(21.3)	(16.7)	(7.1)	(3.7)	(0)	(0)
86	L-631	81	11	8	0	43.5	56.5	54.8	22.1	15.1	4.8	3.2	0	0
	632	80	13	7	0	55.0	45.0	57.7	25.2	10.4	4.5	2.2	0	0
	633	82	1	17	0	59.8	40.2	59.4	13.8	16.3	8.9	1.6	0	0
	637	81	10	9	0	43.7	56.3	40.2	42.5	6.9	5.2	5.2	0	0
		(81)	(9)	(10)	(0)	(50.5)	(49.5)	(53.0)	(25.9)	(12.2)	(5.9)	(3.0)	(0)	(0)
88	L-845	84	12	4	0	66.0	34.0	46.1	21.6	12.7	11.8	7.8	0	0
	846	84	4	12	0	42.6	57.4	43.0	32.4	13.4	9.5	1.7	0	0
	847	66	18	16	0	56.9	43.1	55.7	15.3	17.6	5.3	6.1	0	0
	848	80	6	14	0	32.4	67.6	57.8	11.6	20.4	8.3	1.9	0	0
	849	75	17	8	0	33.0	67.0	69.2	10.9	12.9	2.0	5.0	0	0
		(78)	(11)	(11)	(0)	(46.2)	(53.8)	(54.4)	(18.3)	(15.4)	(7.4)	(4.5)	(0)	(0)
90	L-488	89	7	4	0	62.7	37.3	55.9	16.9	22.9	1.7	2.6	0	0
	489	83	13	4	0	42.8	57.2	63.8	23.0	8.6	1.1	3.5	0	0
	490	92	4	4	0	58.7	41.3	68.2	6.2	17.8	6.2	1.6	0	0
		(88)	(8)	(4)	(0)	(54.7)	(45.3)	(62.6)	(15.4)	(16.4)	(3.0)	(2.6)	(0)	(0)



Table 5.--Mineral ratios obtained in the disaggregated light-grain and heavy-mineral studies of 253 sandstone samples from the Salt Wash Member of the Morrison Formation.--Continued

Map location	Sample No.	Light-grain study			Heavy-mineral study with ratios given in percent									
		Q	F	SRF	All heavies			Nonopaque heavies						
					M	O	NO	Z	T	G	S	R	A	E
93	L- 31	90	7	3	0	74.0	26.0	78.5	8.8	2.9	0	1.0	8.8	0
	32	87	10	3	0	72.9	27.1	39.2	45.1	1.0	0	4.9	9.8	0
	33	91	8	1	0	74.8	25.2	66.4	23.8	4.9	0	4.9	0	0
		(89)	( 9)	( 2)	(0)	(73.9)	(26.1)	(61.4)	(25.9)	( 2.9)	(0)	(3.6)	(6.2)	(0)
99	L-353	95	2	3	0	79.0	21.0	73.0	23.0	0	0	4.0	0	0
	354	95	4	1	0	76.0	24.0	70.2	26.9	1.0	0	1.9	0	0
	355	94	2	4	0	41.9	58.1	78.0	16.0	0	0	6.0	0	0
	356	89	5	6	0	64.6	35.4	75.2	13.3	8.8	0	2.7	0	0
	357	88	2	10	0	81.5	18.5	75.0	17.0	7.0	0	1.0	0	0
	366	90	3	7	0	68.2	31.8	82.0	9.0	0	0	2.0	7.0	0
		(92)	( 3)	( 5)	(0)	(68.5)	(31.5)	(75.6)	(17.5)	( 2.8)	(0)	(2.9)	(1.2)	(0)
105	L- 34	85	11	4	0	80.0	20.0	74.0	26.0	0	0	0	0	0
	35	80	10	10	0	72.1	27.9	92.3	6.7	0	0	1.0	0	0
	36	86	10	4	0	59.3	40.7	83.9	12.9	0	0	3.2	0	0
	37	80	14	6	0	70.8	29.2	89.0	6.0	1.0	0	3.0	1.0	0
	38	78	13	9	0	59.2	40.8	83.7	10.9	0	0	5.4	0	0
	39	80	12	8	0	48.4	51.6	92.4	3.2	0	0	4.4	0	0
	40	79	17	4	0	72.8	27.2	88.0	4.0	0	0	8.0	0	0
		(81)	(13)	( 6)	(0)	(66.1)	(33.9)	(86.2)	(10.0)	( 0.1)	( 0)	(3.6)	(0.1)	(0)
107	L-636	14	0	86	0	36.1	63.9	62.1	18.2	10.1	3.5	6.1	0	0
	843	35	5	60	0	49.7	50.3	63.0	11.1	14.2	7.4	4.3	0	0
	844	38	1	61	0	53.9	46.1	54.9	7.1	23.2	11.6	3.2	0	0
		(29)	( 2)	(69)	(0)	(46.6)	(53.4)	(60.0)	(12.1)	(15.9)	( 7.5)	(4.5)	(0)	(0)
112	L-502	83	5	12	0	56.2	43.8	76.6	8.0	13.9	0	1.5	0	0
	503	88	5	7	0	24.3	75.7	67.1	12.8	18.4	0	1.3	0	0.4
	504	91	5	4	0	28.8	71.2	72.4	10.1	14.0	0	3.5	0	0
		(87)	( 5)	( 8)	(0)	(36.4)	(63.6)	(72.1)	(10.3)	(15.4)	( 0)	(2.1)	(0)	(0.1)

Table 5.--Mineral ratios obtained in the disaggregated light-grain and heavy-mineral studies of 253 sandstone samples from the Salt Wash Member of the Morrison Formation.--Continued

Map location	Sample No.	Light-grain study				Heavy-mineral study, with ratios given in percent								
		Q	F	SRF	M	All heavies		Nonopaque heavies						
						O	NO	Z	T	G	S	R	A	E
115	L-341	88	5	7	0	39.0	61.0	60.4	27.6	6.8	0	5.2	0	0
	342	92	1	7	0	66.9	33.1	56.9	29.4	7.3	0	6.4	0	0
		(90)	(3)	(7)	(0)	(53.0)	(47.0)	(58.7)	(28.5)	(7.0)	(0)	(5.8)	(0)	(0)
121	L-605	91	8	1	0	40.4	59.6	63.2	34.7	0	0	2.1	0	0
	606	94	2	3	1	33.0	67.0	76.4	19.7	0.5	0	3.4	0	0
	607	98	1	1	0	47.1	52.9	79.8	18.4	0	0	1.8	0	0
		(94)	(4)	(2)	(0)	(40.2)	(59.8)	(73.1)	(24.3)	(0.2)	(0)	(2.4)	(0)	(0)
124	L-190	90	7	3	0	88.8	11.2	70.0	26.0	2.0	0	2.0	0	0
	191	91	8	1	0	84.1	15.9	65.0	25.0	5.0	5.0	0	0	0
		(90)	(8)	(2)	(0)	(86.5)	(13.5)	(67.5)	(25.5)	(3.5)	(2.5)	(1.0)	(0)	(0)
125	L-557	82	10	8	0	90.0	10.0	40.0	50.0	0	0	6.0	4.0	0
	558	95	4	1	0	66.7	33.3	71.0	25.0	0	0	0	4.0	0
	559	88	11	1	0	78.4	21.6	16.0	80.0	0	0	2.0	2.0	0
		(89)	(8)	(3)	(0)	(78.4)	(21.6)	(42.3)	(51.7)	(0)	(0)	(2.7)	(3.3)	(0)
130	L-485	84	13	3	0	80.3	19.7	35.0	58.0	2.0	0	5.0	0	0
	486	91	1	8	0	81.1	18.9	67.3	16.4	11.8	0	2.7	1.8	0
	487	91	0	9	0	77.4	22.6	59.2	31.5	6.5	0	2.8	0	0
		(88)	(5)	(7)	(0)	(79.6)	(20.4)	(53.8)	(35.3)	(6.8)	(0)	(3.5)	(0.6)	(0)
133	L-379	88	3	9	0	31.7	68.3	77.0	12.1	8.0	0	2.9	0	0
135	L-321	82	11	7	0	77.9	22.1	37.0	32.0	28.0	1.0	2.0	0	0
136-A	L-95	81	7	12	0	27.4	72.6	88.8	5.2	3.0	0.4	2.6	0	0
	98	80	5	15	0	48.6	51.4	49.4	40.6	6.3	0	3.7	0	0
	106	96	1	3	0	43.6	56.4	95.6	1.1	1.7	0.5	1.1	0	0
		(92)	(4)	(10)	(0)	(39.9)	(60.1)	(77.9)	(15.6)	(3.7)	(0.3)	(2.5)	(0)	(0)
136-B	L-334	86	11	3	0	76.0	24.0	72.0	21.0	6.0	0	1.0	0	0
	335	84	12	4	0	62.6	37.4	46.6	40.5	1.7	0	11.2	0	0
	336	92	4	4	0	78.2	21.8	75.5	17.6	1.0	0	6.9	0	0
	337	88	6	6	0	80.2	19.8	61.0	26.6	1.0	0	11.4	0	0
		(88)	(8)	(4)	(0)	(76.2)	(25.8)	(63.7)	(26.3)	(2.4)	(0)	(7.6)	(0)	(0)



Table 5. --Mineral ratios obtained in the disaggregated light-grain and heavy-mineral studies of 253 sandstone samples from the Salt Wash Member of the Morrison Formation. --Continued

Map location	Sample No.	Light-grain study				Heavy-mineral study, with ratios given in percent								
		Q	F	SRF	M	All heavies		Nonopaque heavies						
						O	°NO	Z	T	G	S	R	A	E
138	L-343	84	13	3	0	32.3	67.7	64.5	27.6	0	0.5	7.4	0	0
142	L-331	84	11	5	0	37.6	62.4	33.8	44.9	8.3	4.2	2.8	6.0	0
	388	97	1	2	0	41.8	58.2	77.0	15.7	2.6	4.7	0	0	0
	389	97	2	1	0	56.3	43.7	71.2	16.0	0	1.9	4.5	6.4	0
	390	90	7	3	0	56.1	43.9	62.1	30.0	4.3	0	3.6	0	0
		(92)	(5)	(3)	(0)	(48.0)	(52.0)	(61.0)	(26.7)	(3.8)	(2.7)	(2.7)	(3.1)	(0)
146	L-625	85	9	6	0	49.5	50.5	9.9	69.2	16.0	0	4.3	0.6	0
	626	84	4	12	0	40.1	59.9	36.3	29.7	26.9	0.5	6.6	0	0
	627	53	3	44	0	37.3	62.7	21.3	37.7	36.2	0	4.8	0	0
		(74)	(5)	(21)	(0)	(42.3)	(57.7)	(22.5)	(45.5)	(26.4)	(0.2)	(5.2)	(0.2)	(0)
148	L-825	89	7	4	0	53.7	46.3	68.4	21.6	0.7	3.6	5.0	0.7	0
	826	93	5	2	0	38.7	61.3	71.7	24.5	0	2.2	1.6	0	0
	827	95	4	1	0	52.7	47.3	54.2	40.9	0	4.9	0	0	0
	828	90	4	6	0	51.0	49.0	74.8	14.3	1.4	5.4	3.4	0	0.7
	829	92	6	2	0	51.0	49.0	82.4	12.2	0	2.7	2.7	0	0
	830	91	6	3	0	47.7	52.3	40.8	52.3	1.9	2.5	2.5	0	0
		(92)	(5)	(3)	(0)	(49.1)	(50.9)	(65.4)	(27.6)	(0.7)	(3.6)	(2.5)	(0.1)	(0.1)
150	L-45	88	2	10	0	64.0	36.0	68.5	20.7	5.4	0	5.4	0	0
	46	91	3	6	0	70.2	29.8	60.9	22.5	4.9	7.8	3.9	0	0
	47	83	6	11	0	86.2	13.8	62.8	30.2	4.7	0	2.3	0	0
		(87)	(4)	(9)	(0)	(73.5)	(26.5)	(64.1)	(24.5)	(5.0)	(2.6)	(3.8)	(0)	(0)
151	L-377	75	23	2	0	76.2	23.8	51.0	30.0	15.0	0	4.0	0	0
	378	75	22	3	0	83.6	16.4	44.0	31.0	21.0	0	4.0	0	0
		(75)	(23)	(2)	(0)	(79.9)	(20.1)	(47.5)	(30.5)	(18.0)	(0)	(4.0)	(0)	(0)
159	L-736	90	5	5	0	33.1	66.9	72.8	14.4	5.4	5.4	2.0	0	0
	737	87	10	3	0	40.7	59.3	46.1	26.9	16.8	9.6	0.6	0	0
	850	81	13	6	0	50.3	49.7	53.0	17.7	15.0	6.5	7.8	0	0
		(86)	(9)	(5)	(0)	(41.4)	(58.6)	(57.3)	(19.7)	(12.4)	(7.2)	(3.5)	(0)	(0)

Table 5. --Mineral ratios obtained in the disaggregated light-grain and heavy-mineral studies of 253 sandstone samples from the Salt Wash Member of the Morrison Formation. --Continued

Map location	Sample No.	Light-grain study				Heavy-mineral study, with ratios given in percent								
		Q	F	SRF	M	All heavies		Nonopaque heavies						
						O	NO	Z	T	G	S	R	A	E
160	L-508	98	0	2	0	74.9	25.1	75.0	22.0	0	0	3.0	0	0
	509	90	6	4	0	82.3	17.7	76.0	20.0	0	0	4.0	0	0
	510	88	1	11	0	30.9	69.1	87.0	11.6	0	0	1.4	0	0
	511	90	5	5	0	33.7	66.3	86.9	11.1	0	0	2.0	0	0
		(91)	(3)	(6)	(0)	(55.5)	(44.5)	(81.2)	(16.2)	(0)	(0)	(2.6)	(0)	(0)
161	L-496	83	10	7	0	31.4	68.6	75.9	16.2	5.1	1.9	0.9	0	0
	497	93	6	1	0	81.8	18.2	45.5	37.6	14.9	0	1.0	1.0	0
	498	82	11	7	0	77.1	22.9	58.0	25.0	11.0	1.0	5.0	0	0
	499	75	1	24	0	93.3	6.7	35.0	27.5	30.0	7.5	0	0	0
		(83)	(7)	(10)	(0)	(70.9)	(29.1)	(53.6)	(26.6)	(15.3)	(2.6)	(1.7)	(0.2)	(0)
162	L-300	87	12	1	0	52.9	47.1	32.4	44.9	17.9	0	4.1	0.7	0
	301	90	9	1	0	54.3	45.7	55.4	23.0	18.0	0	3.6	0	0
	302	88	9	3	0	59.7	40.3	54.4	18.4	23.2	0	4.0	0	0
		(88)	(10)	(2)	(0)	(55.6)	(44.4)	(47.4)	(28.8)	(19.7)	(0)	(3.9)	(0.2)	(0)
163	L-312	94	4	2	0	74.7	25.3	56.0	22.0	18.0	0	4.0	0	0
	319	88	4	8	0	21.9	78.1	62.1	17.0	16.6	0.9	3.4	0	0
		(91)	(4)	(5)	(0)	(48.3)	(51.7)	(59.0)	(19.5)	(17.3)	(0.5)	(3.7)	(0)	(0)
165	L-330	98	0	2	0	40.3	59.7	48.0	48.0	0.6	0	2.8	0.6	0
171	L-339	80	13	7	0	70.8	29.2	52.9	32.4	8.8	3.9	2.0	0	0
173	L-505	92	1	7	0	23.5	76.5	69.3	22.4	0	3.3	5.0	0	0
	506	94	0	6	0	80.7	19.3	81.0	10.0	5.0	3.0	1.0	0	0
		(93)	(1)	(6)	(0)	(52.1)	(47.9)	(75.1)	(16.2)	(2.5)	(3.2)	(3.0)	(0)	(0)
174	L-215	91	6	3	0	78.3	21.7	35.8	51.9	6.2	1.2	4.9	0	0
	216	90	8	2	0	65.1	34.9	11.1	54.7	4.3	0	2.6	27.3	0
	217	91	2	7	0	44.6	55.4	50.5	34.8	13.6	0	0	1.1	0
	218	83	15	2	0	77.8	22.2	34.0	51.0	10.0	2.0	2.0	1.0	0
	219	85	12	3	0	76.7	23.3	36.0	32.0	20.0	2.0	10.0	0	0
	220	89	10	1	0	46.7	53.3	54.7	25.3	11.2	0	8.8	0	0
	221	88	6	6	0	76.5	23.5	63.0	18.5	16.7	0	1.8	0	0
	222	86	9	5	0	41.8	58.2	43.4	42.9	8.8	0	4.9	0	0
	223	84	5	11	0	26.3	73.7	52.5	26.7	14.9	0.5	2.7	2.7	0
		(88)	(8)	(4)	(0)	(59.3)	(40.7)	(42.3)	(37.5)	(11.8)	(0.6)	(4.2)	(3.6)	(0)



Table 5.--Mineral ratios obtained in the disaggregated light-grain and heavy-mineral studies of 253 sandstone samples from the Salt Wash Member of the Morrison Formation.--Continued

Map location	Sample No.	Light-grain study				Heavy-mineral study, with ratios given in percent								
		Q	F	SRF	M	All heavies		Nonopaque heavies						
						O	NO	Z	T	G	S	R	A	E
175	L-743	81	16	3	0	74.7	25.3	8.0	81.0	9.0	1.0	1.0	0	0
	744	84	11	5	0	63.7	31.3	20.0	47.0	24.0	1.0	3.0	0	0
		(82)	(14)	(4)	(0)	(71.7)	(28.3)	(14.0)	(64.0)	(16.5)	(1.0)	(2.0)	(0)	(2.5)
177	L-349	96	0	4	0	27.0	73.0	74.6	20.5	0	0	4.9	0	0
	350	97	0	3	0	38.8	61.2	77.2	18.0	0	0	4.8	0	0
	351	98	0	2	0	80.6	19.4	73.0	19.0	0	0	8.0	0	0
		(97)	(0)	(3)	(0)	(48.8)	(51.2)	(74.9)	(19.2)	(0)	(0)	(5.9)	(0)	(0)
178	L-158	80	8	12	0	21.0	79.0	69.7	7.6	14.3	0.8	7.6	0	0
	159	89	8	3	0	14.7	85.3	63.3	9.0	24.6	0.4	2.7	0	0
	160	81	10	9	0	42.9	57.1	66.9	18.0	11.6	0	3.5	0	0
	227	94	2	4	0	38.4	61.6	65.1	24.5	6.6	0	3.8	0	0
	228	85	12	3	0	70.6	29.4	57.3	13.5	4.2	0	25.0	0	0
	229	82	11	7	0	57.7	42.3	29.2	34.6	22.0	2.4	11.0	0.8	0
	231	88	8	4	0	35.2	64.8	34.9	36.3	22.2	0.9	5.7	0	0
		(86)	(8)	(6)	(0)	(40.1)	(59.9)	(55.2)	(20.5)	(15.1)	(0.6)	(8.5)	(0.1)	(0)
179	L-329	94	1	5	0	48.6	51.4	58.9	38.4	0	0	2.7	0	0
	331	99	0	1	0	40.5	59.5	44.0	56.0	0	0	0	0	0
	333	83	9	8	0	61.8	38.2	75.4	15.3	3.4	0	5.9	0	0
	334	88	5	7	0	21.7	78.3	82.1	13.6	0.9	0.9	2.5	0	0
		(91)	(4)	(5)	(0)	(43.1)	(56.9)	(65.1)	(30.8)	(1.1)	(0.2)	(2.8)	(0)	(0)
181	L-615	83	3	14	0	93.5	6.5	55.6	16.7	8.3	11.1	2.8	5.5	0
	616	85	11	4	0	40.6	59.4	54.3	37.5	2.2	2.7	3.3	0	0
	617	91	1	8	0	44.8	55.2	45.8	48.1	0	1.7	4.4	0	0
		(86)	(5)	(9)	(0)	(59.6)	(40.4)	(51.9)	(34.1)	(3.5)	(5.2)	(3.5)	(1.8)	(0)
182	L- 1	79	9	7	5	78.2	21.8	83.0	3.0	0	0	5.0	4.0	0
	2	87	11	1	1	77.2	22.8	36.6	60.6	1.4	0	1.4	0	0
	576	79	20	1	0	52.3	47.7	75.7	19.2	0	0	5.1	0	0
	582	79	18	3	0	84.3	15.7	22.9	64.6	0	0	10.4	2.1	0
	588	85	13	2	0	81.9	18.1	64.0	31.0	0	0	5.0	0	0
		(82)	(14)	(3)	(1)	(74.8)	(25.2)	(57.4)	(35.7)	(0.3)	(0)	(5.4)	(1.2)	(0)
184	L- 41	96	0	4	0	55.8	44.2	70.5	21.8	7.0	0	0.7	0	0
	43	95	0	5	0	56.0	44.0	67.4	22.2	8.9	0	1.5	0	0
		(95)	(0)	(5)	(0)	(55.9)	(44.1)	(69.0)	(22.0)	(7.9)	(0)	(1.1)	(0)	(0)

Table 5.--Mineral ratios obtained in the disaggregated light-grain and heavy-mineral studies of 253 sandstone samples from the Salt Wash Member of the Morrison Formation.--Continued

Map location	Sample No.	Light-grain study				Heavy-mineral study, with ratios given in percent								
		Q	F	SRF	M	All heavies		Nonopaque heavies						
						O	NO	Z	T	G	S	R	A	E
189	L-611	44	7	49	0	33.5	66.5	51.4	17.8	24.6	3.8	2.4	0	0
	612	81	3	16	0	41.1	58.9	61.5	18.3	10.4	8.3	1.0	0.5	0
	613	61	9	30	0	69.8	30.2	40.6	34.1	14.3	11.0	0	0	0
	614	13	1	86	0	84.1	15.9	52.0	38.0	6.0	2.0	2.0	0	0
	620	84	11	5	0	35.5	64.5	41.3	42.3	7.7	5.6	3.1	0	0
		(57)	(6)	(37)	(0)	(52.8)	(47.2)	(49.4)	(30.1)	(12.6)	(6.1)	(1.7)	(0.1)	(0)
194	L-340	86	10	4	0	76.1	23.9	74.5	12.7	8.8	0	3.9	0	0
197	L-799	95	4	1	0	78.8	21.2	86.7	7.1	3.1	0	3.1	0	0
	800	95	4	1	0	30.6	69.4	81.8	12.0	1.4	0	4.8	0	0
	801	96	4	0	0	84.8	15.2	88.0	5.0	5.0	0	2.0	0	0
		(95)	(4)	(1)	(0)	(64.7)	(35.3)	(85.5)	(8.0)	(3.2)	(0)	(3.3)	(0)	(0)
199	L-621	92	4	4	0	28.0	72.0	52.8	25.0	20.8	0	1.4	0	0
	622	86	3	11	0	15.6	84.4	56.7	12.2	30.3	0	0.8	0	0
	623	90	3	7	0	11.3	88.7	76.3	6.0	17.3	0	0.4	0	0
	624	80	0	20	0	66.0	34.0	24.5	30.4	33.3	0	3.9	7.9	0
		(87)	(3)	(10)	(0)	(30.2)	(69.8)	(52.6)	(18.4)	(25.4)	(0)	(1.6)	(2.0)	(0)
200	L- 55	93	5	2	0	78.2	21.8	72.4	9.6	0	0	8.4	9.6	0
	56	96	3	1	0	85.4	14.6	82.0	14.7	0	0	3.3	0	0
	57	86	9	5	0	35.9	64.1	89.6	4.4	0	0	3.5	2.5	0
	58	90	8	2	0	74.4	25.6	94.0	1.0	0	0	5.0	0	0
	59	94	5	1	0	27.2	72.8	92.8	3.8	0	0	3.4	0	0
	60	90	5	5	0	80.8	19.2	91.8	5.5	0	0	2.7	0	0
		(91)	(6)	(3)	(0)	(63.7)	(36.3)	(87.1)	(6.5)	(0)	(0)	(4.4)	(2.0)	(0)
201	L- 21	93	5	2	0	74.6	25.4	24.2	35.7	1.7	0	4.2	34.2	0
	22	83	13	4	0	73.4	26.6	61.4	33.7	0	0	4.9	0	0
	23	99	0	1	0	52.7	47.3	73.1	23.7	0.6	0	2.6	0	0
		(92)	(6)	(2)	(0)	(66.9)	(33.1)	(52.9)	(31.0)	(0.8)	(0)	(3.9)	(11.4)	(0)
203	L- 24	84	4	12	0	43.1	56.9	30.9	45.9	15.5	0	7.7	0	0
	25	82	8	10	0	42.5	57.5	74.6	13.3	2.3	0	9.8	0	0
	26	80	9	11	0	58.9	41.1	73.6	15.5	6.2	0	4.7	0	0
	27	80	10	10	0	60.5	39.5	80.6	4.0	8.9	0	6.5	0	0
	28	83	9	8	0	30.6	69.4	80.8	9.9	4.8	0	4.5	0	0
		(82)	(8)	(10)	(0)	(47.1)	(52.9)	(68.1)	(17.7)	(7.5)	(0)	(6.7)	(0)	(0)

Table 5.--Mineral ratios obtained in the disaggregated light-grain and heavy-mineral studies of 253 sandstone samples from the Salt Wash Member of the Morrison Formation.--Continued

Map location	Sample No.	Light-grain study				Heavy-mineral study, with ratios given in percent								
		Q	F	SRF	M	All heavies		Nonopaque heavies						
						O	NO	Z	T	G	S	R	A	E
208	L-400	87	10	3	0	22.6	77.4	63.5	11.2	21.0	0	4.3	0	0
	401	88	3	9	0	24.1	75.9	52.5	25.2	20.7	0	1.6	0	0
	402	82	2	16	0	27.6	72.4	48.6	24.5	25.5	0	1.4	0	0
		(86)	(5)	(9)	(0)	(24.8)	(75.2)	(54.9)	(20.3)	(22.4)	(0)	(2.4)	(0)	(0)
214	L-239	87	12	1	0	57.2	42.8	85.3	13.2	0	0	1.5	0	0
	240	84	15	1	0	84.5	15.5	75.9	16.5	3.8	0	3.8	0	0
	286	95	4	1	0	79.3	20.7	72.8	22.3	1.0	2.9	1.0	0	0
		(89)	(10)	(1)	(0)	(75.7)	(26.3)	(78.0)	(17.3)	(1.6)	(1.0)	(2.1)	(0)	(0)
215	L-398	93	3	4	0	32.9	67.1	75.5	12.3	9.8	0	2.4	0	0
	399	92	6	2	0	76.7	23.3	74.0	13.0	7.0	0	6.0	0	0
	634	90	1	9	0	72.8	27.2	74.0	11.0	9.0	0	6.0	0	0
	635	87	6	7	0	77.5	22.5	55.0	37.0	4.0	0	4.0	0	0
222		(91)	(4)	(5)	(0)	(65.0)	(35.0)	(69.6)	(18.3)	(7.5)	(0)	(4.6)	(0)	(0)
	L-331	91	2	7	0	32.7	67.3	63.9	25.2	8.4	0.5	2.0	0	0
	832	90	6	4	0	41.1	58.9	63.1	28.4	6.3	1.1	1.1	0	0
	833	88	10	2	0	38.3	61.7	78.9	10.3	5.9	0	4.9	0	0
231		(90)	(6)	(4)	(0)	(37.4)	(62.6)	(68.6)	(21.3)	(6.9)	(0.5)	(2.7)	(0)	(0)
	L-233	90	5	5	0	25.7	74.3	63.3	14.8	15.6	0	6.3	0	0
	234	94	3	3	0	49.7	50.3	74.5	13.7	8.5	0	3.3	0	0
	235	84	9	7	0	38.0	62.0	75.3	11.3	9.1	0	4.3	0	0
	268	88	4	8	0	21.3	78.7	69.2	8.3	18.3	1.3	2.9	0	0
	269	82	4	14	0	84.1	15.9	21.0	20.0	48.0	5.0	5.0	3	
	270	86	0	14	0	57.4	42.6	65.3	13.0	18.1	0	3.6	0	0
	272	96	2	2	0	64.0	36.0	76.9	12.0	8.5	0.9	1.7	0	0
	275	91	8	1	0	53.0	47.0	51.9	33.3	11.3	0	3.5	0	0
		(89)	(4)	(7)	(0)	(49.2)	(50.8)	(62.1)	(15.8)	(17.2)	(0.9)	(3.6)	(0.4)	(0)
Salt Wash Means		85.5	7.2	7.3	0.05	53.6	46.3	62.0	23.2	8.5	1.7	3.6	0.8	0

BASIC ANALYTICAL DATA SUMMARIZED  
IN U.S. GEOLOGICAL SURVEY  
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Table 6.--Mineral ratios obtained in the disaggregated light-grain and heavy-mineral studies of 59 sandstone samples from the Recapture Member of the Morrison Formation

[Map location refers to sample locality number on plate 1 of Professional Paper 556 . Q, quartz; F, potassic and sodic feldspar; SRF, silicified-rock fragments including tuff; M, miscellaneous; O, opaques; NO, nonopaques; Z, zircon; T, tourmaline; G, garnet; S, staurolite; R, rutile; A, apatite; E, epidote. Values in parentheses are location averages (means)]

Map location	Sample No.	Light-grain study				Heavy-mineral study with ratios given in percent								
		Q	F	SRF	M	All heavies		Nonopaque heavies						
						O	NO	Z	T	G	S	R	A	E
7	L-565	88	8	4	0	80.5	19.5	58.0	16.0	26.0	0	0	0	0
	570	81	12	7	0	81.4	18.6	47.0	17.0	36.0	0	0	0	0
		(85)	(10)	(5)	(0)	(81.0)	(19.0)	(52.5)	(16.5)	(31.0)	(0)	(0)	(0)	(0)
28	L-392	85	7	8	0	44.7	55.3	52.6	11.7	29.6	5.0	1.1	0	0
49	L-837	56	44	0	0	66.0	34.0	47.1	7.9	18.6	2.9	2.9	0	20.6
	838	74	24	2	0	87.2	12.8	44.0	25.0	27.0	2.0	2.0	0	0
	839	78	20	1	1	91.8	8.2	48.0	7.0	36.0	8.0	0	0	1.0
		(69)	(29)	(1)	(1)	(81.7)	(18.3)	(46.4)	(13.3)	(27.2)	(4.3)	(1.6)	(0)	(7.2)
78	L-650	79	13	8	0	59.3	40.7	44.3	24.6	27.0	.8	3.3	0	0
	651	79	14	7	0	66.3	33.7	28.4	38.3	12.3	19.8	1.2	0	0
	652	74	20	6	0	79.8	20.2	47.0	29.0	23.0	0	1.0	0	0
		(77)	(16)	(7)	(0)	(68.5)	(31.5)	(39.9)	(30.6)	(20.8)	(6.9)	(1.8)	(0)	(0)
79	L-767	92	8	0	0	75.7	24.3	57.0	17.0	21.0	3.0	2.0	0	0
	768	89	10	1	0	59.3	40.7	59.2	14.3	18.6	3.6	4.3	0	0
	769	96	3	1	0	74.7	25.3	38.0	19.0	27.0	14.0	2.0	0	0
	770	80	19	1	0	82.6	17.4	60.0	10.0	23.0	3.0	4.0	0	0
		(89)	(10)	(1)	(0)	(73.1)	(26.9)	(53.5)	(15.1)	(22.4)	(5.9)	(3.1)	(0)	(0)
83	L-787	65	34	1	0	82.9	17.1	49.0	20.0	26.0	0	3.0	0	2.0
	788	75	25	0	0	82.9	17.1	54.0	13.0	25.0	3.0	1.0	0	4.0
	789	77	23	0	0	82.4	17.6	54.0	10.0	19.0	3.0	1.0	0	13.0
		(73)	(27)	(0)	(0)	(82.7)	(17.3)	(52.3)	(14.3)	(23.4)	(2.0)	(1.7)	(0)	(6.3)
92	L-781	90	6	4	0	52.4	47.6	69.2	11.0	8.2	7.5	4.1	0	0
	782	90	9	1	0	41.4	58.6	72.5	5.1	14.0	7.3	1.1	0	0
	783	72	24	4	0	45.4	54.6	55.7	14.4	23.9	3.6	2.4	0	0
		(84)	(13)	(3)	(0)	(46.4)	(53.6)	(65.8)	(10.2)	(15.4)	(6.1)	(2.5)	(0)	(0)

Table 6.--Mineral ratios obtained in the disaggregated light-grain and heavy-mineral studies of 59 sandstone samples from the Recapture Member of the Morrison Formation--Continued

Map location	Sample No.	Light-grain study				Heavy-mineral study with ratios given in percent								
		Q	F	SRF	M	All heavies		Nonopaque heavies						
						O	NO	Z	T	G	S	R	A	E
114	L-707	76	22	2	0	63.7	36.3	50.5	31.2	7.3	7.3	3.7	0	0
	708	95	2	3	0	58.7	41.3	47.6	27.4	16.9	5.7	1.6	.8	0
	709	65	32	3	0	63.0	37.0	37.9	28.8	24.3	6.3	1.8	.9	0
	710	80	19	1	0	85.4	14.6	50.0	28.0	18.0	4.0	0	0	0
		(79)	(19)	(2)	(0)	(67.7)	(32.3)	(46.5)	(28.9)	(16.6)	(5.8)	(1.8)	(0.4)	(0)
118	L-758	76	22	2	0	63.6	36.4	.8	80.2	11.1	7.1	.8	0	0
	759	84	14	2	0	51.6	48.4	63.3	9.2	19.6	6.1	1.8	0	0
	760	86	13	1	0	60.1	39.9	56.9	13.8	20.8	5.4	3.1	0	0
		(82)	(16)	(2)	(0)	(58.4)	(41.6)	(40.3)	(34.4)	(17.2)	(6.2)	(1.9)	(0)	(0)
124	L-192	83	16	1	0	73.9	26.1	50.0	36.0	9.0	5.0	0	0	0
	193	84	14	2	0	73.2	26.8	64.0	25.0	5.0	2.0	4.0	0	0
	194	88	8	4	0	52.4	47.6	48.6	35.6	10.3	1.4	4.1	0	0
		(85)	(13)	(2)	(0)	(66.5)	(33.5)	(54.2)	(32.2)	(8.1)	(2.8)	(2.7)	(0)	(0)
128	L-655	79	16	5	0	80.5	19.5	58.0	26.0	11.0	3.0	3.0	0	0
	656	89	8	3	0	89.4	10.6	32.6	15.0	36.0	15.0	2.0	0	0
		(84)	(12)	(4)	(0)	(85.0)	(15.0)	(45.0)	(20.5)	(23.5)	(8.5)	(2.5)	(0)	(0)
135	L-320	82	14	4	0	53.0	47.0	33.3	45.4	13.5	5.7	2.1	0	0
140	L-722	80	15	5	0	82.4	17.6	73.0	11.0	11.0	5.0	0	0	0
151	L-376	80	19	1	0	85.7	14.3	54.2	15.6	24.0	1.0	5.2	0	0
	720	78	20	2	0	86.1	13.9	57.0	22.0	19.0	1.0	1.0	0	0
		(79)	(20)	(1)	(0)	(85.9)	(14.1)	(55.6)	(18.8)	(21.5)	(1.0)	(3.1)	(0)	(0)
163	L-206	85	11	4	0	75.2	24.8	46.0	33.0	18.0	3.0	0	0	0
	207	77	14	9	0	74.6	25.4	48.0	26.0	23.0	1.0	2.0	0	0
	209	85	11	4	0	82.0	18.0	52.0	26.0	18.0	1.0	3.0	0	0
		(82)	(12)	(6)	(0)	(77.3)	(22.7)	(48.7)	(28.3)	(19.6)	(1.7)	(1.7)	(0)	(0)
172	L-753	93	4	3	0	63.7	36.3	51.7	26.3	13.2	7.0	1.8	0	0
	754	78	20	2	0	51.9	48.1	42.9	42.9	9.5	2.0	2.7	0	0
		(85)	(12)	(3)	(0)	(57.8)	(42.2)	(47.3)	(34.6)	(11.3)	(4.5)	(2.3)	(0)	(0)

Table 6.--Mineral ratios obtained in the disaggregated light-grain and heavy-mineral studies of 59 sandstone samples from the Recapture Member of the Morrison Formation--Continued

Map location	Sample No.	Light-grain study				Heavy-mineral study with ratios given in percent								
		Q	F	SRF	M	All heavies		Nonopaque heavies						
						O	NO	Z	T	G	S	R	A	E
175	L-745	79	20	1	0	87.7	12.3	37.3	17.6	22.6	7.8	1.0	3.9	9.8
	746	77	17	6	0	87.7	12.3	41.0	8.0	24.0	6.0	0	0	21.0
	747	83	12	5	0	38.0	62.0	65.5	12.9	18.0	2.6	1.0	0	0
	748	78	16	6	0	70.8	29.2	40.0	34.0	22.0	2.0	1.0	0	1.0
		(79)	(16)	(5)	(0)	(71.1)	(28.9)	(46.0)	(18.1)	(21.7)	(4.6)	(0.8)	(0.9)	(7.9)
195	L-714	83	16	1	0	64.3	35.7	57.9	29.0	8.4	1.9	2.8	0	0
207	L-771	86	12	2	0	68.7	31.3	58.0	15.0	23.0	1.0	2.0	0	1.0
	772	61	29	10	0	49.7	50.3	58.9	12.6	22.5	1.3	4.0	0	.7
	776	77	21	2	0	66.9	33.1	62.0	15.0	22.0	1.0	0	0	0
		(75)	(21)	(4)	(0)	(61.8)	(38.2)	(59.6)	(14.2)	(22.5)	(1.1)	(2.0)	(0)	(0.6)
209	L-638	88	6	6	0	83.9	16.1	40.0	11.0	26.0	13.0	5.0	0	5.0
	639	76	17	7	0	82.8	17.2	20.0	57.0	14.0	3.0	3.0	0	3.0
	640	69	26	5	0	57.7	42.3	70.1	10.2	11.8	3.9	2.4	.8	.8
		(78)	(16)	(6)	(0)	(74.8)	(25.2)	(43.4)	(26.0)	(17.3)	(6.6)	(3.5)	(0.3)	(2.9)
210	L-643	77	19	4	0	87.7	12.3	43.0	19.0	21.0	10.0	2.0	0	5.0
	742	83	14	3	0	79.7	20.3	52.0	26.0	13.0	3.0	6.0	0	0
		(80)	(17)	(3)	(0)	(83.7)	(16.3)	(47.5)	(22.5)	(17.0)	(6.5)	(4.0)	(0)	(2.5)
230	L-618	84	15	1	0	63.7	36.3	39.8	34.5	16.8	7.1	1.8	0	0
	619	83	17	0	0	63.4	36.6	40.7	28.3	17.7	12.4	.9	0	0
	620	79	20	1	0	78.5	21.5	40.0	26.0	21.0	9.0	1.0	3.0	0
	702	80	18	2	0	48.9	51.1	58.5	17.1	12.8	6.1	5.5	0	0
	703	77	20	3	0	30.5	69.5	49.8	22.4	17.3	7.8	2.7	0	0
	706	84	11	5	0	57.0	43.0	66.4	14.5	0	16.8	2.3	0	0
		(81)	(17)	(2)	(0)	(57.0)	(43.0)	(49.2)	(23.8)	(14.3)	(9.9)	(2.3)	(0.5)	(0)
Recapture Means		80.4	16.4	3.2	0.05	69.2	30.8	49.8	22.8	18.7	5.0	2.1	0.2	1.5



Table 7.--Mineral ratios obtained in the disaggregated light-grain and heavy-mineral studies of 58 sandstone samples from the Westwater Canyon Member of the Morrison Formation

[Map location refers to sample locality number on plate 1 of Professional Paper 556. Q, quartz; F, potassic and sodic feldspar; SRF, silicified-rock fragments including tuff; M, miscellaneous; O, opaques; NO, nonopaques; Z, zircon; T, tourmaline; G, garnet; S, staurolite; R, rutile; A, apatite; E, epidote. Values in parentheses are location averages (means)]

Map location	Sample No.	Light-grain study				Heavy-mineral study with ratios given in percent								
		Q	F	SRF	M	All heavies		Nonopaque heavies						
						O	NO	Z	T	G	S	R	A	E
7	L-566	87	4	9	0	67.9	32.1	80.0	4.7	14.3	0	1.0	0	0
	571	78	16	6	0	90.3	9.7	55.0	8.0	35.0	1.0	1.0	0	0
		(83)	(10)	(7)	(0)	(79.1)	(20.9)	(67.5)	(6.3)	(24.7)	(0.5)	(1.0)	(0)	(0)
28	L-371	85	14	1	0	62.3	37.7	61.5	11.1	10.3	12.8	4.3	0	0
	372	80	19	1	0	45.8	54.2	40.0	33.1	18.3	3.4	5.2	0	0
	373	78	19	3	0	37.7	62.3	49.5	26.6	14.4	7.4	2.1	0	0
		(81)	(17)	(2)	(0)	(48.6)	(51.4)	(50.3)	(23.6)	(14.3)	(7.9)	(3.9)	(0)	(0)
30	L-327	92	5	3	0	66.7	33.3	57.0	20.0	16.0	3.0	4.0	0	0
49	L-725	63	30	7	0	55.7	44.3	55.3	13.6	21.4	5.8	3.9	0	0
	726	73	26	1	0	64.4	35.6	59.0	11.0	14.2	12.6	2.4	.8	0
	.840	67	31	1	1	66.6	33.4	68.8	3.7	20.2	6.4	.9	0	0
		(68)	(29)	(3)	(0)	(62.2)	(37.8)	(61.0)	(9.4)	(18.6)	(8.3)	(2.4)	(0.3)	(0)
78	L-647	90	7	3	0	72.4	27.6	83.0	10.0	0	4.0	3.0	0	0
	648	82	15	3	0	76.4	23.6	74.0	14.0	9.0	3.0	0	0	0
	649	79	18	3	0	65.9	34.1	73.5	2.9	14.7	6.9	2.0	0	0
		(84)	(13)	(3)	(0)	(71.6)	(28.4)	(76.8)	(9.0)	(7.9)	(4.6)	(1.7)	(0)	(0)
79	L-777	76	20	4	0	82.7	17.3	79.0	11.0	3.0	6.0	1.0	0	0
	778	82	13	5	0	89.0	11.0	79.0	7.0	4.0	8.0	2.0	0	0
		(79)	(16)	(5)	(0)	(85.9)	(14.1)	(79.0)	(9.0)	(3.5)	(7.0)	(1.5)	(0)	(0)
83	L-790	75	24	1	0	91.5	8.5	59.0	7.0	16.0	3.0	0	0	15.0
	791	88	11	1	0	84.1	15.9	46.0	14.0	21.0	5.0	3.0	0	11.0
	792	80	20	0	0	77.7	22.3	50.5	14.8	12.9	3.0	2.0	0	16.8
		(81)	(18)	(1)	(0)	(86.7)	(13.3)	(51.8)	(11.9)	(16.6)	(3.7)	(1.7)	(0)	(14.3)

Table 7.--Mineral ratios obtained in the disaggregated light-grain and heavy-mineral studies of 58 sandstone samples from the Westwater Canyon Member of the Morrison Formation--Continued

Map location	Sample No.	Light-grain study				Heavy-mineral study with ratios given in percent								
		Q	F	SRF	M	All heavies		Nonopaque heavies						
						O	NO	Z	T	G	S	R	A	E
92	L-784	77	21	2	0	66.9	33.1	60.6	13.8	16.5	6.4	0.9	1.8	0
	785	67	31	2	0	79.4	20.6	67.0	17.0	7.0	3.0	6.0	0	0
	786	86	12	2	0	79.6	20.4	71.0	5.0	18.0	6.0	0	0	0
		(77)	(21)	(2)	(0)	(75.3)	(24.7)	(66.2)	(11.9)	(13.8)	(5.2)	(2.3)	(0.6)	(0)
114	L-863	64	33	1	2	96.4	3.6	80.0	9.0	0	11.0	0	0	0
118	L-761	82	15	3	0	75.1	24.9	47.0	15.0	22.0	13.0	3.0	0	0
	762	92	3	5	0	59.8	40.2	54.2	17.6	18.3	9.9	0	0	0
	763	95	4	1	0	53.9	46.1	58.9	26.2	1.4	7.8	5.7	0	0
		(90)	(7)	(3)	(0)	(62.9)	(37.1)	(53.4)	(19.6)	(13.9)	(10.2)	(2.9)	(0)	(0)
124	L-195	95	3	2	0	75.8	24.2	51.0	27.0	10.0	10.0	2.0	0	0
	196	78	17	5	0	69.9	30.1	44.6	23.9	17.4	9.8	4.3	0	0
	197	56	16	28	0	87.3	12.7	57.7	2.9	15.4	16.3	1.9	5.8	0
		(76)	(12)	(12)	(0)	(77.7)	(22.3)	(51.1)	(17.9)	(14.3)	(12.0)	(2.7)	(2.0)	(0)
128	L-653	86	11	3	0	67.9	32.1	49.5	28.7	10.9	10.9	0	0	0
	654	92	6	2	0	64.6	35.4	55.0	27.5	13.8	2.8	.9	0	0
		(89)	(9)	(2)	(0)	(66.3)	(33.7)	(52.2)	(28.1)	(12.4)	(6.8)	(0.5)	(0)	(0)
135	L-319	93	4	3	0	61.3	38.7	68.1	25.8	.9	5.2	0	0	0
140	L-721	75	19	6	0	52.7	47.3	80.8	6.0	7.9	2.0	3.3	0	0
151	L-374	83	16	1	0	77.5	22.5	42.0	19.6	31.2	6.3	.9	0	0
	375	80	19	1	0	53.0	47.0	46.8	15.6	32.6	1.4	3.6	0	0
	716	87	9	3	1	81.2	18.8	61.0	14.0	20.0	5.0	0	0	0
	717	81	15	4	0	80.9	19.1	54.6	13.1	20.2	12.1	0	0	0
		(83)	(15)	(2)	(0)	(73.2)	(26.8)	(51.1)	(15.6)	(26.0)	(6.2)	(1.1)	(0)	(0)
163	L-208	84	13	3	0	45.3	54.7	36.3	35.1	25.0	1.2	2.4	0	0
	210	86	12	2	0	76.8	23.2	62.0	8.0	21.0	9.0	0	0	0
		(85)	(13)	(2)	(0)	(61.0)	(39.0)	(49.1)	(21.6)	(23.0)	(5.1)	(1.2)	(0)	(0)
172	L-711	81	18	1	0	86.6	13.4	63.0	34.0	0	1.0	2.0	0	0
	712	83	14	3	0	86.2	13.8	44.0	28.0	7.0	20.0	1.0	0	0
	713	84	15	1	0	90.6	9.4	62.0	20.0	4.0	12.0	2.0	0	0
		(82)	(16)	(2)	(0)	(87.8)	(12.2)	(56.3)	(27.3)	(3.7)	(11.0)	(1.7)	(0)	(0)

Table 7.--Mineral ratios obtained in the disaggregated light-grain and heavy-mineral studies of 58 sandstone samples from the Westwater Canyon Member of the Morrison Formation--Continued

Map location	Sample No.	Light-grain study				Heavy-mineral study with ratios given in percent								
		Q	F	SRF	M	All heavies		Nonopaque heavies						
						O	NO	Z	T	G	S	R	A	E
175	L-749	76	15	9	0	85.4	14.6	48.0	11.0	25.0	15.0	1.0	0	0
	750	76	17	7	0	72.7	27.3	49.0	22.0	22.0	4.0	2.0	0	1.0
	751	84	15	1	0	47.0	53.0	55.7	8.9	15.2	16.4	3.2	0	.6
	752	90	8	2	0	31.6	68.4	62.9	11.4	13.8	11.4	.5	0	0
		(81)	(14)	(5)	(0)	(59.2)	(40.8)	(53.9)	(13.3)	(19.0)	(11.7)	(1.7)	(0)	(0.4)
195	L-715	93	4	3	0	94.6	5.4	54.0	16.0	12.0	18.0	0	0	0
207	L-773	73	25	2	0	78.6	21.4	56.0	10.0	27.0	6.0	0	0	1.0
	774	79	19	2	0	81.9	18.1	54.6	12.0	17.6	15.8	0	0	0
	775	78	18	4	0	97.4	2.6	60.0	19.0	11.0	10.0	0	0	0
		(76)	(21)	(3)	(0)	(86.0)	(14.0)	(56.9)	(13.7)	(18.5)	(10.6)	(0)	(0)	(0.3)
209	L-641	69	29	2	0	85.1	14.9	66.0	13.0	18.0	3.0	0	0	0
	642	82	15	3	0	71.0	29.0	67.0	10.0	15.0	4.0	1.0	2.0	1.0
		(76)	(22)	(2)	(0)	(78.1)	(21.9)	(66.5)	(11.5)	(16.5)	(3.5)	(0.5)	(1.0)	(0.5)
210	L-644	78	15	7	0	75.2	24.8	30.4	14.7	10.8	12.7	1.0	30.4	0
	645	70	23	7	0	87.9	12.1	82.0	7.0	4.0	7.0	0	0	0
	646	76	15	9	0	86.3	13.7	79.0	8.0	4.0	8.0	0	1.0	0
		(75)	(18)	(7)	(0)	(83.1)	(16.9)	(63.8)	(9.9)	(6.3)	(9.2)	(0.3)	(10.5)	(0)
215	L-395	85	5	10	0	73.6	26.4	71.4	8.2	17.3	0	3.1	0	0
	396	83	12	5	0	68.4	31.6	69.4	17.1	9.9	0	3.6	0	0
	397	89	7	4	0	82.8	17.2	66.0	12.0	18.0	0	4.0	0	0
		(86)	(8)	(6)	(0)	(74.9)	(25.1)	(68.9)	(12.4)	(15.1)	(0)	(3.6)	(0)	(0)
230	L-704	89	8	3	0	55.7	44.3	57.9	17.3	0	24.1	.7	0	0
	705	92	5	3	0	71.6	28.4	60.3	20.4	0	16.1	3.2	0	0
		(90)	(7)	(3)	(0)	(63.6)	(36.4)	(59.1)	(18.9)	(0)	(20.1)	(1.9)	(0)	(0)
Westwater Mean Canyon.		81.1	15.1	3.8	0.03	72.6	27.4	59.9	15.2	13.9	7.7	1.7	0.7	0.8



Table 8.--Mineral ratios obtained in the disaggregated light-grain and heavy-mineral studies of 49 sandstone samples from the Brushy Basin Member of the Morrison Formation

[Map location refers to sample locality number on plate 1 of Professional Paper 556. Q, quartz; F, potassic and sodic feldspar; SRF, silicified-rock fragments including tuff; M, miscellaneous; O, opaques; NO, nonopaques; Z, zircon; T, tourmaline; G, garnet; S, staurolite; R, rutile; A, apatite; E, epidote. Values in parentheses are location averages (means)]

Map location	Sample No.	Light-grain study				Heavy-mineral study with ratios given in percent								
		Q	F	SRF	M	All heavies		Nonopaque heavies						
						O	NO	Z	T	G	S	R	A	E
7	L-568	80	6	14	0	34.5	65.5	82.2	3.6	11.7	0	2.5	0	0
	569	84	10	6	0	67.4	32.6	51.0	13.0	31.0	2.0	3.0	0	0
		(82)	(8)	(10)	(0)	(51.0)	(49.0)	(66.6)	(8.3)	(21.3)	(1.0)	(2.8)	(0)	(0)
24	L-674	80	11	9	0	42.5	57.5	43.9	25.9	20.1	6.4	3.7	0	0
28	L-370	71	22	7	0	48.0	52.0	85.3	10.9	1.9	0	1.9	0	0
31	L-694	89	2	9	0	37.3	62.7	68.6	24.5	1.1	1.6	4.2	0	0
	695	83	2	15	0	40.7	59.3	61.8	25.8	6.2	3.4	2.8	0	0
		(86)	(2)	(12)	(0)	(39.0)	(61.0)	(65.2)	(25.1)	(3.7)	(2.5)	(3.5)	(0)	(0)
37	L-698	77	*Tr	23	0	91.7	8.3	79.0	13.2	3.9	3.9	0	0	0
56	L- 89	78	5	17	0	84.5	15.5	92.0	1.0	3.0	0	4.0	0	0
59	L-672	57	4	39	0	81.3	18.7	53.0	34.0	8.0	3.0	2.0	0	0
61	L-136	89	3	8	0	84.6	15.4	70.0	11.7	11.7	0	6.6	0	0
	137	85	7	8	0	81.0	19.0	83.0	13.0	2.0	0	1.0	1.0	0
		(87)	(5)	(8)	(0)	(82.8)	(17.2)	(76.5)	(12.4)	(6.8)	(0)	(3.8)	(0.5)	(0)
64	L-413	83	14	3	0	81.3	18.7	37.0	17.0	39.0	2.0	5.0	0	0
	414	87	3	10	0	90.2	9.8	58.0	10.0	30.0	0	2.0	0	0
	415	86	1	13	0	61.3	38.7	61.2	11.2	26.7	0	.9	0	0
	416	86	0	14	0	77.9	22.1	52.0	12.0	34.0	1.0	1.0	0	0
		(85)	(5)	(10)	(0)	(77.7)	(22.3)	(52.4)	(12.0)	(32.6)	(0.8)	(2.2)	(0)	(0)
73	L-815	78	19	3	0	54.7	45.3	55.2	27.2	13.2	1.5	2.9	0	0
86	L-687	38	1	61	0	58.7	41.3	57.3	17.7	14.5	8.9	1.6	0	0
88	L-853	83	9	8	0	44.0	56.0	64.9	13.1	15.5	4.1	2.4	0	0

\* Trace.

Table 8.--Mineral ratios obtained in the disaggregated light-grain and heavy-mineral studies of 49 sandstone samples from the Brushy Basin Member of the Morrison Formation--Continued

Map location	Sample No.	Light-grain study				Heavy-mineral study with ratios given in percent								
		Q	F	SRF	M	All heavies		Nonopaque heavies						
						O	NO	Z	T	G	S	R	A	E
112	L-678 680	89	3	8	0	60.7	39.3	51.7	25.4	19.5	0	3.4	0	0
		91	2	7	0	52.0	48.0	66.7	6.2	24.3	0	2.8	0	0
		(90)	(3)	(7)	(0)	(56.3)	(43.7)	(59.2)	(15.8)	(21.9)	(0)	(3.1)	(0)	(0)
124	L-241 243 244 **245	85	14	1	0	42.7	57.3	77.9	19.2	0	0	2.9	0	0
		81	7	12	0	86.9	13.1	80.0	12.0	6.0	0	2.0	0	0
		80	11	9	0	49.0	51.0	78.4	13.1	5.2	0	3.3	0	0
		89	6	5	0	98.4	1.6	53.0	22.0	23.0	1.0	0	1.0	0
		(84)	(9)	(7)	(0)	(69.3)	(30.7)	(72.3)	(16.7)	(8.5)	(0.2)	(2.1)	(0.2)	(0)
130	L-664	91	0	9	0	90.2	9.8	61.0	30.0	9.0	0	0	0	0
136-B	L-338	89	0	11	0	88.2	11.8	65.0	20.0	10.0	0	5.0	0	0
142 146	L-387 L-665 666	94	1	5	0	89.6	10.4	61.1	27.8	1.9	0	3.7	5.5	0
		81	6	13	0	45.7	54.3	23.9	59.5	10.4	0	2.5	3.7	0
		79	4	17	0	47.0	53.0	51.6	28.3	12.6	0	7.5	0	0
159	L-734 735 851 852	(80)	(5)	(15)	(0)	(46.3)	(53.7)	(37.8)	(43.9)	(11.5)	(0)	(5.0)	(1.8)	(0)
		91	4	5	0	40.8	59.2	58.5	23.5	6.5	11.5	0	0	0
		83	12	5	0	54.5	45.5	48.3	36.7	6.8	8.2	0	0	0
		92	7	1	0	46.1	53.9	59.0	13.1	13.0	12.4	1.9	0	.6
		84	0	16	0	94.2	5.8	75.0	12.0	9.0	3.0	0	1.0	0
161	L-682	(87)	(6)	(7)	(0)	(58.9)	(41.1)	(60.2)	(21.3)	(8.8)	(8.7)	(0.5)	(0.3)	(0.2)
		88	1	11	0	59.7	40.3	43.8	24.8	27.3	.8	3.3	0	0
173	L-507 676	86	9	5	0	58.4	41.6	46.6	19.5	19.5	11.3	2.3	.8	0
		92	4	4	0	63.7	36.3	63.3	28.4	1.8	2.8	3.7	0	0
		(89)	(6)	(5)	(0)	(61.0)	(39.0)	(55.0)	(24.0)	(10.6)	(7.0)	(3.0)	(0.4)	(0)
174	L-211 212 213 214	62	0	38	0	79.3	20.7	54.0	26.0	15.0	0	5.0	0	0
		80	6	14	0	39.1	60.9	59.2	23.4	13.0	0	4.4	0	0
		92	4	4	0	42.3	57.7	65.1	19.2	14.5	0	1.2	0	0
		78	3	19	0	84.9	15.1	47.0	20.0	28.0	3.0	2.0	0	0
		(78)	(3)	(19)	(0)	(61.4)	(38.6)	(56.3)	(22.1)	(17.6)	(0.8)	(3.2)	(0)	(0)

\*\* Opaque count discontinued at 321--5 nonopaques.

Table 8.--Mineral ratios obtained in the disaggregated light-grain and heavy-mineral studies of 49 sandstone samples from the Brushy Basin Member of the Morrison Formation--Continued

Map location	Sample No.	Light-grain study				Heavy-mineral study with ratios given in percent								
		Q	F	SRF	M	All heavies		Nonopaque heavies						
						O	NO	Z	T	G	S	R	A	E
177	L-528	94	0	6	0	89.4	10.6	62.8	32.9	0	0	1.4	2.9	0
	529	75	10	15	0	78.5	21.5	60.0	30.0	0	0	6.0	4.0	0
		(84)	(5)	(11)	(0)	(84.0)	(16.0)	(61.4)	(31.4)	(0)	(0)	(3.7)	(3.5)	(0)
178	L-225	38	4	58	0	27.4	72.6	37.7	9.2	51.3	.5	1.3	0	0
181	L-686	95	2	3	0	84.0	16.0	56.6	19.2	11.1	12.1	1.0	0	0
189	L-685	23	0	77	0	56.4	43.6	71.0	23.3	5.7	0	0	0	0
	686	30	1	69	0	58.7	41.3	65.3	11.3	19.4	4.0	0	0	0
		(26)	(1)	(73)	(0)	(57.6)	(42.4)	(68.2)	(17.3)	(12.5)	(2.0)	(0)	(0)	(0)
199	L-684	91	4	5	0	41.7	58.3	60.2	14.8	22.7	0	2.3	0	0
208	L-409	75	7	18	0	53.3	46.7	40.6	28.4	23.6	0	7.4	0	0
	412	45	6	49	0	13.6	86.4	69.8	3.1	18.9	0	8.2	0	0
		(60)	(7)	(33)	(0)	(33.4)	(66.6)	(55.2)	(15.8)	(21.2)	(0)	(7.8)	(0)	(0)
Brushy Basin.	Mean	78.6	5.3	16.1	0	62.8	37.2	60.6	19.7	14.3	2.2	2.7	0.4	0

BASIC ANALYTICAL DATA SUMMARIZED IN  
U.S. GEOLOGICAL SURVEY PROFESSIONAL  
PAPER 556 BY ROBERT A. CADIGAN, 1967



Table 9.--Data obtained from the grain-size distribution analyses of 21 siltstone and claystone samples from the Salt Wash Member of the Morrison Formation

[Map location refers to sample locality number on figure 8 of Professional Paper 556 . St. dev., standard deviation; Skew., skewness; Kurt., kurtosis; percentiles in phi terms are shown as  $\phi_2$  (second percentile),  $\phi_5$  (fifth percentile), etc. Asterisk (\*) indicates thin-section modal analysis of sample is given in Professional Paper, table 12. Values in parentheses are location averages (means)]

Map location	Sample No.	Grain size (mm)		Parameters of the phi grain-size distribution										
		Mode	Median	Mean	St. dev.	Skew.	Kurt.	$\phi_2$	$\phi_5$	$\phi_{16}$	$\phi_{50}$	$\phi_{84}$	$\phi_{95}$	$\phi_{98}$
25	*L-2793	0.039	0.062	4.810	2.140	9.110	1.990	3.07	3.17	3.48	4.00	6.68	10.40	11.46
	* 2794	.058	.049	4.670	1.740	1.033	4.629	3.04	3.15	3.42	4.35	5.71	8.70	11.05
	* 2795	.046	.057	4.580	1.570	1.177	6.299	3.07	3.17	3.54	4.13	5.40	8.25	10.40
	* 2796	.005	.005	7.590	2.190	-.002	-.655	3.63	3.91	5.28	7.60	9.98	11.50	11.81
		(0.037)	(0.043)	(5.413)	(1.910)	(2.830)	(3.066)	(3.20)	(3.35)	(3.93)	(5.02)	(6.94)	(9.71)	(11.18)
31	L-480	.105	.026	6.101	3.137	.211	-1.281	2.49	2.68	2.98	5.25	10.05	11.65	11.85
56	*L-471	.031	.027	5.399	2.412	.195	-.612	1.73	1.98	2.82	5.23	8.05	9.95	10.60
64	*L-421	.059	.018	7.103	2.619	.096	-1.215	3.42	3.78	4.16	7.06	9.98	11.58	11.87
67	*L-456	.088	.015	6.569	2.998	.153	-1.374	2.70	3.00	3.47	6.05	10.32	11.72	11.93
105	L-475	.031	.011	6.759	2.099	.210	-.431	3.25	3.88	4.72	6.45	8.97	10.87	11.60
	* 2807	.049	.040	5.221	1.939	.712	1.281	3.03	3.15	3.57	4.64	6.96	10.13	10.65
	* 2808	.050	.042	5.199	2.105	.633	.755	2.36	2.92	3.43	4.57	7.37	10.27	10.71
	* 2809	.076	.046	5.330	2.483	.452	-.401	2.13	2.47	3.20	4.43	8.52	10.48	10.79
	* 2810	.054	.048	4.818	1.775	.869	2.747	2.53	3.04	3.39	4.38	6.11	9.28	10.50
		(0.052)	(0.037)	(5.465)	(2.080)	(0.575)	(0.790)	(2.66)	(3.09)	(3.66)	(4.70)	(7.59)	(10.21)	(10.85)
115	*L-3448	.000	.006	7.033	2.937	.074	1.578	2.29	2.89	3.49	7.49	10.38	10.81	10.92
124	*L-189	.062	.038	5.588	1.884	.460	.437	2.92	3.18	3.63	4.78	8.53	9.70	9.92
174	L-448	.075	.010	6.624	2.833	.048	-1.138	2.05	2.92	3.50	6.60	9.77	11.42	11.85
	449	.005	.006	7.260	2.224	-.005	-.791	3.33	3.72	4.57	7.38	9.60	11.10	11.82
	* 450	.045	.020	6.415	2.221	.374	-.600	3.83	4.02	4.30	5.60	9.05	10.90	11.78
	451	.088	.045	5.888	2.903	.320	-.890	2.18	2.55	3.22	4.50	9.50	11.65	11.90
		(0.053)	(0.020)	(6.547)	(2.545)	(0.814)	(-0.855)	(2.85)	(3.30)	(3.90)	(6.02)	(9.48)	(11.27)	(11.84)
228	L-533	.062	.043	5.886	2.660	0.415	-.720	3.08	3.30	3.70	4.53	9.40	11.35	11.70
	534	.002	.003	8.093	2.087	-.206	-.253	3.45	3.95	6.03	8.25	10.20	11.50	11.85
		(0.032)	(0.023)	(6.990)	(2.374)	(0.105)	(-0.487)	(3.27)	(3.63)	(4.87)	(6.39)	(9.80)	(11.43)	(11.78)

Table 10.--Data obtained from the grain-size distribution analyses of 18 siltstone and claystone samples from the Brushy Basin Member of the Morrison Formation

[Map location refers to sample locality number on plate 1 of Professional Paper 556. St. dev., standard deviation; Skew., skewness; Kurt., kurtosis; percentiles in phi terms are shown as  $\phi_2$  (second percentile),  $\phi_5$  (fifth percentile), etc. Asterisk (\*) indicates thin-section modal analysis of sample is given in Professional Paper, table 20. Values in parentheses are location averages (means)]

Map location	Sample No.	Grain size (mm)		Parameters of the phi grain-size distribution											
		Mode	Median	Mean	St. dev.	Skew.	Kurt.	$\phi_2$	$\phi_5$	$\phi_{16}$	$\phi_{50}$	$\phi_{84}$	$\phi_{95}$	$\phi_{98}$	
-34-	31	L-478	0.0004	0.001	9.599	1.943	-0.531	0.550	4.40	5.92	7.45	10.20	11.45	11.82	11.92
		479	.004	.005	7.319	1.742	-.006	-.211	3.85	4.38	5.68	7.32	9.02	10.25	11.40
			(0.0022)	(0.003)	(8.459)	(1.843)	(-0.269)	(0.169)	(4.13)	(5.15)	(6.57)	(8.76)	(10.24)	(11.04)	(11.66)
	56	L-468	.088	.006	7.197	3.155	.002	-1.480	2.62	2.95	3.45	7.45	11.23	11.88	11.97
		469	.031	.018	6.303	2.447	.275	-.435	2.45	3.10	3.98	5.77	9.20	11.45	11.85
		470	.019	.015	6.426	1.922	.227	-.368	3.45	3.77	4.48	6.10	8.55	9.95	10.85
			(0.046)	(0.013)	(6.642)	(2.508)	(0.168)	(-0.761)	(2.84)	(3.27)	(3.97)	(6.44)	(9.66)	(11.09)	(11.56)
	61	L-464	.074	.021	5.957	2.721	.234	-.849	2.10	2.45	3.12	5.55	9.12	11.33	11.82
	67	L-455	.0003	.002	8.393	2.672	-.254	-.906	3.13	3.75	5.17	8.92	11.38	11.87	11.96
	72	L-460	.045	.022	6.319	2.599	.288	-.838	2.83	3.20	3.88	5.55	9.48	11.45	11.87
105	L-474	.004	.004	7.735	2.274	-.132	-.425	3.12	3.65	5.47	7.87	9.98	11.70	11.93	
115	*L-3451	.000	.008	6.689	2.650	-.062	-1.139	2.10	2.39	3.44	6.94	10.03	10.70	10.88	
174	L-442	.022	.009	6.929	2.540	.002	-.257	1.95	3.08	4.63	6.72	9.80	11.55	11.88	
	443	.062	.052	4.503	2.698	.156	-.032	-.75	.25	1.88	4.30	7.18	9.62	10.85	
	444	.004	.004	7.802	1.791	-.092	.353	3.75	4.47	6.28	7.82	9.22	11.10	11.73	
	445	.062	.007	6.983	1.908	.011	-.320	3.65	3.82	5.25	6.98	8.95	9.98	11.45	
	446	.004	.004	7.819	2.080	-.236	.189	3.35	3.90	5.95	8.03	9.75	11.37	11.82	
	447	.004	.008	7.064	2.334	.031	-.751	2.95	3.35	4.45	7.05	9.55	11.17	11.70	
			(0.026)	(0.014)	(6.850)	(2.225)	(-0.021)	(-0.136)	(2.48)	(3.15)	(4.74)	(6.82)	(9.08)	(10.80)	(11.57)
228	L-535	.052	.003	7.542	2.729	-.224	-.933	2.40	2.78	4.07	8.30	10.10	11.55	11.85	
	536	.001	.002	8.131	2.421	-.280	-.407	2.95	3.65	5.48	8.65	10.65	11.73	11.88	
			(0.027)	(0.003)	(7.837)	(2.575)	(-0.252)	(-0.670)	(2.68)	(3.22)	(4.78)	(8.48)	(10.38)	(11.64)	(11.87)

Table 11.--Data obtained from the grain-size distribution analyses of 19 miscellaneous siltstone and claystone samples from formations of Jurassic and Cretaceous age which overlie or underlie the Morrison Formation

[Map location refers to sample locality number on plate 1 of Professional Paper 556. St. dev., standard deviation; Skew., skewness; Kurt., kurtosis; percentiles in phi terms are shown as  $\phi_2$  (second percentile),  $\phi_5$  (fifth percentile), etc. Values in parentheses are location averages (means)]

Map location	Sample No.	Grain size (mm)		Parameters of the phi grain-size distribution										
		Mode	Median	Mean	St. dev.	Skew.	Kurt.	$\phi_2$	$\phi_5$	$\phi_{16}$	$\phi_{50}$	$\phi_{84}$	$\phi_{95}$	$\phi_{98}$
Burro Canyon Formation (Cretaceous)														
31	L-477	0.042	0.011	7.144	2.615	0.214	-1.167	3.75	4.05	4.47	6.45	10.85	11.78	11.92
56	L-467	.088	.024	6.377	3.230	.195	-1.290	1.98	2.48	3.18	5.45	11.05	11.85	11.95
67	L-454	.062	.037	5.180	2.273	.375	.151	1.65	2.10	3.12	4.80	7.65	9.75	11.00
72	L-459	.031	.011	6.907	2.847	.094	-1.125	2.30	2.80	3.77	6.55	10.60	11.77	11.92
174	L-440	.016	.014	6.482	1.848	.125	-.262	3.35	3.78	4.80	6.22	8.33	9.70	10.55
	441	.032	.009	6.989	2.075	.170	-.640	3.82	4.10	4.83	6.78	9.23	10.85	11.55
		(0.024)	(0.012)	(6.736)	(1.962)	(0.148)	(-0.451)	(3.59)	(3.94)	(4.92)	(6.50)	(8.78)	(10.28)	(11.05)
Dakota Sandstone (Cretaceous)														
61	L-466	0.016	0.002	8.603	2.203	-0.094	-1.115	4.33	5.25	6.03	8.85	11.32	11.83	11.95
72	L-458	.001	.002	9.121	2.051	-.468	.730	3.83	4.15	7.42	9.33	11.48	11.88	11.97
Cedar Mountain Formation (Cretaceous)														
228	L-537	0.038	0.012	6.942	2.529	0.211	-0.955	3.15	3.75	4.48	6.38	10.20	11.65	11.90
	538	.062	.006	7.240	2.187	-.141	-.791	3.40	3.70	4.42	7.48	9.52	10.40	11.05
		(0.050)	(0.009)	(7.091)	(2.358)	(0.035)	(-0.873)	(3.28)	(3.73)	(4.45)	(6.93)	(9.86)	(11.03)	(11.48)
Summerville Formation (Jurassic)														
31	L-481	0.016	0.008	7.605	2.429	0.188	-1.110	4.03	4.43	5.18	7.02	11.15	11.82	11.92
56	L-472	.052	.037	5.220	1.795	.515	.797	2.83	3.00	3.78	4.72	6.95	9.15	10.25
61	L-463	.125	.053	4.818	2.120	.599	1.022	2.63	2.82	2.98	4.22	6.93	9.20	11.10
67	L-457	.125	.029	5.671	2.454	.410	-.396	2.75	2.88	3.13	5.10	8.45	10.75	11.75
72	L-462	.001	.002	8.539	2.239	-.378	-.003	3.57	3.78	6.43	8.92	10.98	11.78	11.92
105	L-476	.062	.032	5.632	2.331	.422	-.121	2.83	2.93	3.62	4.95	8.25	10.40	11.75
174	L-452	.062	.036	5.679	2.245	.435	-.288	3.30	3.55	3.80	4.82	8.33	10.10	11.30
	453	.062	.009	6.888	2.640	.111	-1.281	3.45	3.62	4.03	6.77	9.75	11.55	11.85
		(0.062)	(0.023)	(6.284)	(2.443)	(0.273)	(-0.785)	(3.38)	(3.59)	(3.92)	(5.80)	(9.04)	(10.83)	(11.58)
228	L-532	.004	.005	7.552	2.359	-.004	-.760	3.45	3.68	4.50	7.78	9.85	11.68	11.90



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Table 12.--Summary of results of grain-size analyses of 49 siltstone samples from the Summerville Formation (Js) and the Salt Wash (Jmsw) and Brushy Basin (Jmbb) Members of the Morrison Formation of Jurassic age and from the Burro Canyon Formation (Kbc), Cedar Mountain Formation (Kcm), and the Dakota Sandstone (Kd) of Cretaceous age

[Location number refers to plate 1 of Professional Paper 556 . Analyses in percent]

Formation	Sample No.	Sand (and granules)	Coarse and medium silt	Fine and very fine silt	Total silt	Clay	Classification
Salt Wash, near Floy, Utah; location No. 174							
Kbc	L-440	5.58	41.21	32.48	73.69	20.73	Siltstone.
Kbc	L-441	3.60	33.05	32.20	65.25	31.15	Do.
Jmbb	L-442	5.51	33.55	28.62	62.17	32.32	Do.
Jmbb	L-443	18.51	54.67	16.42	71.09	10.40	Sandy siltstone.
Jmbb	L-444	2.16	10.79	43.05	53.84	44.00	Siltstone.
Jmbb	L-445	9.34	21.66	40.54	62.20	28.46	Do.
Jmbb	L-446	4.07	12.47	33.30	45.70	50.16	Silty claystone or silty shale.
Jmbb	L-447	8.09	25.91	30.47	56.38	35.53	Siltstone.
Jmsw	L-448	22.49	22.53	17.40	39.93	37.58	Sandy siltstone.
Jmsw	L-449	6.47	23.98	30.49	54.47	39.06	Siltstone.
Jmsw	L-450	4.75	51.25	16.27	67.52	27.73	Do.
Jmsw	L-451	26.56	34.31	11.84	46.15	27.29	Sandy siltstone.
Js	L-452	29.24	34.72	17.61	52.33	18.43	Do.
Js	L-453	15.56	29.75	15.16	44.91	39.53	Do.
Unaweep Canyon, near Grand Junction, Colo.; location No. 67							
Kbc	L-454	20.61	50.01	16.13	66.14	13.25	Sandy siltstone.
Jmbb	L-455	5.86	17.44	16.51	33.95	60.19	Silty claystone or silty shale.
Jmsw	L-456	27.19	22.65	12.95	35.60	37.21	Sandy siltstone.
Js	L-457	17.46	45.73	18.28	64.01	18.53	Do.
Escalante Canyon, near Escalante, Colo.; location No. 72							
Kd	L-458	4.33	2.79	17.12	19.91	75.76	Silty claystone or silty shale.
Kbc	L-459	10.41	33.74	20.12	53.86	35.73	Sandy siltstone.
Jmbb	L-460	16.70	39.13	15.65	54.78	28.52	Do.
Jmsw	L-461	9.88	70.79	8.07	78.86	11.26	Do.
Js	L-462	7.41	6.16	18.53	24.68	67.90	Silty claystone or silty shale.

Table 12.--Summary of results of grain-size analyses of 49 siltstone samples from the Summerville Formation (Js) and the Salt Wash (Jmsw) and Brushy Basin (Jmbb) Members of the Morrison Formation of Jurassic age and from the Burro Canyon Formation (Kbc), Cedar Mountain Formation (Kcm), and the Dakota Sandstone (Kd) of Cretaceous age--  
Continued

Formation	Sample No.	Sand (and granules)	Coarse and medium silt	Fine and very fine silt	Total silt	Clay	Classification
Dry Creek anticline, near Naturita, Colo.; location No. 61							
Kd	L-466	1.14	14.74	25.78	40.52	58.34	Silty claystone or silty shale.
Kbc	L-465	76.10	18.70	2.13	20.83	3.07	Sandy siltstone.
Jmbb	L-464	19.56	35.83	19.34	55.17	25.27	Do.
Js	L-463	27.14	49.62	13.25	62.87	9.99	Do.
Dolores Group, near Uravan, Colo.; location No. 56							
Kbc	L-467	23.04	30.87	12.89	43.76	33.20	Sandy siltstone.
Jmbb	L-468	20.16	21.26	12.79	34.05	45.79	Do.
Jmbb	L-469	12.01	40.95	23.04	63.99	24.00	Do.
Jmbb	L-470	7.99	40.59	29.22	69.81	22.20	Siltstone.
Jmsw	L-471	13.54	49.44	21.01	70.45	16.01	Sandy siltstone.
Js	L-472	19.08	55.50	16.46	71.96	8.96	Do.
La Sal Creek, southwest of Paradox, Colo.; location No. 105							
Kbc	L-473	52.53	31.51	8.01	39.52	7.95	Silty sandstone.
Jmbb	L-474	5.74	17.36	29.91	47.27	46.99	Siltstone.
Jmsw	L-475	4.19	38.26	30.32	68.58	27.23	Do.
Js	L-476	24.18	39.29	19.18	58.47	17.35	Sandy siltstone.
Cane Spring, south of Moab, Utah; location No. 31							
Kbc	L-477	3.76	40.89	17.90	58.79	37.45	Siltstone.
Jmbb	L-478	1.32	3.76	15.39	19.15	79.53	Claystone or shale.
Jmbb	L-479	3.54	17.02	45.28	62.30	34.16	Siltstone.
Jmsw	L-480	25.30	28.56	14.25	42.81	31.89	Sandy siltstone.
Js	L-481	1.98	30.88	29.94	60.82	37.20	Siltstone.
Woodside anticline, north of Green River, Utah; location No. 228							
Kcm	L-538	9.81	18.75	29.91	48.66	41.53	Siltstone.
Kcm	L-537	5.05	40.29	21.94	62.23	32.72	Do.
Jmbb	L-536	5.42	16.40	18.75	35.15	59.43	Silty claystone or silty shale.
Jmbb	L-535	8.25	22.71	14.43	37.14	54.61	Do.
Jmsw	L-534	5.06	10.83	28.64	39.47	55.47	Do.
Jmsw	L-533	30.50	33.95	8.99	42.94	26.56	Sandy siltstone.
Js	L-532	9.99	15.55	29.92	45.47	44.54	Do.

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Table 13.--Miscellaneous data obtained from the grain-size and mineralogical studies of 266 sandstone samples from the Salt Wash Member of the Morrison Formation

[Map location refers to sample locality number on plate 1 of Professional Paper 556. Values in parentheses are location averages (means). In barite column the symbols refer to the proportion of barite in the heavy-mineral suite: 0, absent, or less than 1 percent; C, common, about 1-5 percent; A, abundant, about 5-20 percent; D, dominant, more than any other mineral, about 20-50 percent; F, flood, more than all other minerals, about 50-100 percent]

Map location	Sample No.	Components by weight (in percent)			Barite	Total heavy minerals in percent of detrital fraction (excluding barite)
		Acid solubles	Sand	Fines		
2	L 657	1.7	92.70	7.30	F	0.22
	658	2.7	84.73	15.27	F	.20
	659	1.6	92.00	8.00	F	.05
						(0.16)
3	L 608	5.0	84.80	15.20	0	.10
	609	6.2	77.10	22.90	C	.09
	610	6.5	84.30	15.70	0	.07
						(0.09)
7	L 358	4.0	96.90	3.10	0	.04
	359	6.2	93.80	6.20	0	.17
	360	6.6	98.30	1.70	0	.08
						(0.10)
8 12	L 368	12.4	85.60	14.40	F	.05
	L 345	14.9	93.12	6.88	F	.13
	346	21.9	97.90	2.10	0	.10
	347	5.1	96.54	3.46	0	.15
						(0.13)
19	L 332	15.8	94.30	5.70	F	.04
	333	18.9	93.20	6.80	A	.10
						(0.07)
24	L 482	17.1	92.25	7.75	0	.19
	483	12.6	91.80	8.20	0	.06
	484	30.4	70.20	29.80	A	.23
						(0.16)
27	L 344	13.9	93.80	6.20	A	.38



Table 13.--Miscellaneous data obtained from the grain-size and mineralogical studies of 266 sandstone samples from the Salt Wash Member of the Morrison Formation--Continued

Map location	Sample No.	Components by weight (in percent)			Barite	Total heavy minerals in percent of detrital fraction (excluding barite)
		Acid solubles	Sand	Fines		
28	L 393	1.3	97.83	2.17	A	0.23
	394	1.1	98.46	1.54	O	.23 (0.23)
29	L 816	33.6	97.90	2.10	C	.05
	817	10.3	90.10	9.90	O	.25
	818	7.4	95.30	4.70	O	.06
	819	8.9	91.70	8.30	O	.28 (0.16)
31	L 492	3.5	98.20	1.80	A	.05
	493	11.2	95.50	4.50	C	.01
	494	8.8	93.90	6.10	F	.03
	495	7.4	97.60	2.40	D	.01 (0.03)
37	L 491	22.6	92.70	7.30	O	.13
	500	9.8	95.10	4.90	F	.13
	501	1.1	97.90	2.10	A	.27 (0.18)
40	L 731	76.1	86.64	13.36	C	.47
	732	33.4	97.10	2.90	O	.11
	821	8.6	97.39	2.61	O	.06
	822	18.1	96.10	3.90	O	.02
	823	2.8	94.90	5.10	C	.14
	824	4.0	84.90	15.10	O	.19 (0.17)
45	L 808	35.6	95.83	4.17	C	.21
	809	7.6	91.48	8.52	C	.29
	810	4.5	96.11	3.89	A	.13
	811	7.0	94.73	5.27	C	.08 (0.18)
56	L 14	7.1	95.86	4.14	O	.14
	15	6.5	97.28	2.72	O	1.53
	16	16.3	97.84	2.16	D	.32
	17	19.7	90.74	9.26	A	.50
	18	7.9	98.11	1.89	O	.97
	19	10.4	78.43	21.57	O	.05
	20	14.5	97.41	2.59	A	1.17 (0.67)

Table 13.--Miscellaneous data obtained from the grain-size and mineralogical studies of 266 sandstone samples from the Salt Wash Member of the Morrison Formation--Continued

Map location	Sample No.	Components by weight (in percent)			Barite	Total heavy minerals in percent of detrital fraction (excluding barite)
		Acid solubles	Sand	Fines		
59	L 628	38.6	96.50	3.50	0	0.09
	629	32.1	92.30	7.70	D	.06
	630	18.2	96.80	3.20	0	.13
						(0.09)
61	L 50	9.2	97.65	2.35	0	.10
	51	7.7	98.27	1.73	A	.16
	52	8.4	96.85	3.15	A	.54
	53	19.2	95.97	4.03	0	.28
	54	14.9	89.37	10.63	A	.20
						(0.26)
64	L 417	9.8	90.30	9.70	D	1.02
	418	5.8	97.66	2.34	F	.08
	419	12.6	94.50	5.50	F	.03
	420	23.3	92.90	7.10	D	.37
	422	33.7	94.10	5.90	F	.12
						(0.32)
71	L 2762	32.1	53.06	46.94	0	.04
	L 2763	16.2	84.49	15.51	0	.10
						(0.07)
72	L 405	7.7	94.60	5.40	F	.04
	406	24.8	95.70	4.30	A	.08
	407	10.0	92.00	8.00	D	.08
						(0.07)
73	L 812	25.8	95.50	4.50	C	.06
	813	5.6	89.70	10.30	0	.16
	814	1.8	93.80	6.20	0	.03
						(0.08)
75	L 804	14.4	95.31	4.69	C	.10
	805	5.7	95.62	4.38	A	.10
	806	14.8	78.21	21.79	0	.34
	807	35.2	95.09	4.91	0	.17
						(0.18)
81	L 834	28.1	82.29	17.71	0	.12
	835	42.4	81.05	18.95	0	.17
	836	39.5	91.58	8.42	F	.19
						(0.16)

Table 13.--Miscellaneous data obtained from the grain-size and mineralogical studies of 266 sandstone samples from the Salt Wash Member of the Morrison Formation--Continued

Map location	Sample No.	Components by weight (in percent)			Barite	Total heavy minerals in percent of detrital fraction (excluding barite)
		Acid solubles	Sand	Fines		
86	L 631	15.1	96.30	3.70	0	0.16
	632	25.3	94.40	5.60	0	.09
	633	22.9	97.30	2.70	0	.04
	637	1.2	92.00	8.00	0	.07 (0.09)
88	L 845	32.4	91.20	8.80	0	.81
	846	14.3	98.62	1.38	0	.02
	847	39.7	75.50	24.50	0	.15
	848	20.6	93.95	6.05	F	.08
	849	22.9	92.51	7.49	0	.57 (0.33)
90	L 488	4.7	97.20	2.80	D	.12
	489	14.8	90.20	9.80	F	.13
	490	23.5	95.60	4.40	A	.04 (0.10)
93	L 31	11.4	94.10	5.90	A	.32
	32	13.5	89.30	10.70	C	.61
	33	10.2	94.80	5.20	0	.92 (0.62)
99	L 353	14.5	89.20	10.80	F	.03
	354	14.1	95.20	4.80	D	.16
	355	4.0	94.80	5.20	D	.04
	356	11.9	89.60	10.40	F	.06
	357	3.9	96.28	3.72	D	.06
	366	15.6	84.50	15.50	A	.38
	977	10.5	90.25	9.75	D	.20
	978	7.5	90.80	9.20	F	.03 (0.12)
105	L 34	11.8	97.79	2.21	C	.45
	35	7.9	96.87	3.13	A	.64
	36	9.9	97.95	2.05	0	.57
	37	20.9	95.33	4.67	0	.05
	38	4.9	97.55	2.45	0	.86
	39	11.1	97.43	2.57	0	.28
	40	11.8	98.20	1.80	0	.24 (0.44)



Table 13.--Miscellaneous data obtained from the grain-size and mineralogical studies of 266 sandstone samples from the Salt Wash Member of the Morrison Formation--Continued

Map location	Sample No.	Components by weight (in percent)			Barite	Total heavy minerals in percent of detrital fraction (excluding barite)
		Acid solubles	and	Fines		
107	L 636	23.1	89.60	10.40	F	0.16
	843	31.9	88.90	11.10	A	.08
	844	61.0	94.83	5.17	F	.02
						(0.09)
112	L 502	5.6	95.00	5.00	C	.02
	503	9.2	94.90	5.10	C	.03
	504	23.8	94.50	5.50	C	.08
						(0.04)
115	L 341	16.9	92.73	7.27	F	.02
	3447	35.0	78.91	21.09	A	.11
	342	7.3	98.20	1.80	O	.06
	3449	26.8	77.46	22.54	O	.09
						(0.07)
121	L 605	6.0	84.30	15.70	A	.03
	606	10.3	85.10	14.90	A	.03
	607	3.8	83.70	16.30	A	.10
						(0.05)
124	L 190	16.9	89.80	10.20	D	.56
	191	6.9	96.50	3.50	O	.51
						(0.54)
125	L 557	5.6	63.00	37.00	A	.14
	558	9.0	78.10	21.90	A	.09
	559	17.6	75.50	24.50	A	.16
						(0.13)
130	L 485	5.9	94.20	5.80	A	.17
	486	15.1	98.10	1.90	F	.09
	487	5.7	98.00	2.00	A	.05
						(0.10)
133	L 379	2.3	96.60	3.40	O	.04
135	L 321	2.8	94.00	6.00	O	.34
136-A	L 95	1.4	91.47	8.53	O	.16
	98	1.6	86.70	13.30	C	.10
	106	2.9	91.31	8.69	F	.11
						(0.12)
136-B	L 334	20.5	92.00	8.00	A	.50
	335	11.8	87.40	12.60	O	.12
	336	8.6	85.30	14.70	D	.42
	337	13.0	79.56	20.44	F	.12
						(0.29)

Table 13.--Miscellaneous data obtained from the grain-size and mineralogical studies of 266 sandstone samples from the Salt Wash Member of the Morrison Formation--Continued

Map location	Sample No.	Components by weight (in percent)			Barite	Total heavy minerals in percent of detrital fraction (excluding barite)
		Acid solubles	Sand	Fines		
138	L 343	15.9	83.45	16.55	0	0.31
142	L 331	31.7	97.60	2.40	A	.05
	388	10.7	95.90	4.10	A	.12
	389	14.8	90.60	9.40	D	.41
	390	26.8	81.80	18.20	F	.12 (0.18)
146	L 625	21.8	71.70	28.30	F	.06
	626	17.3	90.40	9.60	0	.12
	627	15.5	89.00	11.00	0	.02 (0.07)
148	L 825	10.0	94.00	6.00	A	.11
	826	5.1	95.40	4.60	0	.04
	827	8.4	96.55	3.45	0	.03
	828	10.0	96.39	3.61	A	.05
	829	1.2	97.00	3.00	A	.23
	830	1.0	93.80	6.20	0	.15 (0.10)
150	L 45	4.5	94.90	5.10	A	.08
	46	1.8	96.00	4.00	A	.08
	47	1.6	97.49	2.51	F	.55 (0.24)
151	L 377	5.1	97.83	2.17	0	.92
	378	2.3	97.10	2.90	0	.32 (0.62)
159	L 736	25.9	98.29	1.71	0	.07
	737	19.3	98.10	1.90	0	.13
	850	29.0	91.61	8.39	C	.33
	851	.2	98.12	1.88	0	.16
	852	.6	95.31	4.69	0	.03
	2955	26.2	95.46	4.54	C	.03 (0.13)
160	L 508	17.5	93.05	6.95	F	.05
	509	11.2	88.60	11.40	A	.77
	510	11.6	92.00	8.00	F	.04
	511	10.5	91.70	8.30	D	.11 (0.24)

Table 13.--Miscellaneous data obtained from the grain-size and mineralogical studies of 266 sandstone samples from the Salt Wash Member of the Morrison Formation--Continued

Map location	Sample No.	Components by weight (in percent)			Barite	Total heavy minerals in percent of detrital fraction (excluding barite)
		Acid solubles	Sand	Fines		
161	L 496	26.8	96.10	3.90	F	0.03
	497	10.8	97.10	2.90	O	.54
	498	9.5	94.00	6.00	O	.12
	499	1.9	94.90	5.00	F	.15
						(0.21)
162	L 300	10.3	96.90	3.10	O	.05
	301	34.0	90.80	9.20	O	.19
	302	10.7	92.80	7.20	O	.17
						(0.14)
163	L 312	12.2	97.05	2.95	F	.14
	391	4.0	98.00	2.00	A	.09
						(0.12)
165	L 330	.5	94.70	5.30	C	.05
171	L 339	6.1	94.40	5.60	A	.08
173	L 505	30.2	96.20	3.80	O	.04
	506	1.7	97.20	2.80	F	.34
						(0.19)
174	L 215	31.2	80.30	19.70	D	.24
	216	19.1	77.00	23.00	D	.09
	217	14.0	96.10	3.90	F	.06
	218	27.7	91.00	9.00	F	.26
	219	26.8	90.00	10.00	A	.10
	220	8.2	91.70	8.30	D	.05
	221	11.3	95.19	4.81	D	.28
	222	25.4	85.90	14.10	A	.14
	223	14.0	98.75	1.25	O	.12
	224	17.1	98.30	1.70	F	.10
						(0.14)
175	L 743	13.6	84.54	15.46	O	.25
	744	24.8	91.20	8.80	O	.44
						(0.35)
177	L 349	8.7	89.30	10.70	O	.01
	350	13.2	95.40	4.60	D	.03
	351	14.3	93.00	7.00	A	.66
	352	15.6	78.50	21.50	F	.14
						(0.21)



Table 13.--Miscellaneous data obtained from the grain-size and mineralogical studies of 266 sandstone samples from the Salt Wash Member of the Morrison Formation--Continued

Map location	Sample No.	Components by weight (in percent)			Barite	Total heavy minerals in percent of detrital fraction (excluding barite)
		Acid solubles	Sand	Fines		
178	L 158	24.7	92.20	7.80	C	0.57
	159	15.8	98.20	1.80	A	.64
	160	20.5	96.00	4.00	F	1.30
	227	8.6	95.74	4.26	D	.15
	228	10.1	91.80	8.20	F	.05
	229	28.7	96.60	3.40	F	.14
	231	14.4	91.80	8.20	A	.12
						(0.42)
179	L 329	1.4	99.38	.62	F	.02
	381	.6	98.95	1.05	F	.15
	383	7.1	87.91	12.09	D	.05
	384	14.8	90.00	10.00	D	.08
						(0.08)
181	L 615	3.1	85.90	14.10	A	.18
	616	7.7	91.50	8.50	O	.15
	617	13.3	92.80	7.20	C	.03
						(0.12)
182	L 1	19.0	89.80	10.20	D	.56
	2	1.2	99.63	.37	D	
	576	9.5	91.10	8.90	O	.09
	582	9.5	95.30	4.70	O	.50
	588	11.0	92.10	7.90	O	.84
						(0.50)
184	L 41	1.6	97.86	2.14	F	.18
	43	3.3	98.83	1.17	O	.30
						(0.24)
189	L 611	26.8	97.20	2.80	C	.07
	612	29.7	99.10	.90	O	.07
	613	20.3	98.60	1.40	O	.03
	614	1.2	97.60	2.40	O	.02
	820	19.7	95.40	4.60	O	.09
						(0.06)
194	L 340	12.8	90.80	9.20	F	.31
197	L 799	14.7	91.12	8.88	F	.14
	800	7.6	91.16	8.84	A	.05
	801	1.2	94.60	5.40	C	.14
						(0.11)

Table 13.--Miscellaneous data obtained from the grain-size and mineralogical studies of 266 sandstone samples from the Salt Wash Member of the Morrison Formation--Continued

Map location	Sample No.	Components by weight (in percent)			Barite	Total heavy minerals in percent of detrital fraction (excluding barite)
		Acid solubles	Sand	Fines		
199	L 621	6.9	94.30	5.70	0	0.13
	622	16.7	98.10	1.90	0	.07
	623	16.8	96.80	3.20	D	.19
	624	95.0	36.50	63.50	A	.02 (0.10)
200	L 55	9.8	91.47	8.53	F	.57
	56	27.3	73.46	26.54	C	.31
	57	12.2	96.66	3.34	A	.64
	58	6.2	95.42	4.58	C	.82
	59	2.0	92.99	7.01	C	.25
	60	6.2	95.33	4.67	D	.95 (0.59)
201	L 21	24.7	81.60	18.40	0	.36
	22	9.9	90.80	9.20	0	1.43
	23	2.2	90.27	9.73	0	.09 (0.63)
203	L 24	7.1	98.46	1.54	C	.10
	25	3.4	91.57	8.43	0	.18
	26	7.2	94.28	5.72	0	.32
	27	5.9	95.34	4.66	F	.20
	28	3.3	94.30	5.70	0	.99 (0.36)
208	L 400	10.7	94.70	5.30	0	.14
	401	25.3	96.90	3.10	D	.07
	402	23.4	95.20	4.80	D	.10 (0.10)
214	L 239	6.9	93.40	6.60	0	.87
	240	8.3	94.80	5.20	D	.56
	241	8.1	90.70	9.30	F	.14
	286	29.5	95.20	4.80	0	1.45 (0.76)
215	L 398	1.3	96.80	3.20	F	.02
	399	4.1	95.20	4.80	A	.32
	634	9.0	96.90	3.10	F	.06
	635	8.7	93.90	6.10	A	.14 (0.14)

Table 13.--Miscellaneous data obtained from the grain-size and mineralogical studies of 266 sandstone samples from the Salt Wash Member of the Morrison Formation--Continued

Map location	Sample No.	Components by weight (in percent)			Barite	Total heavy minerals in percent of detrital fraction (excluding barite)
		Acid solubles	Sand	Fines		
222	L 831	3.9	96.07	3.93	0	0.02
	832	.8	95.72	4.28	0	.17
	833	1.4	92.07	7.93	0	.15
						(0.11)
231	L 233	4.7	95.20	4.80	F	.22
	234	4.5	89.60	10.40	F	.19
	235	3.6	96.50	3.50	F	.29
	268	2.0	97.70	2.30	0	.26
	269	36.1	95.20	4.80	D	.94
	270	2.9	93.50	6.50	F	.14
	272	5.8	85.75	14.25	0	.43
	275	6.6	93.30	6.70	0	.12
						(0.32)
234	L 803	2.1	84.45	15.55	0	1.89
Grand mean						0.23

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Table 14.--Miscellaneous data obtained from the grain-size and mineralogical studies of 59 sandstone samples from the Recapture Member of the Morrison Formation

[Map location refers to sample locality number on plate 1 of Professional Paper 556. Values in parentheses are location averages (means). In barite column the symbols refer to the proportion of barite in the heavy-mineral suite: 0, absent, or less than 1 percent; C, common, about 1-5 percent; A, abundant, about 5-20 percent; D, dominant, more than any other mineral, about 20-50 percent; F, flood, more than all other minerals, about 50-100 percent]

Map location	Sample No.	Components by weight (in percent)			Barite	Total heavy minerals in percent of detrital fraction (excluding barite)
		Acid solubles	Sand	Fines		
7	L 565	1.9	97.70	2.30	0	0.10
	570	1.4	97.60	2.40	0	.29 (0.20)
28	L 392	1.4	95.90	4.10	0	.11
49	L 837	9.9	81.15	18.85	F	.21
	838	4.2	84.70	15.30	0	1.37
	839	4.6	96.50	3.50	0	.34 (0.64)
78	L 650	9.8	86.60	13.40	0	.28
	651	18.4	95.90	4.10	F	.38
	652	20.0	93.10	6.90	A	.30 (0.32)
79	L 767	3.1	93.88	6.12	0	.42
	768	1.6	96.35	3.65	A	.02
	769	1.4	96.29	3.71	0	.07
	770	14.6	96.15	3.85	0	.09 (0.15)
83	L 787	3.1	89.37	10.63	C	.74
	788	2.1	96.07	3.93	C	1.00
	789	1.2	95.44	4.56	A	1.02 (0.92)
92	L 781	12.0	96.45	3.55	A	.06
	782	10.4	96.93	3.07	C	.09
	783	24.7	96.61	3.39	C	.20 (0.12)

Table 14.--Miscellaneous data obtained from the grain-size and mineralogical studies of 59 sandstone samples from the Recapture Member of the Morrison Formation--Continued

Map location	Sample No.	Components by weight (in percent)			Barite	Total heavy minerals in percent of detrital fraction (excluding barite)
		Acid solubles	Sand	Fines		
114	L 707	0.9	95.26	4.74	0	0.14
	708	.3	97.70	2.30	C	.04
	709	17.2	86.93	13.07	A	.62
	710	89.9	91.20	8.80	C	.32 (0.28)
118	L 758	29.9	68.89	31.11	0	.24
	759	12.8	96.61	3.39	0	.24
	760	5.7	90.00	10.00	0	.18 (0.22)
124	L 192	6.36	96.50	3.50	A	.52
	193	4.68	92.20	7.80	A	.83
	194	4.50	89.20	10.80	C	.16 (0.50)
128	L 655	11.3	84.10	15.90	0	.67
	656	4.0	93.20	6.80	D	.65 (0.66)
135	L 320	12.69	95.00	5.00	F	.16
140	L 722	23.6	98.06	1.94	0	2.25
151	L 376	.7	96.80	3.20	0	.87
	720	3.3	97.80	2.20	0	1.42 (1.15)
163	L 206	3.27	97.80	2.20	0	.39
	207	2.14	96.40	3.60	0	.24
	209	9.20	96.20	3.80	0	.20 (0.28)
172	L 753	1.1	98.00	2.00	0	.05
	754	10.8	75.44	24.56	0	.28 (0.17)
175	L 745	2.2	91.56	8.44	0	1.17
	746	1.3	94.70	5.30	C	.89
	747	3.9	96.30	3.70	0	.24
	748	.8	95.87	4.13	0	.07 (0.59)
195	L 714	2.5	80.61	19.39	0	.21
207	L 771	17.6	88.90	11.10	0	.61
	772	3.9	95.39	4.61	A	.23
	776	1.4	91.67	8.33	0	.26 (0.37)

Table 14.--Miscellaneous data obtained from the grain-size and mineralogical studies of 59 sandstone samples from the Recapture Member of the Morrison Formation--Continued

Map location	Sample No.	Components by weight (in percent)			Barite	Total heavy minerals in percent of detrital fraction (excluding barite)
		Acid solubles	Sand	Fines		
209	L 638	1.1	95.90	4.10	0	0.74
	639	14.9	91.20	8.80	0	.32
	640	2.4	93.00	7.00	0	.03
						(0.36)
210	L 643	1.9	94.40	5.60	0	1.72
	742	2.9	77.20	22.80	0	1.02
						(1.37)
230	L 618	1.8	95.80	4.20	0	.12
	619	1.7	98.20	1.80	0	.14
	620	3.3	93.40	6.60	0	.32
	702	2.2	92.10	7.90	0	.22
	703	2.1	93.20	6.80	0	.16
	706	.1	93.00	7.00	0	.08
						(0.17)

Grand  
mean 0.44

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Table 15.--Miscellaneous data obtained from the grain-size and mineralogical studies of 59 sandstone samples from the Westwater Canyon Member of the Morrison Formation

[Map location refers to sample locality number on plate 1 of Professional Paper 556. Values in parentheses are location averages (means). In barite column the symbols refer to the proportion of barite in the heavy-mineral suite: 0, absent, or less than 1 percent; C, common, about 1-5 percent; A, abundant, about 5-20 percent; D, dominant, more than any other mineral, about 20-50 percent; F, flood, more than all other minerals, about 50-100 percent]

Map location	Sample No.	Components by weight (in percent)			Barite	Total heavy minerals in percent of detrital fraction (excluding barite)
		Acid solubles	Sand	Fines		
7	L 566	4.0	94.20	5.80	A	0.15
	571	3.3	97.70	2.30	A	.14 (0.15)
28	L 371	3.7	95.47	4.53	0	.13
	372	4.9	97.00	3.00	0	.17
	373	3.1	97.30	2.70	0	.17 (0.16)
30	L 327	2.8	4.00	96.00	0	.41
49	L 725	2.0	93.50	6.50	0	1.72
	726	2.2	91.90	8.10	0	.12
	840	4.8	92.50	7.50	0	.07 (0.64)
78	L 647	2.4	91.10	8.90	A	.09
	648	1.7	92.80	7.20	A	.05
	649	4.0	90.30	9.70	0	.17 (0.10)
79	L 777	2.4	93.58	6.42	0	.21
	778	2.2	91.20	8.80	A	.10 (0.16)
83	L 790	5.2	92.25	7.75	A	.85
	791	2.0	97.30	2.70	A	.73
	792	12.0	94.69	5.31	F	.77 (0.78)
92	L 784	2.3	93.52	6.48	A	.07
	785	1.3	93.51	6.49	A	.07
	786	1.6	94.01	5.99	0	.67 (0.27)

Table 15.--Miscellaneous data obtained from the grain-size and mineralogical studies of 59 sandstone samples from the Westwater Canyon Member of the Morrison Formation--Continued

Map location	Sample No.	Components by weight (in percent)			Barite	Total heavy minerals in percent of detrital fraction (excluding barite)
		Acid solubles	Sand	Fines		
114	L 863	1.9	86.53	13.47	0	1.37
118	L 761	4.0	90.00	10.00	0	.25
	762	1.1	95.80	4.20	0	.07
	763	2.1	96.20	3.80	0	.05
						(0.12)
124	L 195	4.0	96.00	4.00	A	.61
	196	6.1	92.70	7.30	D	.35
	197	9.9	86.90	13.10	F	.48
						(0.48)
128	L 653	2.1	94.70	5.30	C	.21
	654	2.3	95.20	4.80	0	.13
						(0.17)
135	L 319	2.8	96.00	4.00	C	.03
140	L 721	5.5	92.10	7.90	0	.16
151	L 374	.6	98.58	1.42	0	.59
	375	1.0	96.00	4.00	0	.04
	716	.8	96.80	3.20	D	.24
	717	1.8	98.10	1.90	0	.18
						(0.26)
163	L 208	9.2	96.80	3.20	0	.11
	210	3.1	97.72	2.28	0	1.18
						(0.65)
172	L 711	3.0	83.75	16.25	A	4.10
	712	1.12	95.22	4.78	0	2.29
	713	.98	93.75	6.25	0	1.32
						(2.57)
175	L 749	.5	94.57	5.43	0	.04
	750	1.0	96.23	3.77	0	.03
	751	1.1	95.32	4.68	0	.03
	752	.5	94.80	5.20	0	.07
						(0.04)
195	L 715	.2	93.53	6.47	C	.17
	727	6.4	93.08	6.92	0	1.30
						(0.74)
207	L 773	2.5	95.52	4.48	0	.09
	774	1.6	95.78	4.22	0	.22
	775	1.4	94.05	5.95	0	.39
						(0.23)

Table 15.--Miscellaneous data obtained from the grain-size and mineralogical studies of 59 sandstone samples from the Westwater Canyon Member of the Morrison Formation--Continued

Map location	Sample No.	Components by weight (in percent)			Barite	Total heavy minerals in percent of detrital fraction (excluding barite)
		Acid solubles	Sand	Fines		
209	L 641	3.1	91.30	8.70	0	0.08
	642	3.9	92.10	7.90	C	.05 (0.07)
210	L 644	13.8	92.90	7.10	0	2.00
	645	1.1	94.50	5.50	0	.15
	646	4.9	86.80	13.20	0	.17 (0.77)
215	L 395	4.0	93.50	6.50	A	.56
	396	12.6	85.75	14.25	D	1.08
	397	8.4	96.50	3.50	F	.33 (0.66)
230	L 704	.2	93.30	6.70	0	.09
	705	1.3	91.90	8.10	0	.10 (0.10)
Grand mean						0.47

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Table 16.--Miscellaneous data obtained from the grain-size and mineralogical studies of 53 sandstone samples from the Brushy Basin Member of the Morrison Formation

[Map location refers to sample locality number on plate 1 of Professional Paper 556. Values in parentheses are location averages (means). In barite column the symbols refer to the proportion of barite in the heavy-mineral suite: 0, absent, or less than 1 percent; C, common, about 1-5 percent; A, abundant, about 5-20 percent; D, dominant, more than any other mineral, about 20-50 percent; F, flood, more than all other minerals, about 50-100 percent]

Map location	Sample No.	Components by weight (in percent)			Barite	Total heavy minerals in percent of detrital fraction (excluding barite)
		Acid solubles	Sand	Fines		
7	L 568	8.1	78.80	21.20	A	0.04
	569	22.0	98.00	2.00	A	.10 (0.07)
24	L 674	28.48	87.30	12.70	A	.03
28	L 370	15.4	88.30	11.70	A	.12
31	L 694	4.4	95.40	4.60	F	.01
	695	17.4	93.89	6.11	C	.03 (0.02)
37	L 698	18.5	97.80	2.20	F	1.24
56	L 89	4.6	98.31	1.69	0	2.23
59	L 672	8.38	87.81	12.19	F	.66
61	L 136	12.0	83.07	16.93	F	.35
	1494	5.6	79.60	20.40	0	.02
	137	5.8	92.23	7.77	F	.30 (0.22)
64	L 413	24.7	87.30	12.70	A	.38
	414	5.4	91.76	8.24	0	.87
	415	5.3	95.43	4.57	0	.05
	416	1.6	98.20	1.80	F	.13 (0.36)
71	L 3776	1.8	95.14	4.86	0	.05
	3777	1.5	95.95	4.05	D	.21 (0.13)
73	L 815	31.6	84.50	15.50	0	.50
86	L 687	2.5	91.79	8.21	0	.27
88	L 853	6.4	94.51	5.49	0	.03
99	L 979	2.1	96.00	4.00	A	.36
112	L 678	12.86	98.08	1.92	0	.04
	680	1.52	95.00	5.00	0	.05 (0.05)
115	L 3450	37.3	94.75	5.25	D	.68

Table 16.--Miscellaneous data obtained from the grain-size and mineralogical studies of 53 sandstone samples from the Brushy Basin Member of the Morrison Formation--Continued

Map location	Sample No.	Components by weight (in percent)			Barite	Total heavy minerals in percent of detrital fraction (excluding barite)
		Acid solubles	Sand	Fines		
130	L 664	4.6	97.10	2.90	A	0.10
136-B	L 338	11.4	92.98	7.02	F	.11
142	L 387	16.3	90.97	9.03	F	.16
146	L 665	17.3	76.50	23.50	O	.20
	666	30.3	84.33	15.67	F	.07 (0.14)
159	L 734	8.0	97.20	2.80	O	.07
	735	4.6	93.10	6.90	O	.09 (0.08)
161	L 682	21.01	96.30	3.70	A	.09
173	L 507	28.3	94.70	5.30	D	.15
	676	32.6	87.40	12.60	C	.38 (0.27)
174	L 211	1.8	95.60	4.40	O	.37
	212	15.0	80.40	19.60	A	.15
	213	4.7	95.00	5.00	O	.14
	157	29.0	76.10	23.90	F	.23
	214	36.3	98.37	1.63	A	1.10 (0.40)
177	L 528	5.8	83.30	16.70	D	.34
	529	41.7	48.80	51.20	C	.08 (0.21)
178	L 225	8.6	10.70	89.30	D	.07
181	L 688	18.8	92.36	7.64	O	.23
189	L 685	1.6	94.96	5.04	A	.01
	686	1.5	96.69	3.31	O	.03 (0.02)
199	L 684	21.86	95.68	4.32	O	.63
208	L 409	15.0	96.00	4.00	F	.01
	412	4.0	73.40	26.60	O	.21 (0.11)
214	L 243	5.4	90.60	9.40	D	.42
	244	12.4	91.77	8.23	F	.45
	245	6.4	93.10	6.90	O	1.53 (0.80)
221	L 2317	.4	94.95	5.05	C	.75
Grand mean						0.32

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