

Supplementary Table S1. The ICP-MS U-Pb test data was performed on two sandstone samples collected from the DGS-02 and DGS-026 of the Dagushi Formation in the Jiyuan area.

DGS-02 (Zircon U-Pb)

Contents (ESIS)	207Pb/206Pb	207Pb/206Pb	207Pb/235U	207Pb/235U	206Pb/238U	206Pb/238U	Concordance	Th/U
Sample	Age (Ma)	1sigma	Age (Ma)	1sigma	Age (Ma)	1sigma		
DGS-02-01	2540	45.37	2472	25.53433663	2390	24.82170289	96%	0.793855247
DGS-02-02	1829	50	1773	23.42192772	1723	14.69071439	97%	0.861794411
DGS-02-03	2721	33.9525	2733	20.12016158	2746	19.88605932	99%	0.584427335
DGS-02-04	2543	29.63	2553	17.49762011	2563	16.81675264	99%	0.496200637
DGS-02-05	2155	34.26	2151	17.75133206	2145	13.84785481	99%	0.483815555
DGS-02-06	1909	32.8725	1833	16.64787221	1762	14.58252168	96%	0.961958795
DGS-02-07	1917	33.4875	1936	16.75132851	1953	13.52756469	99%	0.779435868
DGS-02-08	2310	30.405	2323	17.01495294	2334	17.31077952	99%	0.524522937
DGS-02-09	1924	31.485	1906	15.25215187	1888	12.76644723	99%	0.85299064
DGS-02-10	2039	28.545	1993	16.92541915	1944	18.01995527	97%	0.595129917
DGS-02-11	2177	26.5425	2165	13.45251606	2148	12.70793202	99%	0.516812123
DGS-02-12	1922	31.33	1919	14.58747706	1920	12.28545889	99%	0.890422998
DGS-02-13	1789	38.89	1766	17.58662232	1749	12.39928892	99%	0.589059401
DGS-02-14	2479	33.335	2495	18.11784895	2503	16.94136552	99%	0.438803552
DGS-02-15	2188	39.8175	2168	17.86919943	2136	13.91790241	98%	0.646346145
DGS-02-16	1906	35.1875	1918	15.76524667	1924	13.02428152	99%	0.692765578
DGS-02-17	2169	34.875	2166	17.53356504	2156	14.2401296	99%	0.45512287
DGS-02-18	1916	33.18	1922	15.82711138	1921	14.09689064	99%	1.022446219
DGS-02-19	1784	42.5925	1788	19.13205175	1786	14.99704478	99%	0.721702358
DGS-02-20	2161	31.79	2070	17.49504129	1970	17.30412607	95%	0.547130898
DGS-02-21	1899	68.83	1818	14.83162588	1740	12.15500993	95%	0.754115237
DGS-02-22	2103	33.0275	2091	17.47719528	2068	16.12211472	98%	0.504325532
DGS-02-23	2189	29.94	2197	15.90695102	2198	15.79125461	99%	0.572119324
DGS-02-24	1909	31.79	1892	16.31495915	1870	15.42785805	98%	0.853524812
DGS-02-25	1931	33.18	1899	15.64876269	1862	11.43088949	97%	0.86003147
DGS-02-26	2128	42.595	2090	16.02873684	2048	13.21466982	97%	0.68877294
DGS-02-27	1894	35.805	1886	16.82406762	1873	14.90596422	99%	0.892034999
DGS-02-28	1891	36.575	1892	16.81955708	1884	12.69847991	99%	0.635758828
DGS-02-29	2144	33.6425	2136	16.70282486	2119	13.38158788	99%	0.599988668
DGS-02-30	1817	29.785	1667	13.34402467	1545	11.37324152	92%	0.620998375
DGS-02-31	2100	28.5525	2120	16.51135261	2141	20.97072544	99%	0.522419672
DGS-02-32	1854	41.6675	1878	16.86626036	1891	12.46682211	99%	1.007024965
DGS-02-33	1843	37.1925	1894	17.498802	1930	14.6576566	98%	0.912515858
DGS-02-34	1813	29.475	1832	16.24514636	1836	13.09152284	99%	0.799149294
DGS-02-35	1828	35.1875	1838	16.0917241	1837	12.04934941	99%	0.852088679
DGS-02-36	1833	40.7425	1862	18.44300798	1889	13.66005785	98%	1.075397445
DGS-02-37	1865	35.0325	1869	16.9631807	1866	15.93152065	99%	0.999460859
DGS-02-38	1806	30.865	1772	14.15723065	1738	12.88884485	98%	0.845772782

DGS-02-39	2135	30.3975	2154	15.46366766	2165	14.37278549	99%	0.596023488
DGS-02-40	2137	31.3275	2134	16.22323357	2123	14.03685746	99%	0.67757441
DGS-02-41	1861	34.4175	1812	17.24346448	1762	15.78279215	97%	0.699742719
DGS-02-42	2139	33.1825	2135	16.49422713	2128	16.86272698	99%	0.57346718
DGS-02-43	2144	29.6325	2141	14.71933883	2133	13.52129471	99%	0.861377613
DGS-02-44	2080	31.0225	2104	15.64012869	2122	13.09304481	99%	0.535472068
DGS-02-45	1933	33.33	1825	15.28885735	1782	9.772537655	97%	1.403064577
DGS-02-46	1879	35.49	1880	16.43194287	1875	11.89829298	99%	0.823143282
DGS-02-47	1922	32.1	1888	15.56485994	1861	12.88673372	98%	0.850400583
DGS-02-48	2054	34.26	2050	16.93769629	2044	14.99016598	99%	0.30639854
DGS-02-49	1902	37.81	1929	15.66897407	1953	14.49097177	98%	0.79991498
DGS-02-50	2161	29.0125	2160	15.52959674	2153	13.47533643	99%	0.585969666
DGS-02-51	1887	33.485	1859	16.36821204	1830	12.91134432	98%	0.847549154
DGS-02-52	2124	35.185	2138	18.09508	2150	15.10889634	99%	0.655301489
DGS-02-53	2107	35.1875	1971	18.05583343	1840	11.60984639	93%	0.577296124
DGS-02-54	1902	37.0375	1928	18.3000721	1950	13.65323835	98%	1.05431365
DGS-02-55	2167	35.185	2178	17.66851663	2202	14.76637357	98%	0.489833889
DGS-02-56	2189	33.0275	2191	16.81807373	2193	14.91886009	99%	0.642913749
DGS-02-57	2172	35.34	2133	15.66020903	2091	12.86180142	98%	0.565715757
DGS-02-58	1922	35.8025	1897	17.67419734	1879	16.92509318	99%	0.979029102
DGS-02-59	1906	33.335	1892	15.74602935	1876	11.93483174	99%	0.915419849
DGS-02-60	1855	31.33	1876	15.60104209	1888	16.05853676	99%	1.342520639
DGS-02-61	1931	37.0375	1936	17.29947174	1939	13.60350561	99%	1.182890143
DGS-02-62	1902	28.5525	1919	13.9249166	1930	12.37086247	99%	1.00864872
DGS-02-63	2150	34.26	2142	14.66665568	2129	12.83553637	99%	0.889620286
DGS-02-64	1883	34.565	1863	15.82595902	1840	11.14949154	98%	1.158330528
DGS-02-65	2072	49.23	2038	17.89522364	2003	16.83613243	98%	0.761007252
DGS-02-66	2109	29.63	2073	18.7043182	2030	24.73891444	97%	0.650027272
DGS-02-67	1913	36.2675	1952	17.36396436	1984	16.00654409	98%	0.953474501
DGS-02-68	1944	28.5525	1927	13.98171139	1915	11.8874002	99%	0.907808602
DGS-02-69	2202	30.0925	2197	15.987239	2182	12.41513703	99%	0.653002944
DGS-02-70	1910	37.5	1907	17.58108958	1899	12.72668188	99%	1.192003037
DGS-02-71	2214	30.5575	2199	18.16949748	2175	15.13505384	98%	0.55067934
DGS-02-72	2142	35.805	2120	18.00206766	2092	17.63583582	98%	0.157525928
DGS-02-73	2211	31.6375	2174	15.27029199	2129	12.49143988	97%	0.493367349
DGS-02-74	1967	31.635	1882	15.63230247	1807	13.40780742	95%	1.035173367
DGS-02-75	2209	28.0875	2180	15.17853475	2140	14.5630578	98%	0.536801963
DGS-02-76	1909	39.1975	1945	18.7527907	1973	14.66478355	98%	0.953855105
DGS-02-77	1981	35.1825	1939	16.61291863	1892	11.65672002	97%	0.532817662
DGS-02-78	2387	34.565	2303	17.54794378	2202	14.41095477	95%	0.65793913
DGS-02-79	2203	37.04	2225	19.72083274	2239	18.55057829	99%	0.618398926
DGS-02-80	1913	36.575	1914	17.26137317	1907	12.61628119	99%	1.002320146
DGS-02-81	2098	32.565	2127	21.90141051	2139	28.43876803	99%	0.364468742

DGS-02-82	1898	31.02	1911	15.17976818	1915	14.13607908	99%	0.948352727
DGS-02-83	2152	27.935	2137	14.60829979	2111	12.44039768	98%	0.659820165
DGS-02-84	1943	41.205	1913	16.43956203	1881	13.13910141	98%	1.092268714
DGS-02-85	2313	32.565	2310	16.79758295	2296	14.92241672	99%	0.747434776
DGS-02-86	1858	37.195	1753	15.93209133	1658	14.39318422	94%	0.535286059
DGS-02-87	1856	34.7225	1899	16.36012322	1940	12.85772201	97%	1.098171514

DGS-026 (Zircon U-Pb)

Contents (ESIS)	207Pb/206Pb	207Pb/206Pb	207Pb/235U	207Pb/235U	206Pb/238U	206Pb/238U	Concordance	Th/U
Sample	Age (Ma)	1sigma	Age (Ma)	1sigma	Age (Ma)	1sigma		
DGS-026-01	2098	42.7475	2087	20.93798976	2072	16.24514421	99%	0.447307426
DGS-026-02	2298	31.3275	2317	17.09100595	2333	19.08098922	99%	0.990825094
DGS-026-03	2509	59.415	2471	14.6083618	2418	13.34925436	97%	0.204215725
DGS-026-04	2172	35.65	2184	15.29872059	2196	14.90601481	99%	0.473775099
DGS-026-05	1832	33.7975	1854	16.50992009	1869	15.94294858	99%	0.900920052
DGS-026-06	2492	29.6325	2501	17.29505438	2508	19.1765303	99%	0.459377011
DGS-026-07	2724	29.7875	2716	18.21883978	2702	19.17808679	99%	0.363965967
DGS-026-08	2127	40.8925	2158	20.62508608	2190	17.04850385	98%	0.522022818
DGS-026-09	2032	33.33	2043	17.13790806	2052	15.86474819	99%	0.070118145
DGS-026-10	2755	27.775	2761	17.39566854	2763	18.83154383	99%	1.220724459
DGS-026-11	2322	31.1775	2346	16.22380075	2386	19.96475436	98%	0.632987542
DGS-026-12	2479	28.09	2520	16.02153473	2565	18.66463182	98%	0.572574458
DGS-026-13	2302	28.3975	2295	17.70647598	2283	24.67398073	99%	0.426483093
DGS-026-14	2644	31.64	2669	17.77394425	2691	17.49356549	99%	0.499806864
DGS-026-15	2724	28.86	2723	19.19008826	2715	20.29594285	99%	0.879517973
DGS-026-16	2124	29.4725	2077	16.70410395	2021	19.74595165	97%	0.450328092
DGS-026-17	2483	28.705	2504	15.37452487	2523	16.040057	99%	0.519695518
DGS-026-18	2161	28.3975	2180	14.43747237	2194	14.98961787	99%	0.569225327
DGS-026-19	1921	39.815	1914	17.06996971	1902	15.72777503	99%	1.114503867
DGS-026-20	2183	31.1725	2186	16.49427071	2181	17.24198474	99%	0.461893877
DGS-026-21	2210	33.3325	2208	17.84909504	2196	16.65455781	99%	0.610974334
DGS-026-22	2702	28.5525	2723	16.9942331	2740	18.83826281	99%	0.576677456
DGS-026-23	2120	38.89	2039	19.34719181	1959	19.33104715	95%	0.456665946
DGS-026-24	2709	30.56	2692	17.10437647	2662	16.86845356	98%	0.695264276
DGS-026-25	2850	37.04	2849	22.56493286	2845	21.42503296	99%	0.296261254
DGS-026-26	2548	29.3225	2511	15.90698732	2455	12.87716041	97%	0.377424715
DGS-026-27	2196	33.025	2213	17.11011474	2221	16.73787346	99%	0.374476641
DGS-026-28	2269	30.4	2282	16.27159969	2291	15.04903273	99%	0.770195477
DGS-026-29	2146	37.1925	2009	17.74447615	1870	13.78075623	92%	0.612008428
DGS-026-30	2492	29.94	2354	16.25555266	2188	14.9053529	92%	0.454766107
DGS-026-31	2663	27.775	2592	15.98833862	2490	16.28252007	95%	0.505638771
DGS-026-32	1921	30.56	1835	13.99226782	1754	10.59519772	95%	0.706143172
DGS-026-33	2169	30.4025	2149	15.60873801	2120	12.97047412	98%	0.50458477

DGS-026-34	2573	32.5625	2522	17.96070755	2450	15.41269043	97%	0.759810013
DGS-026-35	2724	38.2725	2709	22.67278578	2679	19.13832077	98%	0.518217257
DGS-026-36	2087	33.025	2131	17.14323902	2172	15.41253442	98%	0.543317353
DGS-026-37	2694	35.495	2709	20.18805614	2727	16.70487888	99%	0.226731709
DGS-026-38	2170	31.3275	2172	16.91887065	2169	15.45214537	99%	0.674456414
DGS-026-39	2656	27.78	2642	16.47499109	2630	16.42013465	99%	0.595099928
DGS-026-40	2732	25.9275	2744	16.13176028	2752	18.41729328	99%	0.677881293
DGS-026-41	2272	29.4725	2098	16.1957872	1919	11.98267508	91%	0.441430254
DGS-026-42	2187	33.645	2202	18.15879566	2216	15.31345321	99%	0.634896943
DGS-026-43	2124	31.48	2071	16.4880144	2014	13.76717976	97%	0.460746884
DGS-026-44	1924	39.045	1939	16.9076567	1948	14.48482396	99%	0.818173703
DGS-026-45	2117	29.4725	2148	15.5472708	2172	13.74672208	98%	0.420268428
DGS-026-46	2140	37.655	2140	19.5173168	2136	14.23019177	99%	0.465786759
DGS-026-47	1937	31.635	1750	14.57090991	1593	11.37674572	90%	0.500380757
DGS-026-48	2095	30.245	2111	15.42131275	2119	14.37106157	99%	0.42403903
DGS-026-49	2494	31.79	2506	17.41577417	2511	15.3869008	99%	0.621986457
DGS-026-50	2176	36.11	2192	19.15522836	2199	18.25762138	99%	0.630453295
DGS-026-51	2254	35.9575	2214	18.85852279	2162	16.19957362	97%	0.657818195
DGS-026-52	2092	32.72	2005	16.43837985	1913	14.01795944	95%	0.573645479
DGS-026-53	2548	29.3225	2545	19.06508343	2526	22.96404142	99%	0.380741664
DGS-026-54	2120	33.1775	2149	16.70254947	2174	14.29604331	98%	0.489570095
DGS-026-55	2096	31.3275	2083	14.72074346	2062	11.61788839	99%	0.439680581
DGS-026-56	2652	23.61	2671	16.24630802	2688	15.41140858	99%	0.982848726
DGS-026-57	2124	33.3325	2124	16.76276778	2120	15.74125823	99%	0.542499704
DGS-026-58	2167	31.33	2160	15.39018071	2161	14.59477336	99%	0.578274686
DGS-026-59	2187	33.49	2212	16.7926859	2235	17.21338871	98%	0.597733826
DGS-026-60	2706	28.55	2716	16.55103946	2728	16.92430941	99%	0.658068601
DGS-026-61	2198	33.1825	2192	17.81442139	2181	15.13382091	99%	0.552921471
DGS-026-62	2506	33.95	2545	20.84583454	2592	27.88464164	98%	0.761141926
DGS-026-63	2547	37.5025	2568	18.83849754	2590	20.62562524	99%	0.440478629
DGS-026-64	2150	33.335	2165	17.37823684	2180	17.12545882	99%	0.513412246
DGS-026-65	2542	32.1	2525	17.72140105	2502	16.71063224	99%	0.585657163
DGS-026-66	2531	28.0875	2581	17.08665503	2637	18.21472267	97%	0.43036316
DGS-026-67	2528	34.1025	2531	15.77821907	2531	15.72257791	99%	0.58962025
DGS-026-68	2254	30.8675	2264	16.29489097	2272	15.24580172	99%	0.685903864
DGS-026-69	2687	31.1725	2701	18.12029677	2716	19.94296555	99%	0.366418751
DGS-026-70	2157	37.1925	2141	19.83502953	2120	17.97779614	98%	0.617290749
DGS-026-71	2158	40.7425	2179	20.95433932	2197	18.4174377	99%	0.321407346
DGS-026-72	2524	37.1925	2541	21.56169009	2558	23.36664346	99%	0.778502181
DGS-026-73	2470	35.34	2514	20.71104899	2560	21.04661957	98%	0.425847284
DGS-026-74	2161	35.96	2158	19.64725494	2150	18.17495072	99%	0.702142121
DGS-026-75	2150	31.33	2149	18.7015461	2144	15.61529724	99%	0.600886794
DGS-026-76	2176	33.49	2198	17.56176423	2213	15.96893074	99%	0.523734056

DGS-026-77	2520	29.625	2503	16.40049745	2475	15.23735572	98%	0.435253364
DGS-026-78	2174	35.34	2191	18.63545154	2200	19.37787506	99%	0.528908084
DGS-026-79	2327	29.475	2345	15.78867971	2357	17.05153877	99%	0.66234384
DGS-026-80	2553	33.49	2571	18.6536014	2584	19.98769597	99%	0.403153462
DGS-026-81	2698	33.645	2620	18.71418351	2513	21.09001574	95%	0.560361576
DGS-026-82	2539	34.725	2529	17.98010705	2509	17.89190491	99%	0.713573074
DGS-026-83	2176	35.8025	2139	17.20272183	2094	13.76943056	97%	0.515650208
DGS-026-84	1913	47.685	1741	17.27565273	1591	12.79114125	91%	0.954906838
DGS-026-85	2600	37.035	2525	19.18314127	2506	18.58625911	99%	0.581599885
DGS-026-86	2194	32.255	2192	18.19600506	2185	16.83304625	99%	0.441492602
DGS-026-87	2207	31.325	2198	15.75153372	2177	13.20563085	99%	0.681069356
DGS-026-88	2739	27.3175	2731	14.94928873	2712	15.44747932	99%	0.537843613
DGS-026-89	2798	29.78	2789	14.25879535	2765	16.26809698	99%	0.519358917
DGS-026-90	2550	26.085	2559	14.41769299	2562	15.77411545	99%	0.471972953