

Tables

Table S1. Sample location and other pertinent information about the sample's characteristics.

Sample ID	Sample Set	Morphostratigraphic Age	Latitude	Longitude	Elevation (m asl)	Pressure Flag	Thickness (cm)	Density (g cm-3)	Shielding
GH13-01	1	Outer	63.162842	-135.777696	1407	std	2.5	2.67	0.98
GH13-02	1	Outer	63.162761	-135.777694	1409	std	2.5	2.67	0.98
GH13-03	1	Outer	63.162715	-135.777971	1408	std	2.5	2.67	0.98
GH13-04	2	Inner	63.147674	-135.762665	1619	std	2.5	2.67	0.99
GH13-05	2	Inner	63.148734	-135.762376	1609	std	2.5	2.67	0.99
GH13-06	2	Inner	63.14887	-135.76224	1607	std	2.5	2.67	0.99
GH13-07	3	Outer	63.112283	-135.793766	1408	std	2.5	2.67	1.00
GH13-08	3	Outer	63.112368	-135.794581	1404	std	2.5	2.67	1.00
15-GH01	4	Inner	63.12302	-135.745	1645	std	2.5	2.67	0.98
15-GH02	4	Inner	63.12285	-135.7451	1646	std	2.5	2.67	0.97
15-GH03	4	Inner	63.12203	-135.745	1643	std	2.5	2.67	0.97
15-GH04	5	Outer	63.17107	-135.57178	1376	std	2.5	2.67	0.99
15-GH05	5	Outer	63.17119	-135.57236	1374	std	2.5	2.67	1.00
15-GH06	5	Outer	63.17102	-135.57222	1375	std	2.5	2.67	1.00
15-GH07	6	Inner	63.14698	-135.61467	1594	std	2.5	2.67	0.99
15-GH08	6	Inner	63.14693	-135.61446	1593	std	2.5	2.67	0.99
15-GH09	6	Inner	63.14679	-135.61427	1591	std	2.5	2.67	0.99
15-GH10	7	Inner	63.04108	-135.53134	1655	std	2.5	2.67	0.99
15-GH11	7	Inner	63.041239	-135.532868	1650	std	2.5	2.67	0.97

15-GH12	7	Inner	63.041239	-135.532868	1650	std	2.5	2.67	1.00
15-GH13	8	Outer	63.178724	-135.859939	1381	std	2.5	2.67	1.00
15-GH14	8	Outer	63.17901	-135.8609	1376	std	2.5	2.67	1.00
15-GH15	8	Outer	63.17902	-135.86104	1374	std	2.5	2.67	0.99

Table S2. Be-10 geochemical information and resulting age. See text for scaling model and production rates used.

	Sample Set	Qtz Mass (g)	Be Carrier (mg Be)	$^{10}\text{Be}/^9\text{Be} \times 10^{-15} \pm 1\sigma$	Be-10 (atoms g ⁻¹)	±	Age (ka)	±	
	GH13-01	1	21.1067	0.2157	521.39±6.73	3.56E+05	5.90E+03	24.10	0.40
	GH13-02	1	20.322	0.2163	527.77±6.00	3.75E+05	5.78E+03	25.28	0.39
	GH13-03	1	20.857	0.2144	575.78±11.64	3.95E+05	8.98E+03	26.67	0.61
	GH13-04	2	20.53	0.2148	464.58±9.74	3.25E+05	7.61E+03	18.26	0.43
	GH13-05	2	22.186	0.2137	513.40±9.72	3.30E+05	7.14E+03	18.69	0.41
	GH13-06	2	20.319	0.2138	499.20±4.68	3.51E+05	4.92E+03	19.91	0.28
	GH13-07	3	20.533	0.2155	1165.32±19.75	8.17E+05	1.61E+04	54.73	1.09
	GH13-08	3	20.891	0.2143	506.59±9.82	3.47E+05	7.64E+03	23.14	0.51
Process Blank						$^{10}\text{Be} \pm 1\sigma$ (10⁴ atoms)			
	Blk11-11-14		0.214552	0.40±0.23	0.58±0.33				
	Sample Set	Qtz Mass (g)	Be Carrier (mg Be)	$^{10}\text{Be}/^9\text{Be} \times 10^{-15} \pm 1\sigma$	Be-10 (atoms g ⁻¹)	±	Age (ka)	±	
	15-GH01	4	10.0089	0.2601	183.31±5.31	3.21E+05	1.00E+04	17.92	0.56
	15-GH02	4	10.1416	0.2602	161.78±3.81	2.77E+05	7.20E+03	15.50	0.40
	15-GH03	4	10.1399	0.2601	153.90±4.45	2.63E+05	8.18E+03	14.76	0.46
	15-GH04	5	10.5538	0.2604	382.34±7.53	6.30E+05	1.42E+04	43.79	1.00
	15-GH05	5	9.9875	0.2603	76.97±3.02	1.33E+05	5.48E+03	9.03	0.37
	15-GH06	5	10.0526	0.2595	123.24±3.51	2.11E+05	6.65E+03	14.40	0.46
	15-GH07	6	9.9952	0.2606	168.45±3.66	2.92E+05	7.43E+03	16.71	0.43
	15-GH08	6	10.0271	0.2596	190.91±5.53	3.27E+05	1.03E+04	18.74	0.59
	15-GH09	6	10.0578	0.26	137.46±4.06	2.39E+05	7.86E+03	13.80	0.46
Process Blank						$^{10}\text{Be} \pm 1\sigma$ (10⁴ atoms)			

Blk061116			0.260416	0.75±0.26	0.13±0.04			
	Sample Set	Qtz Mass (g)	Be Carrier (mg Be)	$^{10}\text{Be}/^9\text{Be} \times 10^{-15} \pm 1\sigma$	Be-10 (atoms g⁻¹)	±	Age (ka)	±
15-GH10	7	10.1069	0.2683	189.85±4.38	3.36E+05	8.46E+03	18.35	0.46
15-GH11	7	10.5828	0.268	258.92±4.82	4.03E+05	1.69E+04	22.54	0.95
15-GH12	7	10.2023	0.2662	170.03±3.90	3.00E+05	1.42E+04	16.32	0.78
15-GH13	8	10.383	0.2692	347.51±5.45	5.90E+05	1.99E+04	40.27	1.37
15-GH14	8	10.1136	0.2688	272.73±5.22	4.60E+05	1.84E+04	31.57	1.27
15-GH15	8	10.1185	0.2704	323.00±5.25	5.64E+05	1.93E+04	39.14	1.35
Process Blank					$^{10}\text{Be} \pm 1\sigma$ (10⁴ atoms)			
BAB111816			0.269048	0.28±0.14	0.05±0.03			

Table S4. Summary statistics for the moraine sample sets.

Sample Set	Morphostratigraphic Age	¹⁰ Be Median Age	±	Std Error	¹⁴ C Median Age	±	Std Error
2	Inner	18686	413	2.21%	--	--	--
4	Inner	15495	790	5.10%	--	--	--
6	Inner	16710	1234	7.38%	--	--	--
7	Inner	18349	1555	8.48%	11241	114	1.01%
	<i>Group Median</i>	<i>17530</i>	<i>1014</i>	<i>5.78%</i>			--
1	Outer	25279	644	2.55%	--	--	--
3	Outer	38932	7897	20.28%	--	--	--
5	Outer	14403	8690	60.33%	9420	7134	75.73%
8	Outer	39140	2175	5.56%	6413	542	8.46%
	Group Median	<i>32105</i>	<i>8212</i>	<i>25.58%</i>			--