

Site no.	Sample no.	Rock type	Width (m)	Strike & dip of contact	Location	City/town	Geologic belt	North latitude	East longitude	Country rock
1	20171107L4-2	Porphyritic fine melo-quartz diorite	700	N42E, 64W	Shimonomata Forest Road	Iwaizumi	NK	39°46'23.55"	141°29'31.85"	Laminated mudstone
2	20171107L4-1	Porphyritic fine melo-quartz diorite	70	N4W, 80W	Shimonomata Forest Road	Iwaizumi	NK	39°46'21.45"	141°29'30.65"	Laminated mudstone
3	20171107L3-1	Hornblende andesite	100	N52E, 40W	Shimonomata Forest Road	Iwaizumi	NK	39°45'42.48"	141°29'52.48"	Chert
4	20171107L2	Dacite	200	-	Shimonomata Forest Road	Iwaizumi	NK	39°45'41.80"	141°29'55.10"	Chert
5a	20200724L1-1	Porphyritic fine quartz diorite	300	N46E, 78E	Okawa R.	Morioka	NK	39°44'45.50"	141°29'52.06"	Laminated mudstone
5b	20200724L1-2	Porphyritic fine quartz diorite	300	N44E, 88E	Okawa R.	Morioka	NK	39°44'45.31"	141°29'51.61"	Laminated mudstone
6	20171005L3	Quartz diorite	200	N30E, 82E	Ondoko S.	Iwaizumi	NK	39°44'23.59"	141°29'31.81"	Laminated mudstone
7	20210430L6	Porphyritic fine melo-quartz diorite	400	N12E, 72E	Kamishazamurai S.	Iwaizumi	NK	39°44'07.59"	141°30'08.03"	Laminated mudstone
8a	20171006L1	Quartz diorite	-	-	Ondoko S.	Iwaizumi	NK	39°43'43.33"	141°29'11.04"	-
8b	20171006L1.5	Quartz diorite	-	-	Ondoko S.	Iwaizumi	NK	39°43'40.03"	141°29'10.52"	Felsic tuff
9	20181018L3	Quartz diorite	1000	N10W, 88E	Tributary of Ondoko S.	Iwaizumi	NK	39°43'21.97"	141°28'50.08"	Laminated mudstone
10	20181018L4	Hornblende andesite	50	N10W, 72W	Tributary of Ondoko S.	Iwaizumi	NK	39°43'21.65"	141°28'48.00"	Chert
11	20161027L7-1	Porphyritic fine quartz diorite	220	N48E, 78E	Okawa R.	Iwaizumi	NK	39°44'47.95"	141°28'59.50"	Laminated mudstone
12a	20200724L3	Porphyritic fine tonalite	1000	N60E, 86W	Okawa R.	Morioka	NK	39°44'55.20"	141°28'52.17"	Laminated mudstone
12b	20200724L4	Porphyritic fine quartz diorite	1300	-	Okawa R.	Morioka	NK	39°44'52.83"	141°28'29.24"	Laminated mudstone
13	2020L1028L1	Porphyritic fine tonalite	300	-	Unnamed S. of the opposite side of Minaminosawa S.	Iwaizumi	NK	39°45'15.97"	141°28'19.65"	-
14	20171108L1	Porphyritic fine quartz diorite	600	N34E, 80W	Minaminosawa S.	Iwaizumi	NK	39°44'42.88"	141°28'01.36"	Laminated mudstone
15	20161029L1-2	Melo-quartz diorite	200	N62W, 72W	Hiegara S.	Iwaizumi	NK	39°43'52.91"	141°26'06.14"	Sandstone
16	20170822L2	Porphyritic fine melo-quartz diorite	300	N62E, 84W	Hiegara S.	Iwaizumi	NK	39°43'49.40"	141°25'51.30"	Interbedded mudstone/sandstone
17	20170822L3	Dacite	15	N86W, 78E	Hiegara S.	Iwaizumi	NK	39°43'44.13"	141°25'42.82"	Interbedded mudstone/sandstone
18	20161030L2	Dacite	1200	N46E, 80W	Okawa R.	Iwaizumi	NK	39°42'31.23"	141°27'00.23"	Between laminated mudstone and felsic tuff
19	20171109L1	Quartz diorite	500	N26E, 84W	Unnamed S. around Hitsutori	Iwaizumi	NK	39°42'15.12"	141°27'48.07"	Between basalt and chert
20	20161128L2	Rhyolite	300	-	Yonai R.	Morioka	NK	39°44'21.00"	141°20'23.43"	Chert
21	20201020L1	Porphyritic fine melo-quartz diorite	240	-	Tributary of Yonai R.	Morioka	NK	39°44'51.64"	141°20'56.75"	Chert
22	20161202L0.2	Hornblende andesite	400	N18E, 70E	Yonai R.	Morioka	NK	39°44'07.55"	141°18'17.53"	Laminated mudstone
23	20161123L4	Melo-quartz diorite	400	N32E, 88W	Yonai R.	Morioka	NK	39°44'18.73"	141°18'09.21"	Chert
24a	20161202L0.1	Porphyritic fine melo-quartz diorite	-	-	Yonai R.	Morioka	NK	39°44'05.43"	141°17'53.72"	-
24b	20161123L3	Porphyritic fine melo-quartz diorite	300	N36W, 78E	Yonai R.	Morioka	NK	39°44'09.16"	141°17'55.84"	Interbedded mudstone/sandstone
25	20161205L1	Porphyritic fine melo-quartz diorite	300	N26E, 36E	Nakadaisawa Forest Road	Morioka	NK	39°44'16.74"	141°17'55.35"	Laminated mudstone
26	20161205L2-3	Hornblende andesite	300	N12E, 60E	Nakadaisawa Forest Road	Morioka	NK	39°44'29.30"	141°17'54.05"	Felsic tuff
27	20161130L4	Hornblende andesite	520	N24E, 72E	Nakadaisawa Forest Road	Morioka	NK	39°44'32.03"	141°17'54.06"	Laminated mudstone
28	20190519L4	Hornblende andesite	-	-	Unnamed S. around former Oshida Station	Morioka	NK	39°44'06.65"	141°17'02.81"	Laminated mudstone
29	20161130L1	Hornblende andesite	200	N44E, 60W	Tatezawa Forest Road	Morioka	NK	39°44'28.76"	141°17'22.12"	Laminated mudstone
30	20161130L1.5	Hornblende andesite	200	N52W, 76E	Tatezawa Forest Road	Morioka	NK	39°44'30.81"	141°17'22.68"	Laminated mudstone
31	20161130L3	Porphyritic fine tonalite	200	-	Tatezawa Forest Road	Morioka	NK	39°44'32.03"	141°17'24.92"	Laminated mudstone
32	20161130L3.5	Hornblende andesite	300	N28W, 78E	Tatezawa Forest Road	Morioka	NK	39°44'51.47"	141°17'16.18"	Laminated mudstone
33	20181017L2	Porphyritic fine melo-quartz diorite	200	-	Tributary of Orikabe S.	Morioka	NK	39°45'10.21"	141°16'47.02"	Laminated mudstone
34	20161204L1	Rhyolite	400	N38E, 84E	Sotoyama R.	Morioka	NK	39°45'07.90"	141°15'57.18"	Chert
35	20171002L3	Porphyritic fine melo-quartz diorite	1500	-	Takinouchi S.	Morioka	NK	39°45'51.23"	141°16'15.25"	Between mudstone and chert
36	20171002L4.5	Porphyritic fine melo-quartz diorite	4000	-	Takinouchi S.	Morioka	NK	39°45'55.84"	141°16'16.06"	Chert
37	20171122L4	Porphyritic fine melo-quartz diorite	200	N36E, 74W	Abeta S.	Morioka	NK	39°46'38.41"	141°15'52.78"	Laminated mudstone
38	20180928L2.5	Hornblende andesite	-	-	Abeta S.	Morioka	NK	39°46'41.28"	141°15'59.76"	-
39a	20180928L2	Hornblende andesite	80	N54E, 80W	Abeta S.	Morioka	NK	39°46'38.94"	141°15'53.07"	Laminated mudstone
39b	20180928L1.5	Hornblende andesite	90	N54E, 86W	Abeta S.	Morioka	NK	39°46'40.10"	141°15'53.16"	Laminated mudstone
40	20161129L1	Porphyritic fine quartz diorite	200	N18W, 70E	Yonai R.	Morioka	NK	39°44'17.71"	141°14'57.39"	Laminated mudstone
41	20170330L0	Hornblende andesite	3000	-	Honoki S.	Morioka	NK	39°44'26.34"	141°14'57.09"	-
42	20181101L0	Hornblende andesite	200	-	Tributary of Kinemata S.	Morioka	NK	39°42'57.81"	141°21'42.66"	Chert
43	20171129L3	Quartz diorite	100	N2E, 80W	Unnamed S. around former Asagishi Station	Morioka	NK	39°42'16.88"	141°21'10.48"	Laminated mudstone
44	20171130L0	Rhyolite	200	N56E, 80W	Unnamed S. around former Asagishi Station	Morioka	NK	39°42'42.55"	141°20'30.03"	Chert
45	20170726L2	Porphyritic fine melo-quartz diorite	-	-	South of Kumanosawa Forest Road	Morioka	NK	39°43'15.10"	141°20'05.53"	-
46a	2020L117L1	Dacite	60	N44E, 86E	Unnamed S. of northeastward of Honda S.	Morioka	NK	39°42'01.30"	141°20'32.78"	Chert
46b	2020L117L2	Porphyritic fine tonalite	110	-	Unnamed S. of northeastward of Honda S.	Morioka	NK	39°42'00.59"	141°20'31.52"	-
46c	20210420L2	Porphyritic fine melo-quartz diorite	420	-	Unnamed S. of northeastward of Honda S.	Morioka	NK	39°42'05.55"	141°20'00.91"	-
47	20180523L2.5	Mega-porphyritic rhyolite	-	-	Kumanosawa S.	Morioka	NK	39°43'11.49"	141°19'09.03"	-
48a	20200725L1-1	Mega-porphyritic rhyolite	-	-	Nakatsu R.	Morioka	NK	39°43'28.31"	141°18'57.77"	Chert
48b	20180523L1	Mega-porphyritic rhyolite	6000	N34W, 86E	Kumanosawa S.	Morioka	NK	39°43'22.90"	141°18'59.87"	Chert
49a	20210421L5	Mega-porphyritic rhyolite	1000	-	Forest road along Kumanosawa S.	Morioka	NK	39°43'18.15"	141°19'15.33"	-
49b	20210421L4	Mega-porphyritic rhyolite	800	-	Forest road along Kumano S.	Morioka	NK	39°43'06.15"	141°19'35.97"	-
50a	20190717L9	Melo-quartz diorite	500	N52E, 84E	Nakatsu R.	Morioka	NK	39°43'06.78"	141°18'24.72"	Chert
50b	20200725L3	Melo-quartz diorite	300	-	Tributary of Nakatsu R. around Yagura	Morioka	NK	39°43'02.08"	141°18'23.40"	Chert
51	20210324L1	Hornblende andesite	120	N36E, 80W	Tributary of Nakatsu R. around Yagura	Morioka	NK	39°42'56.02"	141°18'28.35"	Laminated mudstone
52	20200324L3	Porphyritic fine melo-quartz diorite	-	-	Unnamed S. around Yagura	Morioka	NK	39°42'43.95"	141°18'16.89"	Laminated mudstone
53	20190717L1.5	Porphyritic fine melo-quartz diorite	600	N22E, 76E	Nakatsu R.	Morioka	NK	39°42'39.61"	141°17'50.90"	Laminated mudstone
54	20181101L2.5	Porphyritic fine melo-quartz diorite	-	-	Heirokuzawa Forest Road	Morioka	NK	39°43'04.48"	141°17'46.25"	-
55	19970815L6.1	Hornblende andesite	10	N32E, 70E	Yagurasawa Forest Road	Morioka	NK	39°42'22.48"	141°18'38.83"	Laminated mudstone
56	19970815L6.2	Porphyritic fine melo-quartz diorite	200	-	Yagurasawa Forest Road	Morioka	NK	39°42'22.48"	141°18'38.83"	Laminated mudstone
57	20180423L2.5	Porphyritic fine melo-quartz diorite	-	-	Unnamed S. around Yagura	Morioka	NK	39°41'57.57"	141°19'12.73"	-
58	20181116L3	Porphyritic fine tonalite	-	-	Uchisawa S. of Kamiyashiki	Morioka	ND	39°41'28.82"	141°19'17.54"	-
59	19970815L4	Dacite	100	N26W, 68W	Takayashiki Forest Road	Morioka	ND	39°41'36.73"	141°18'28.54"	-
60	20181114L5	Rhyolite	500	-	South forest road of Yagura S.	Morioka	ND	39°42'20.46"	141°17'52.95"	-
61	20190725L5.5	Porphyritic fine quartz diorite	200	N28W, 70W	Nakatsu R.	Morioka	ND	39°42'26.12"	141°16'33.05"	Between interbedded mudstone/sandstone and interbedded felsic tuff/mudstone
62	20190905L3.5	Hornblende andesite	200	N12E, 78E	Nakatsu R.	Morioka	ND	39°42'03.96"	141°14'57.14"	Meta-basalt
63	20190905L5	Hornblende andesite	700	N12W, 80W	Nakatsu R.	Morioka	ND	39°42'00.81"	141°14'58.11"	Meta-basalt
64	2020L1121L1	Porphyritic fine melo-quartz diorite	200	N20W, 76W	Unnamed S. of eastward of Gutori S.	Morioka	ND	39°41'49.04"	141°15'05.75"	Felsic tuff
65a	20190718L2.1	Rhyolite	100	N60W, 70W	Yanagawa R. of Mizusawa	Morioka	ND	39°40'26.85"	141°17'18.36"	Meta-basalt
65b	20190718L2.2	Rhyolite	100	N54W, 66W	Yanagawa R. of Mizusawa	Morioka	ND	39°40'26.87"	141°17'17.85"	Meta-basalt
65c	20190718L2.3	Rhyolite	400	N58W, 80W	Yanagawa R. of Mizusawa	Morioka	ND	39°40'27.32"	141°17'14.04"	Meta-basalt
66	20210423L2	Melo-quartz diorite	-	-	Nusuto S., tributary of Uchisawa S.	Morioka	ND	39°40'47.16"	141°19'11.06"	-
67	20050614L206	Dacite	30	-	Tateishi Forest Road	Morioka	ND	39°41'04.82"	141°17'46.04"	Mafic schist/mudstone

内野・羽地, Table A1 (Appendix)

**Laser ablation**

Model	CARBIDE (Light Conversion)
Laser type	Femtosecond laser
Pulse duration	224 fs
Wave length	257 nm
Energy density	3.2 J/cm <sup>2</sup>
Spot size	10 μm
Repetition rate	10 Hz
Duration of laser ablation	15 s
Carrier gas (He)	0.60 L/min

**ICP-MS**

Model	Nu Plasma II (Nu Instruments Ltd.)
ICP-MS type	Multi-collector
Forward power	1300 W
Make-up gas (Ar)	0.95 L/min
ThO <sup>+</sup> /Th (oxide ratio)	<1%
Data acquisition protocol	Time-resolved analysis
Data acquisition	24 s (12 s gas blank, 12 s ablation)
Monitor isotopes	<sup>202</sup> Hg, <sup>204</sup> Pb, <sup>206</sup> Pb, <sup>207</sup> Pb, <sup>208</sup> Pb, <sup>232</sup> Th, <sup>238</sup> U

**Standards**

Primary standard	Plešovice <sup>*1</sup>
Secondary standard	OD-3 <sup>*2, 3, 4</sup>

\*1: Sláma et al. (2008); \*2: Iwano et al. (2012); \*3: Iwano et al. (2013);

\*4: Lukács et al. (2015)

内野・羽地, Table A2 (Appendix)

Grain no.	Isotopic ratios				U-Pb age (Ma)				Th U	Remark		
	$\frac{^{207}\text{Pb}}{^{206}\text{Pb}}$	Error 2 $\sigma$	$\frac{^{206}\text{Pb}}{^{238}\text{U}}$	Error 2 $\sigma$	$\frac{^{207}\text{Pb}}{^{235}\text{U}}$	Error 2 $\sigma$	$\frac{^{206}\text{Pb}}{^{238}\text{U}}$	Error 2 $\sigma$				
1	0.0487	± 0.0054	0.0183	± 0.0008	0.1230	± 0.0141	117.0	± 5.3	117.7	± 12.8	0.38	
2	0.0517	± 0.0049	0.0187	± 0.0008	0.1332	± 0.0130	119.2	± 4.8	126.8	± 11.7	0.38	
3	0.0506	± 0.0044	0.0197	± 0.0007	0.1377	± 0.0125	126.0	± 4.7	130.8	± 11.3	0.39	
4	0.0501	± 0.0046	0.0189	± 0.0007	0.1304	± 0.0124	120.5	± 4.6	124.3	± 11.2	0.39	
5	0.0424	± 0.0044	0.0184	± 0.0007	0.1073	± 0.0115	117.4	± 4.7	103.4	± 10.6	0.52	
6	0.0519	± 0.0043	0.0182	± 0.0006	0.1301	± 0.0111	116.1	± 4.0	124.1	± 10.1	0.45	
7	0.1127	± 0.0032	0.3417	± 0.0087	5.3112	± 0.2006	1894.9	± 42.0	1870.5	± 33.4	0.28	
8	0.0458	± 0.0048	0.0184	± 0.0008	0.1166	± 0.0127	117.9	± 5.0	111.9	± 11.6	0.49	
9	0.0474	± 0.0030	0.0193	± 0.0005	0.1266	± 0.0084	123.5	± 3.2	120.9	± 7.6	0.41	
10	0.0488	± 0.0044	0.0189	± 0.0007	0.1274	± 0.0119	120.9	± 4.5	121.7	± 10.8	0.42	
11	0.0540	± 0.0046	0.0207	± 0.0008	0.1541	± 0.0137	132.0	± 5.0	145.4	± 12.1	0.39	
12	0.0511	± 0.0049	0.0187	± 0.0008	0.1315	± 0.0131	119.3	± 4.8	125.3	± 11.8	0.40	
13	0.0432	± 0.0038	0.0187	± 0.0006	0.1111	± 0.0100	119.3	± 4.1	106.9	± 9.2	0.45	
14	0.0505	± 0.0037	0.0186	± 0.0006	0.1299	± 0.0099	119.2	± 3.7	123.9	± 9.0	0.68	
15	0.0494	± 0.0050	0.0187	± 0.0008	0.1275	± 0.0133	119.7	± 5.0	121.7	± 12.0	0.42	
16	0.0486	± 0.0025	0.0218	± 0.0005	0.1463	± 0.0082	139.1	± 3.4	138.5	± 7.3	0.56	
17	0.0555	± 0.0055	0.0192	± 0.0009	0.1467	± 0.0151	122.4	± 5.5	138.8	± 13.4	0.36	
18	0.0392	± 0.0043	0.0185	± 0.0008	0.1002	± 0.0113	118.3	± 4.9	96.9	± 10.5	0.30	Disc.
19	0.0519	± 0.0043	0.0189	± 0.0007	0.1350	± 0.0117	120.5	± 4.4	128.4	± 10.5	0.41	
20	0.0489	± 0.0044	0.0189	± 0.0007	0.1277	± 0.0120	121.0	± 4.7	121.9	± 10.8	0.25	
21	0.0501	± 0.0042	0.0185	± 0.0007	0.1276	± 0.0111	118.0	± 4.3	121.8	± 10.1	0.26	
22	0.0436	± 0.0040	0.0211	± 0.0008	0.1269	± 0.0122	134.7	± 5.2	121.2	± 11.0	0.26	
23	0.0453	± 0.0044	0.0188	± 0.0008	0.1172	± 0.0118	120.0	± 4.8	112.4	± 10.8	0.36	
24	0.0502	± 0.0043	0.0188	± 0.0007	0.1303	± 0.0116	120.2	± 4.5	124.3	± 10.5	0.24	
25	0.0491	± 0.0044	0.0189	± 0.0007	0.1279	± 0.0121	120.8	± 4.7	122.1	± 10.9	0.28	
26	0.0466	± 0.0051	0.0191	± 0.0009	0.1225	± 0.0138	121.8	± 5.5	117.2	± 12.6	0.25	
27	0.0475	± 0.0031	0.0209	± 0.0006	0.1371	± 0.0096	133.5	± 3.9	130.3	± 8.6	0.63	
28	0.0468	± 0.0054	0.0186	± 0.0009	0.1200	± 0.0144	118.7	± 5.7	114.9	± 13.1	0.30	
29	0.0472	± 0.0018	0.0254	± 0.0005	0.1652	± 0.0070	161.7	± 3.1	155.2	± 6.1	0.43	
30	0.0501	± 0.0050	0.0187	± 0.0008	0.1291	± 0.0133	119.4	± 5.1	123.1	± 12.0	0.25	
OD3 5-3	0.0497	± 0.0036	0.0052	± 0.0001	0.0359	± 0.0026	33.7	± 0.8	35.7	± 2.6	2.36	2nd st.
OD3 5-4	0.0476	± 0.0033	0.0051	± 0.0001	0.0338	± 0.0023	33.2	± 0.7	33.7	± 2.3	1.61	2nd st.

内野・羽地, Table A3 (Appendix)