SUPPLEMENTARY TABLE 1. THE COMPOSITION OF OLIVINE, ORTHOPYROXENE AND CLINOPYROXENE IN OUR NORILSK SUITES

Olivine

#	borehole, depth	SiO_2	FeO	MnO	MgO	Total	Si	Fe	Mn	Mg	Σ	Fo	Fa	Tep
1	PL-39-538.7	38.57	24.69		36.71	99.97	1.01	0.54	0.00	1.44	1.98	72.6	27.4	0.0
2	PL-39-538.7	37.40	25.90	0.46	35.90	99.66	0.99	0.58	0.01	1.42	2.01	70.8	28.7	0.5
3	PL-40-549.8	35.98	35.74	0.76	26.67	99.15	1.01	0.84	0.02	1.12	1.98	56.6	42.5	0.9
4	PL-40-549.8	36.05	36.38	0.66	26.40	99.49	1.01	0.85	0.02	1.11	1.98	56.0	43.3	0.8
5	PL-40-549.8	35.79	36.70	0.68	26.80	99.97	1.00	0.86	0.02	1.12	1.99	56.1	43.1	0.8
6	PL-41-329.2	37.85	28.12		34.21	100.18	1.01	0.63	0.00	1.36	1.98	68.4	31.6	0.0
7	PL-42-331.5	37.57	23.74	0.34	35.80	97.45	1.01	0.53	0.01	1.44	1.98	72.6	27.0	0.4
8	PL-42-331.5	37.72	26.30	0.45	34.49	98.96	1.01	0.59	0.01	1.38	1.98	69.7	29.8	0.5
9	PL-39-351.4	37.66	26.74	0.30	35.30	100.00	1.00	0.59	0.01	1.40	2.00	69.9	29.7	0.3
10	WF-211-1411.7	38.79	20.88	0.30	39.87	99.84	1.00	0.45	0.01	1.54	1.99	77.0	22.6	0.3

Orthopyroxene

#	borehole, depth	SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Total
11	PL-39-538.7	55.02		0.23	16.69	0.62	26.57	0.85	99.98
12	PL-39-538.7	54.45		1.11	14.85	0.52	27.91	0.31	99.15
13	PL-39-538.7	56.31		0.60	15.19		29.14	0.32	101.56
14	PL-39-538.7	56.69		0.32	17.06	0.54	27.91	0.63	103.15
15	PL-39-538.7	54.96		0.57	16.44	0.46	26.68	1.23	100.34
16	PL-39-538.7	54.38		0.43	16.85	0.45	25.60	1.44	99.15
17	PL-39-538.7	53.74	0.40	0.83	15.45	0.57	26.37	1.69	99.05
18	PL-39-538.7	55.17		0.30	17.16		26.32	1.06	100.01
19	PL-40-556.3	55.43		0.30	18.36	0.53	25.95	1.16	101.73

20	PL-40-567.5	52.67			29.46	0.58	17.11	0.99	100.81
21	PL-40-573.1	52.68			23.84	0.59	21.21	1.76	100.08
22	PL-40-573.1	52.80		0.38	23.04	0.61	21.23	1.32	99.38
23	PL-40-573.1	51.11	0.32	0.45	23.45	0.53	19.32	1.40	96.58
24	PL-40-573.1	52.14		0.38	22.85	0.62	19.88	1.76	97.63
25	PL-40-573.1	50.53		0.25	26.03	0.56	17.58	1.39	96.34
26	PL-40-549.8	55.32	0.23		19.23	0.43	24.92	1.04	101.17
27	PL-40-549.8	55.32			16.06	0.54	27.63	0.45	100.00
28	PL-40-549.8	54.49	0.33		17.34	0.45	25.95	1.34	99.90
29	PL-41-214.5	54.00			20.31	0.75	23.80	1.04	99.90
30	PL-41-214.5	53.87			25.96	0.79	20.25	0.71	101.58
31	PL-41-322.3	54.64	0.40	1.64	13.59	0.39	28.31	1.05	100.02
32	PL-41-322.3	57.01			13.68	0.40	30.02	0.64	101.75
33	PL-41-329.2	55.71		1.04	17.30	0.46	26.37	0.73	101.61
34	PL-41-329.2	53.36	0.47	1.34	18.80	0.41	24.01	1.54	99.93
35	PL-42-331.5	54.62		0.28	15.17	0.61	26.02	1.33	98.03
36	PL-43-349.4	53.85	0.68	1.08	16.39		25.85	1.85	99.70
37	PL-39-351.4	54.54		1.02	15.86	0.37	27.44	0.90	100.13
38	PL-39-351.4	55.19		0.55	15.31	0.41	27.73	0.90	100.10
39	PL-39-351.4	55.49		0.47	15.28	0.48	27.23	1.22	100.17
40	PL-39-351.4	54.08	0.50	1.02	15.26		27.20	1.80	99.86
41	PL-39-351.4	53.72		0.83	16.94	0.49	25.21	1.11	98.30
42	PL-39-351.4	54.34		0.74	17.23	0.50	25.47	1.19	99.47
43	PL-39-351.4	54.15		0.66	15.64	0.35	26.48	0.71	97.99
44	PL-51-185.8	54.56		1.23	18.65	0.84	23.53	1.41	100.22
45	PL-51-185.8	53.68	0.25	0.26	19.41	0.56	23.75	1.30	99.21
46	WF-211-1411.7	55.52		1.17	14.90	0.66	28.32	0.49	101.06
47	WF-211-1411.7	56.41			15.41	0.44	27.83	0.76	100.85
48	WF-211-1416.9	56.35			15.27	0.44	27.98	1.19	101.23

#	Si	Ti	Al	Fe^{2+}	Mn	Mg	Ca	Σ	Wo	En	Fs	Mg#
11	2.00	0.000	0.01	0.51	0.019	1.44	0.03	2.00	1.7	72.0	26.3	73.2
12	1.97	0.000	0.05	0.44	0.016	1.51	0.01	1.97	0.6	75.9	23.5	76.9
13	1.98	0.000	0.02	0.44	0.000	1.53	0.01	1.98	0.6	76.9	22.5	77.6
14	1.99	0.000	0.01	0.49	0.016	1.46	0.02	1.99	1.2	73.0	25.8	74.3
15	1.98	0.000	0.02	0.49	0.014	1.44	0.05	1.98	2.4	72.0	25.6	74.1
16	1.99	0.000	0.02	0.52	0.014	1.40	0.06	1.99	2.8	70.4	26.7	72.2
17	1.96	0.011	0.04	0.45	0.018	1.44	0.07	1.97	3.3	72.1	24.6	75.3
18	2.00	0.000	0.01	0.54	0.000	1.42	0.04	2.00	2.1	71.7	26.2	72.6
19	1.99	0.000	0.01	0.54	0.016	1.39	0.04	1.99	2.2	69.4	28.4	71.4
20	2.02	0.000	0.00	0.98	0.019	0.98	0.04	2.02	2.1	49.3	48.6	49.4
21	1.98	0.000	0.00	0.70	0.019	1.19	0.07	1.98	3.5	58.6	37.9	62.2
22	1.99	0.000	0.02	0.72	0.019	1.19	0.05	1.99	2.7	59.9	37.4	61.6
23	2.00	0.009	0.02	0.81	0.018	1.13	0.06	2.01	3.0	57.2	39.8	57.8
24	2.01	0.000	0.02	0.77	0.020	1.14	0.07	2.01	3.7	57.9	38.4	59.0
25	2.01	0.000	0.01	0.89	0.019	1.04	0.06	2.01	3.0	52.5	44.5	53.4
26	2.01	0.006	0.00	0.61	0.013	1.35	0.04	2.01	2.0	67.9	30.1	68.3
27	2.00	0.000	0.00	0.48	0.016	1.49	0.02	2.00	0.9	74.1	25.0	75.1
28	1.99	0.009	0.00	0.52	0.014	1.41	0.05	2.00	2.6	70.3	27.1	72.6
29	2.00	0.000	0.00	0.62	0.023	1.31	0.04	2.00	2.1	65.4	32.5	67.1
30	2.01	0.000	0.00	0.83	0.025	1.13	0.03	2.01	1.4	56.6	42.0	56.8
31	1.95	0.011	0.07	0.40	0.012	1.51	0.04	1.96	2.0	76.7	21.3	78.4
32	2.00	0.000	0.00	0.39	0.012	1.57	0.02	2.00	1.2	78.2	20.6	79.5
33	1.99	0.000	0.04	0.54	0.014	1.41	0.03	1.99	1.4	71.5	27.0	71.6
34	1.96	0.013	0.06	0.59	0.013	1.32	0.06	1.97	3.1	66.9	30.0	68.8
35	2.02	0.000	0.01	0.51	0.019	1.43	0.05	2.02	2.7	72.6	24.7	72.9
36	1.96	0.019	0.05	0.50	0.000	1.40	0.07	1.98	3.7	71.1	25.3	73.6
37	1.96	0.000	0.04	0.44	0.011	1.47	0.03	1.96	1.7	73.8	24.5	76.4
38	1.98	0.000	0.02	0.45	0.012	1.49	0.03	1.98	1.7	74.5	23.7	76.2
39	2.00	0.000	0.02	0.47	0.015	1.46	0.05	2.00	2.4	73.7	23.9	74.9
40	1.95	0.014	0.04	0.43	0.000	1.46	0.07	1.96	3.5	73.4	23.1	77.2
41	1.99	0.000	0.04	0.54	0.015	1.39	0.04	1.99	2.2	70.4	27.3	71.5
42	1.99	0.000	0.03	0.54	0.015	1.39	0.05	1.99	2.4	70.2	27.4	71.6

43	2.00	0.000	0.03	0.50	0.011	1.45	0.03	2.00	1.4	73.6	24.9	73.9
44	2.00	0.000	0.05	0.63	0.026	1.29	0.06	2.00	2.9	66.3	30.8	66.1
45	1.99	0.007	0.01	0.62	0.018	1.32	0.05	2.00	2.6	66.2	31.2	67.5
46	1.97	0.000	0.05	0.43	0.020	1.50	0.02	1.97	0.9	75.7	23.3	76.8
47	2.02	0.000	0.00	0.49	0.013	1.48	0.03	2.02	1.5	74.7	23.9	74.6
48	2.00	0.000	0.00	0.46	0.013	1.48	0.05	2.00	2.3	74.3	23.4	75.7

Clinopyroxene

#	borehole, depth	SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Na_2O	Total
49	PL-39-538.7	54.66		0.53	6.54		15.52	23.32		100.57
50	PL-40-573.1	53.29		0.21	9.62		13.63	22.88		99.63
51	PL-40-573.1	53.89		0.19	9.06		14.31	22.53		99.98
52	PL-41-306	54.40		1.36	5.87	0.40	15.99	23.84		101.86
53	PL-41-322.3	54.51		2.17	6.88	0.25	16.37	22.40		102.58
54	PL-41-322.3	54.25		0.76	5.49	0.46	16.38	22.65		99.99
55	PL-41-372.4	53.87			6.15	0.70	15.57	22.74		99.03
56	PL-41-372.4	52.07	0.78	1.95	8.03	0.62	15.55	20.64	0.44	100.08
57	PL-41-372.4	51.05	0.77	2.95	8.14	0.53	15.01	20.67	0.40	99.52
58	PL-41-372.4	50.10	1.20	3.29	8.76	0.59	14.84	20.43		99.21
59	PL-41-372.4	50.30	1.10	3.23	8.66	0.62	15.11	20.44		99.46
60	PL-41-388.2	55.56		0.68	3.72	0.81	16.90	25.27		102.94
61	PL-41-388.2	54.19		0.96	5.67	0.72	15.90	22.44	0.55	100.43
62	PL-41-388.2	53.23		0.68	6.43	0.98	15.87	21.56	0.71	99.46
63	PL-41-388.2	53.78		0.83	6.10		15.29	23.02	0.42	99.44
64	PL-41-388.2	50.94		1.74	12.53	0.92	9.63	23.51	0.55	99.82
65	PL-39-351.4	54.55			5.66		15.79	24.64		100.64
66	PL-39-351.4	55.54			5.42		16.75	22.15		99.86
67	PL-39-351.4	54.06		0.25	4.50		16.20	24.42		99.43
68	WF-211-1365.7	47.37		1.19	23.20	2.79	2.75	19.56		96.86
69	WF-211-1365.7	49.68		2.66	16.38	1.02	8.31	20.13	0.96	99.14

#	Si	Ti	Al	Fe^{2+}	Mn	Mg	Ca	Na	Wo	En	Fs	Aeg	Mg#
49	2.01	0.000	0.02	0.24	0.00	0.85	0.92	0.000	46.6	43.2	10.2	0.0	78.0
50	2.00	0.000	0.01	0.32	0.00	0.76	0.92	0.000	46.4	38.4	15.2	0.0	70.6
51	2.01	0.000	0.01	0.31	0.00	0.80	0.90	0.000	45.5	40.2	14.3	0.0	71.7
52	1.97	0.000	0.06	0.17	0.01	0.86	0.92	0.000	46.8	43.6	9.6	0.0	82.6
53	1.96	0.000	0.09	0.21	0.01	0.88	0.86	0.000	44.1	44.9	11.0	0.0	80.0
54	1.99	0.000	0.03	0.19	0.01	0.90	0.89	0.000	45.2	45.5	9.3	0.0	81.4
55	2.01	0.000	0.00	0.21	0.02	0.87	0.91	0.000	45.7	43.5	10.8	0.0	78.7
56	1.92	0.022	0.08	0.19	0.02	0.86	0.82	0.031	41.4	43.4	13.6	1.6	80.4
57	1.90	0.022	0.13	0.19	0.02	0.83	0.82	0.029	42.1	42.6	13.8	1.5	80.1
58	1.88	0.034	0.15	0.24	0.02	0.83	0.82	0.000	42.2	42.7	15.1	0.0	76.0
59	1.88	0.031	0.14	0.23	0.02	0.84	0.82	0.000	42.0	43.2	14.9	0.0	77.1
60	1.98	0.000	0.03	0.09	0.02	0.90	0.96	0.000	48.3	44.9	6.8	0.0	88.4
61	1.98	0.000	0.04	0.14	0.02	0.87	0.88	0.039	44.4	43.8	9.9	2.0	84.6
62	1.96	0.000	0.03	0.11	0.03	0.87	0.85	0.051	42.5	43.5	11.4	2.5	86.4
63	1.99	0.000	0.04	0.17	0.00	0.84	0.91	0.030	46.2	42.7	9.6	1.5	82.9
64	1.94	0.000	0.08	0.32	0.03	0.55	0.96	0.041	48.6	27.7	21.7	2.1	60.8
65	2.00	0.000	0.00	0.17	0.00	0.86	0.97	0.000	48.3	43.1	8.7	0.0	83.6
66	2.04	0.000	0.00	0.25	0.00	0.92	0.87	0.000	44.6	46.9	8.5	0.0	78.5
67	1.99	0.000	0.01	0.14	0.00	0.89	0.97	0.000	48.4	44.7	7.0	0.0	86.6
68	1.98	0.000	0.06	0.83	0.10	0.17	0.88	0.000	44.8	8.8	46.5	0.0	15.5
69	1.93	0.000	0.12	0.43	0.03	0.48	0.84	0.072	42.8	24.6	28.9	3.7	50.8

Compositions are first reported in wt.% oxides, then expressed in terms of atoms per formula unit. Atom proportions were calculated for O = 4 pfu for olivine and O = 6 pfu for pyroxenes. Symbols used: Fo: forsterite, Fa: fayalite, Tep: tephroite for olivine, Wo: wollastonite, En: enstatite, Fs: ferrosilite, Aeg: aegirine for the pyroxenes. Figure 1 gives the location of the drill holes sampled.

SUPPLEMENTARY TABLE 2. THE COMPOSITION OF PLAGIOCLASE, POTASSIUM FELDSPAR AND QUARTZ IN OUR NORILSK SUITES

#	borehole, depth	SiO_2	Al_2O_3	CaO	FeO	Na_2O	K_2O	Total
1	PL-39-538.7	50.23	30.53	14.13	0.69	3.25	0.25	99.08
2	PL-39-538.7	58.43	26.32	8.45	0.46	6.24	0.67	100.57
3	PL-39-538.7	66.66	20.86	1.87	0.64	9.09	1.18	100.30
4	PL-39-538.7	57.83	25.24	7.42	0.73	6.56	0.31	98.09
5	PL-39-538.7	65.72	21.58	3.22	0.44	8.88	0.81	100.65
6	PL-39-538.7	67.54	19.78	1.27	0.58	8.73	2.30	100.20
7	PL-39-544.4	54.72	29.31	12.16	0.55	4.56	0.48	101.78
8	PL-39-544.4	56.24	27.98	10.76	0.50	5.12	0.53	101.13
9	PL-40-556.3	60.76	24.53	6.35	0.76	6.73	1.02	100.15
10	PL-40-556.3	55.26	29.40	12.09	0.72	4.50	0.42	102.39
11	PL-40-556.3	54.85	27.70	10.93	1.14	4.97	0.36	99.95
12	PL-40-556.3	49.95	31.04	14.66		3.19		98.84
13	PL-40-567.5	66.02	21.92	2.87		8.92	0.54	100.27
14	PL-40-567.5	51.39	30.78	14.23	0.68	3.25		100.33
15	PL-40-567.5	51.79	29.76	13.67	0.51	3.49	0.25	99.47
16	PL-40-567.5	54.28	28.91	11.87	0.82	4.52	0.41	100.81
17	PL-40-573.1	51.28	28.80	12.82	0.55	3.87	0.22	97.54
18	PL-40-573.1	54.28	27.49	10.93	0.57	4.92	0.54	98.73
19	PL-40-573.1	55.67	26.51	10.02	0.67	5.31	0.36	98.54
20	PL-40-582.2	58.13	27.10	8.61	0.39	6.39	0.40	101.02
21	PL-40-582.2	55.56	29.29	11.00	0.57	4.97	1.06	102.45
22	PL-40-582.2	63.77	23.09	4.10		8.03	1.00	99.99
23	PL-40-582.2	55.94	29.44	11.68	0.71	4.80	0.40	102.97
24	PL-40-582.2	49.98	32.48	15.49	1.07	2.62	0.19	101.83
25	PL-40-582.2	64.80	23.66	4.81	0.36	8.18	0.99	102.80
26	PL-40-549.8	54.32	29.40	12.42	0.72	4.53	0.25	101.64
27	PL-40-549.8	53.21	30.14	13.25	0.50	3.94		101.04
28	PL-40-549.8	54.30	28.55	11.40	0.81	4.73		99.79
29	PL-40-549.8	49.42	31.35	14.66	0.80	3.10		99.33
30	PL-40-549.8	48.58	32.29	16.38	0.78	2.25		100.28
31	PL-40-549.8	53.78	28.70	12.22	0.45	4.61		99.76
32	PL-40-549.8	55.05	27.72	10.44		5.18		98.39
33	PL-41-214.5	51.34	31.91	15.43	0.58	2.94		102.20
34	PL-41-214.5	54.53	29.57	12.59	0.87	4.58	0.37	102.51
35	PL-41-214.5	49.65	31.08	15.22	0.86	2.72		99.53
36	PL-41-214.5	57.44	27.79	9.47	0.82	5.61	0.40	101.53
37	PL-41-214.5	55.94	27.91	10.68	0.91	5.08	0.34	100.86
38	PL-41-306	58.36	27.64	9.98	0.72	5.67	0.69	103.06
39	PL-41-322.3	54.34	29.66	12.61	0.80	4.34	0.76	102.51
40	PL-41-322.3	48.29	33.44	17.15	0.85	1.77		101.50
41	PL-41-322.3	56.09	28.98	11.68		5.03	0.30	102.08

42	PL-41-329.2	53.80	29.59	12.77	0.57	4.15		100.88
43	PL-41-329.2	53.42	29.17	12.03	0.90	4.61		100.13
44	PL-41-329.2	53.98	28.83	12.40	0.98	4.41		100.60
45	PL-41-329.2	54.40	28.76	12.13	0.59	4.48	0.51	100.87
46	PL-41-329.2	54.21	29.63	12.35	0.55	4.35	0.36	101.45
47	PL-41-372.4	62.90	22.94	4.80	0.37	7.90	0.59	99.50
48	PL-41-372.4	64.48	21.99	3.72	0.26	8.53	0.48	99.46
49	PL-41-372.4	53.14	28.66	11.94	0.62	4.43	0.24	99.03
50	PL-41-372.4	52.82	28.98	12.33	0.37	4.23		98.73
51	PL-41-372.4	53.10	28.89	12.17	0.82	4.15	0.33	99.46
52	PL-41-372.4	51.11	30.10	13.77	1.14	3.56		99.68
53	PL-41-372.4	51.90	29.48	13.05	1.08	3.67	0.24	99.42
54	PL-41-372.4	51.99	29.36	12.86	1.13	3.90	0.34	99.58
55	PL-41-388.2	67.35	20.14	1.01	0.62	10.07	0.17	99.36
56	PL-41-388.2	54.53	27.36	10.73	0.59	5.01	0.33	98.55
57	PL-41-388.2	62.83	20.52	1.15		10.41		94.91
58	PL-42-331.5	51.49	29.34	12.76	0.94	3.75		98.28
59	PL-42-331.5	56.89	25.68	8.20	0.72	6.09	0.24	97.82
60	PL-42-331.5	52.39	29.08	12.52	0.93	4.06	0.34	99.32
61	PL-42-331.5	56.65	26.57	9.28	0.82	5.70	0.28	99.30
62	PL-43-349.4	56.24	27.51	10.13		5.36		99.24
63	PL-43-349.4	54.25	29.32	12.19	0.68	4.46		100.90
64	PL-43-349.4	55.69	28.42	11.38	0.57	5.18		101.24
65	PL-43-349.4	54.51	29.53	12.13		4.22		100.39
66	PL-43-349.4	54.62	29.17	11.36	0.44	5.05		100.64
67	PL-43-349.4	53.53	28.29	11.73		4.54		98.09
68	PL-39-351.4	54.15	28.06	10.79	0.60	5.01		98.61
69	PL-39-351.4	52.11	28.49	12.19	0.53	4.14	0.14	97.60
70	PL-51-185.8	68.95	19.50	0.31		10.60		99.36
71	PL-51-185.8	59.26	25.83	7.70	0.69	6.27	0.83	100.58
72	PL-51-185.8	68.03	19.42	0.83		10.55		98.83
73	PL-51-185.8	69.19	19.97	1.20	0.85	11.00		102.21
74	PL-51-185.8	63.52	21.79	3.75	0.44	8.40	0.99	98.89
75	PL-51-185.8	67.86	19.61	0.41		10.61	0.31	98.80
76	PL-51-185.8	61.78	22.20	4.52		7.56	1.28	97.34
77	PL-54-299.1	47.17	33.78	17.62	0.87	1.63		101.07
78	PL-54-299.1	60.54	23.11	5.81		7.13	0.29	96.88
79	PL-54-299.1	47.37	32.71	16.38	0.55	2.25		99.26
80	PL-54-299.1	48.63	31.40	14.22	0.69	2.62		97.56
81	PL-54-299.1	55.77	27.15	9.50		5.97		98.39
82	WF-211-1365.7	69.49	18.78	0.28		10.58		99.13
83	PL-39-538.7	66.15	18.46			1.82	17.21	103.64
84	PL-41-329.2	62.70	18.20			1.13	17.97	100.00
85	PL-54-299.1	102.75						102.75

#	Si	Al	Al+Si	Ca	Na	K	Fe	Σ	Or	Ab	An
1	2.32	1.66	3.98	0.70	0.29	0.01	0.03	1.03	1.5	29.0	69.6
2	2.61	1.38	3.99	0.40	0.54	0.04	0.02	1.00	3.9	55.0	41.1
3	2.93	1.08	4.00	0.09	0.77	0.07	0.02	0.95	7.1	83.4	9.5
4	2.64	1.36	3.99	0.36	0.58	0.02	0.03	0.99	1.9	60.4	37.7
5	2.88	1.11	4.00	0.15	0.75	0.05	0.02	0.97	4.8	79.3	15.9
6	2.97	1.03	4.00	0.06	0.74	0.13	0.02	0.95	13.8	79.8	6.4
7	2.44	1.54	3.98	0.58	0.39	0.03	0.02	1.02	2.7	39.3	58.0
8	2.51	1.47	3.98	0.51	0.44	0.03	0.02	1.01	3.1	44.9	52.1
9	2.71	1.29	4.00	0.30	0.58	0.06	0.03	0.97	6.2	61.7	32.2
10	2.45	1.53	3.98	0.57	0.39	0.02	0.03	1.01	2.4	39.3	58.3
11	2.49	1.48	3.97	0.53	0.44	0.02	0.04	1.03	2.1	44.2	53.7
12	2.30	1.69	3.99	0.72	0.29	0.00	0.00	1.01	0.0	28.3	71.7
13	2.89	1.13	4.02	0.13	0.76	0.03	0.00	0.92	3.3	82.1	14.6
14	2.33	1.65	3.98	0.69	0.29	0.00	0.03	1.00	0.0	29.2	70.8
15	2.37	1.61	3.98	0.67	0.31	0.01	0.02	1.01	1.5	31.1	67.4
16	2.44	1.53	3.98	0.57	0.39	0.02	0.03	1.02	2.4	39.8	57.8
17	2.39	1.58	3.97	0.64	0.35	0.01	0.02	1.02	1.3	34.9	63.8
18	2.49	1.49	3.97	0.54	0.44	0.03	0.02	1.03	3.1	43.5	53.4
19	2.55	1.43	3.98	0.49	0.47	0.02	0.03	1.01	2.1	47.9	50.0
20	2.58	1.42	4.00	0.41	0.55	0.02	0.01	1.00	2.3	56.0	41.7
21	2.46	1.53	3.99	0.52	0.43	0.06	0.02	1.03	5.9	42.3	51.8
22	2.82	1.20	4.02	0.19	0.69	0.06	0.00	0.94	6.0	73.3	20.7
23	2.46	1.53	3.99	0.55	0.41	0.02	0.03	1.01	2.3	41.7	56.0
24	2.25	1.72	3.98	0.75	0.23	0.01	0.04	1.03	1.1	23.2	75.7
25	2.80	1.20	4.00	0.22	0.68	0.05	0.01	0.97	5.7	71.2	23.1
26	2.43	1.55	3.97	0.59	0.39	0.01	0.03	1.03	1.4	39.2	59.4
27	2.39	1.60	3.98	0.64	0.34	0.00	0.02	1.00	0.0	35.0	65.0
28	2.46	1.52	3.99	0.55	0.42	0.00	0.03	1.00	0.0	42.9	57.1
29	2.28	1.70	3.98	0.72	0.28	0.00	0.03	1.03	0.0	27.7	72.3
30	2.23	1.74	3.97	0.80	0.20	0.00	0.03	1.03	0.0	19.9	80.1
31	2.44	1.54	3.98	0.59	0.41	0.00	0.02	1.02	0.0	40.6	59.4
32	2.51	1.49	4.00	0.51	0.46	0.00	0.00	0.97	0.0	47.3	52.7
33	2.30	1.68	3.98	0.74	0.25	0.00	0.02	1.02	0.0	25.6	74.4
34	2.42	1.55	3.97	0.60	0.39	0.02	0.03	1.05	2.1	38.9	59.1
35	2.28	1.68	3.97	0.75	0.24	0.00	0.03	1.03	0.0	24.4	75.6
36	2.55	1.45	4.00	0.45	0.48	0.02	0.03	0.98	2.4	50.5	47.1
37	2.51	1.47	3.98	0.51	0.44	0.02	0.03	1.01	2.0	45.3	52.7
38	2.55	1.43	3.98	0.47	0.48	0.04	0.03	1.01	3.9	48.7	47.4
39	2.42	1.55	3.97	0.60	0.37	0.04	0.03	1.05	4.2	36.8	59.0
40	2.19	1.79	3.98	0.83	0.16	0.00	0.03	1.02	0.0	15.7	84.3
41	2.48	1.51	3.99	0.55	0.43	0.02	0.00	1.00	1.7	43.1	55.3
42	2.42	1.57	3.98	0.61	0.36	0.00	0.02	1.00	0.0	37.0	63.0
43	2.42	1.56	3.98	0.58	0.41	0.00	0.03	1.02	0.0	40.9	59.1
44	2.44	1.53	3.97	0.60	0.39	0.00	0.04	1.02	0.0	39.2	60.8

45	2.45	1.53	3.97	0.58	0.39	0.03	0.02	1.03	2.9	38.9	58.2
46	2.42	1.56	3.98	0.59	0.38	0.02	0.02	1.01	2.1	38.1	59.8
47	2.80	1.20	4.00	0.23	0.68	0.03	0.01	0.96	3.5	72.2	24.2
48	2.86	1.15	4.00	0.18	0.73	0.03	0.01	0.95	2.9	78.2	18.9
49	2.43	1.55	3.98	0.59	0.39	0.01	0.02	1.02	1.4	39.6	59.0
50	2.42	1.57	3.99	0.61	0.38	0.00	0.01	1.00	0.0	38.3	61.7
51	2.42	1.55	3.98	0.60	0.37	0.02	0.03	1.01	2.0	37.4	60.6
52	2.34	1.63	3.97	0.68	0.32	0.00	0.04	1.04	0.0	31.9	68.1
53	2.38	1.59	3.97	0.64	0.33	0.01	0.04	1.02	1.4	33.2	65.3
54	2.38	1.59	3.97	0.63	0.35	0.02	0.04	1.04	2.0	34.7	63.3
55	2.96	1.04	4.01	0.05	0.86	0.01	0.02	0.94	1.0	93.8	5.2
56	2.50	1.48	3.98	0.53	0.45	0.02	0.02	1.01	1.9	44.9	53.1
57	2.90	1.12	4.02	0.06	0.93	0.00	0.00	0.99	0.0	94.2	5.8
58	2.38	1.60	3.98	0.63	0.34	0.00	0.04	1.01	0.0	34.7	65.3
59	2.61	1.39	3.99	0.40	0.54	0.01	0.03	0.98	1.5	56.5	42.0
60	2.40	1.57	3.97	0.61	0.36	0.02	0.04	1.03	2.0	36.2	61.8
61	2.57	1.42	3.98	0.45	0.50	0.02	0.03	1.00	1.7	51.8	46.6
62	2.54	1.46	4.00	0.49	0.47	0.00	0.00	0.96	0.0	48.9	51.1
63	2.43	1.55	3.98	0.59	0.39	0.00	0.03	1.00	0.0	39.8	60.2
64	2.48	1.49	3.98	0.54	0.45	0.00	0.02	1.01	0.0	45.2	54.8
65	2.45	1.56	4.01	0.58	0.37	0.00	0.00	0.95	0.0	38.6	61.4
66	2.45	1.54	3.99	0.55	0.44	0.00	0.02	1.00	0.0	44.6	55.4
67	2.46	1.53	3.99	0.58	0.40	0.00	0.00	0.98	0.0	41.2	58.8
68	2.48	1.51	3.99	0.53	0.44	0.00	0.02	1.00	0.0	45.7	54.3
69	2.42	1.56	3.98	0.61	0.37	0.01	0.02	1.01	0.8	37.7	61.4
70	3.01	1.00	4.02	0.01	0.90	0.00	0.00	0.91	0.0	98.4	1.6
71	2.64	1.36	4.00	0.37	0.54	0.05	0.03	0.98	4.9	56.6	38.4
72	3.00	1.01	4.01	0.04	0.90	0.00	0.00	0.94	0.0	95.8	4.2
73	2.97	1.01	3.98	0.06	0.92	0.00	0.03	1.00	0.0	94.3	5.7
74	2.84	1.15	3.99	0.18	0.73	0.06	0.02	0.98	5.9	75.5	18.6
75	2.99	1.02	4.01	0.02	0.91	0.02	0.00	0.94	1.8	96.1	2.1
76	2.81	1.19	4.00	0.22	0.67	0.07	0.00	0.96	7.7	69.4	22.9
77	2.15	1.82	3.97	0.86	0.14	0.00	0.03	1.04	0.0	14.3	85.7
78	2.76	1.24	4.01	0.28	0.63	0.02	0.00	0.93	1.8	67.7	30.5
79	2.19	1.79	3.98	0.81	0.20	0.00	0.02	1.04	0.0	19.9	80.1
80	2.27	1.73	4.00	0.71	0.24	0.00	0.03	0.98	0.0	25.0	75.0
81	2.54	1.46	4.00	0.46	0.53	0.00	0.00	0.99	0.0	53.2	46.8
82	3.04	0.97	4.01	0.01	0.90	0.00	0.00	0.91	0.0	98.6	1.4
83	2.98	0.98	3.96	0.00	0.16	0.99	0.00	1.15	86.2	13.8	0.0
84	2.95	1.01	3.96	0.00	0.10	1.08	0.00	1.18	91.3	8.7	0.0
85	1.00	0	0	0	0	0	0	0			

Compositions #1 – 82 are plagioclase, #83 and 84 are potassium feldspar, and #85 is quartz. Atom proportions in plagioclase and potassium feldspar are based on eight oxygen atoms pfu. Symbols used: Ab albite, Or orthoclase, An anorthite. Figure 1 gives the location of the drill holes sampled.

SUPPLEMENTARY TABLE 3. THE COMPOSITION OF CHROMITE, MEMBERS OF THE HERCYNITE–SPINEL SERIES AND MAGNETITE IN OUR NORILSK SUITES

#		TiO_2	Al_2O_3	Cr_2O_3	V_2O_3	Fe_2O_3 calc	FeO calc	FeO total	MnO	MgO	ZnO	Total
						Chromite						
1	PL-39-538.7	1.12	4.65	26.40	0.74	31.41	28.32	56.58		2.21		94.85
2	PL-39-538.7	1.32	4.27	23.18	0.76	33.82	28.46	58.90		1.94		93.76
3	PL-39-538.7	1.20	4.35	26.37	0.76	32.18	28.59	57.55		2.21		95.66
4	PL-39-538.7	1.23	4.53	25.34	0.93	31.65	28.82	57.30		1.82		94.32
5	PL-42-331.5	0.80	6.33	32.32	0.46	24.45	26.78	48.78		3.15		94.29
6	PL-42-331.5	0.75	5.54	30.36	0.66	26.16	27.14	50.68		2.55		93.16
7	PL-42-331.5	2.39	4.74	28.98	0.56	25.52	28.74	51.70		2.44		93.37
						Hercynite						
8	PL-54-299.1	0.38	53.62	0.51		9.33	22.51	30.91		11.44		97.79
9	PL-54-299.1		53.45			9.43	21.69	30.18		11.34		95.91
10	PL-54-299.1	0.38	53.02			8.69	25.81	33.63		8.37	1.39	97.66
11	PL-54-299.1		53.19	0.39		9.65	24.89	33.58	0.35	9.05	0.71	98.24
12	PL-54-299.1		51.02			10.25	25.35	34.57		8.16	0.76	95.54
						Magnetite						
13	PL-41-306					66.29	29.83	89.48				96.12
14	PL-41-306					66.17	29.77	89.31				95.94
15	PL-41-329.2	6.07	1.00			49.82	36.08	80.91	0.65			94.75
16	PL-41-329.2	3.14	0.59			58.41	32.34	84.90				94.48
17	PL-41-372.4	2.64	2.70		0.56	58.24	29.59	81.99	0.71	1.58		96.01

18	PL-41-372.4	2.74	2.02	0.29	0.49	58.51	30.74	83.39	0.45	1.04		96.28
19	PL-39-351.4	0.57	1.98			60.20	33.07	87.24		2.19		101.13
20	PL-39-351.4		0.30			67.27	31.81	92.34		0.66		101.09
21	PL-54-299.1	0.77	0.79	0.67	0.90	62.03	30.60	86.41				95.75
22	PL-54-299.1	2.35	1.55		0.90	58.41	31.35	83.91		0.56		95.25
23	PL-54-299.1		1.1	0.37	0.72	62.89	29.59	86.18				94.67
24	PL-54-299.1	0.28	0.96	0.48	0.59	62.83	29.96	86.49				95.09
25	PL-54-299.1			1.11		67.17	30.75	91.19				99.03
26	PL-54-299.1	0.98	1.32	0.50	0.51	61.58	30.88	86.29				95.77
27	PL-54-299.1	0.65	1.13	0.60	0.53	61.81	30.88	86.50				95.84
28	PL-54-299.1	0.88	1.04	0.37	0.60	61.08	30.72	85.68				94.88
29	WF-211-1416.9	3.27				60.45	33.08	87.48				96.80

#	Ti	Al	Cr	V	Fe^{3+}	Fe^{2+}	Mn	Mg	Zn	Cr#	Mg#	$100Fe^{3+}$
1	0.032	0.21	0.80	0.023	0.90	0.91	0.000	0.13	0.000	79.2	12.2	50.0
2	0.039	0.20	0.71	0.024	0.99	0.93	0.000	0.11	0.000	78.5	10.8	51.7
3	0.034	0.19	0.79	0.023	0.92	0.91	0.000	0.13	0.000	80.3	12.1	50.3
4	0.036	0.21	0.77	0.029	0.92	0.93	0.000	0.10	0.000	79.0	10.1	49.7
5	0.023	0.28	0.96	0.014	0.69	0.85	0.000	0.18	0.000	77.4	17.3	45.1
6	0.022	0.25	0.93	0.020	0.76	0.88	0.000	0.15	0.000	78.6	14.3	46.4
7	0.069	0.22	0.89	0.017	0.74	0.93	0.000	0.14	0.000	80.4	13.1	44.4
8	0.008	1.78	0.01	0.000	0.20	0.53	0.000	0.48	0.000	0.6	47.5	27.2
9	0.000	1.80	0.00	0.000	0.20	0.52	0.000	0.48	0.000	0.0	48.2	28.1
10	0.008	1.80	0.00	0.000	0.19	0.62	0.000	0.36	0.029	0.0	36.6	23.3
11	0.000	1.78	0.01	0.000	0.21	0.59	0.008	0.38	0.015	0.5	39.0	25.9
12	0.000	1.77	0.00	0.000	0.23	0.62	0.000	0.36	0.017	0.0	36.5	26.7
13	0.000	0.00	0.00	0.000	2.00	1.00	0.000	0.00	0.000	0.0	0.0	66.7
14	0.000	0.00	0.00	0.000	2.00	1.00	0.000	0.00	0.000	0.0	0.0	66.7
15	0.182	0.05	0.00	0.000	1.50	1.21	0.022	0.00	0.000	0.0	0.0	55.4
16	0.096	0.03	0.00	0.000	1.78	1.10	0.000	0.00	0.000	0.0	0.0	61.9

17	0.077	0.12	0.00	0.017	1.70	0.96	0.023	0.09	0.000	0.0	8.5	63.9
18	0.081	0.09	0.01	0.015	1.72	1.01	0.015	0.06	0.000	0.0	5.6	63.1
19	0.016	0.09	0.00	0.000	1.66	1.01	0.000	0.12	0.000	8.8	10.6	62.1
20	0.000	0.01	0.00	0.000	1.91	1.00	0.000	0.04	0.000	0.0	3.6	65.6
21	0.023	0.04	0.02	0.029	1.87	1.02	0.000	0.00	0.000	0.0	0.0	64.6
22	0.070	0.07	0.00	0.029	1.75	1.04	0.000	0.03	0.000	36.3	3.1	62.6
23	0.000	0.05	0.01	0.023	1.91	1.00	0.000	0.00	0.000	0.0	0.0	65.7
24	0.008	0.05	0.02	0.019	1.90	1.01	0.000	0.00	0.000	18.4	0.0	65.4
25	0.000	0.00	0.03	0.000	1.97	1.00	0.000	0.00	0.000	25.1	0.0	66.3
26	0.029	0.06	0.02	0.016	1.85	1.03	0.000	0.00	0.000	100.0	0.0	64.2
27	0.019	0.05	0.02	0.017	1.85	1.03	0.000	0.00	0.000	20.3	0.0	64.3
28	0.027	0.05	0.01	0.019	1.85	1.03	0.000	0.00	0.000	26.3	0.0	64.2
29	0.098	0.00	0.00	0.000	1.80	1.10	0.000	0.00	0.000	19.3	0.0	62.2

The composition of chromite, members of the hercynite–spinel series and magnetite are first expressed in weight %, then below in terms of atoms per formula unit, based on charge balance and four atoms of oxygen. Totals include minor contents of SiO_2 omitted in the compositions of magnetite as listed. Figure 1 gives the location of the drill holes sampled.

SUPPLEMENTARY TABLE 4. THE COMPOSITION OF APATITE IN OUR NORILSK SUITES

#	borehole, depth	P_2O_5	SiO_2	Ce_2O_3	La_2O_3	CaO	FeO	Na_2O	Cl	F	O≡Cl	O≡F	Total
1	PL-39-538.7	40.42				52.85			6.69		1.51	0.00	98.45
2	PL-39-538.7	40.56	0.39			52.30	0.37		6.07		1.37	0.00	98.32
3	PL-39-538.7	41.41	0.26			53.25	0.60		6.62		1.50	0.00	100.64
4	PL-39-538.7	41.02	0.56			53.24	0.71		6.86		1.55	0.00	100.84
5	PL-39-538.7	39.23	1.16			50.82	0.90		6.30		1.42	0.00	96.99
6	PL-39-538.7	41.52				53.93	0.66		0.41	2.78	0.09	1.17	98.04
7	PL-39-538.7	42.00				53.69	0.59		0.49	2.88	0.11	1.21	98.33
8	PL-39-538.7	41.43				53.73	0.95		0.45	2.53	0.10	1.07	97.92
9	PL-39-538.7	39.80	0.71			52.85	0.45		6.17		1.39	0.00	98.59
10	PL-39-538.7	40.63		0.39		53.93			6.52		1.47	0.00	100.00
11	PL-39-538.7	41.41		0.33		53.34	0.69		1.42	1.82	0.32	0.77	97.92
12	PL-39-538.7	41.54		0.23		53.67	0.49		1.43	1.23	0.32	0.52	97.75
13	PL-39-538.7	41.41	0.51			53.11	0.58		3.96	0.55	0.89	0.23	98.99
14	PL-39-538.7	40.58				52.89	0.72		5.99		1.35	0.00	98.83
15	PL-39-538.7	41.54	0.47	0.25		53.66	0.53		1.62	1.86	0.37	0.78	98.78
16	PL-39-538.7	41.50	0.49	0.25		53.60	0.36		1.36	1.63	0.31	0.69	98.20
17	PL-39-538.7	37.88	1.58	0.61		53.35	0.46		0.85	1.03	0.19	0.43	95.13
18	PL-39-544.4	40.44	0.92			52.23	1.30		6.72		1.52	0.00	100.09
19	PL-39-544.4	41.84				53.90			6.71		1.52	0.00	100.93
20	PL-39-544.4	40.76	0.96			52.40	0.84		6.48		1.46	0.00	99.98
21	PL-39-544.4	41.31				53.66			6.86		1.55	0.00	100.28
22	PL-39-544.4	41.06	0.77			53.28	0.64		2.90	1.51	0.66	0.64	98.87
23	PL-39-544.4	41.08				53.52	0.72	0.30	4.18	0.45	0.94	0.19	99.12
24	PL-40-554.5	40.70				53.13			6.79		1.53	0.00	99.09
25	PL-40-554.5	41.57				54.43	0.35		4.83		1.09	0.00	100.09
26	PL-40-554.5	41.77				54.37			4.42		1.00	0.00	99.56
27	PL-40-554.5	41.38				53.76	0.44		4.40		0.99	0.00	98.99

28	PL-40-554.5	40.92			52.92	0.36	6.59		1.49	0.00	99.30
29	PL-40-554.5	41.11		0.59	53.00	0.54	6.45		1.46	0.00	100.23
30	PL-40-554.5	40.97			52.72	0.71	6.32		1.43	0.00	99.29
31	PL-40-554.5	41.47			53.97	0.41	4.82		1.09	0.00	99.58
32	PL-40-554.5	40.83			52.51	0.26	6.71		1.52	0.00	98.79
33	PL-40-554.5	41.29			54.30	0.42	4.93		1.11	0.00	99.83
34	PL-40-554.5	41.11			54.07		4.27		0.97	0.00	98.48
35	PL-40-554.5	42.39			54.39		4.63		1.05	0.00	100.36
36	PL-40-554.5	41.27			53.31	0.44	6.76		1.53	0.00	100.25
37	PL-40-554.5	41.20			53.20		6.77		1.53	0.00	99.64
38	PL-40-554.5	40.67			52.81		6.44		1.46	0.00	98.46
39	PL-40-554.5	41.86			54.01		4.41		1.00	0.00	99.28
40	PL-40-554.5	41.04			52.85	0.31	6.67		1.51	0.00	99.36
41	PL-40-554.5	41.84			54.28	0.17	4.47		1.01	0.00	99.75
42	PL-40-554.5	41.96			54.12		4.67		1.06	0.00	99.69
43	PL-40-554.5	41.06			53.41	0.19	6.67		1.51	0.00	99.82
44	PL-40-554.5	41.86			53.91		4.30		0.97	0.00	99.10
45	PL-40-554.5	41.57	0.51		53.97	0.57	4.48		1.01	0.00	100.09
46	PL-40-554.5	41.93			54.39	0.44	4.75		1.07	0.00	100.44
47	PL-40-554.5	41.68			53.94	0.41	6.79		1.53	0.00	101.29
48	PL-40-554.5	41.15			53.93		6.70		1.51	0.00	100.27
49	PL-40-554.5	40.51			53.90		6.58		1.49	0.00	99.50
50	PL-40-556.3	41.86			54.01		7.04		1.59	0.00	101.32
51	PL-40-556.3	41.61			53.98		6.60		1.49	0.00	100.70
52	PL-40-556.3	39.76			51.50	1.14	6.54		1.48	0.00	97.46
53	PL-40-556.3	42.37			55.27		0.74	0.78	0.17	0.33	98.66
54	PL-40-556.3	42.37			54.71		0.90	2.59	0.20	1.09	99.28
55	PL-40-556.3	41.70			53.66		6.96		1.57	0.00	100.75
56	PL-40-556.3	40.83			53.34		6.91		1.56	0.00	99.52
57	PL-40-556.3	41.80			53.32		6.92		1.56	0.00	100.48
58	PL-40-556.3	41.29			53.93		6.97		1.58	0.00	100.61
59	PL-40-567.5	41.38			53.73	0.48	6.75		1.53	0.00	100.81
60	PL-40-567.5	41.18			53.66	0.41	6.89		1.56	0.00	100.58

61	PL-40-567.5	41.73		53.83	0.55	6.93		1.57	0.00	101.47
62	PL-40-567.5	41.13		53.86	0.49	6.57		1.48	0.00	100.57
63	PL-40-567.5	41.13		53.76	0.50	6.13		1.39	0.00	100.13
64	PL-40-567.5	40.90		53.37	0.71	6.70		1.51	0.00	100.17
65	PL-40-567.5	41.22		53.90		4.97		1.12	0.00	98.97
66	PL-40-567.5	41.43		53.87		7.01		1.58	0.00	100.73
67	PL-40-567.5	41.29		53.41		6.85		1.55	0.00	100.00
68	PL-40-567.5	41.59		54.04		7.04		1.59	0.00	101.08
69	PL-40-573.1	40.65	0.21	52.30	0.90	6.38		1.44	0.00	99.00
70	PL-40-573.1	40.63	0.51	51.97	1.17	6.54		1.48	0.00	99.34
71	PL-40-573.1	40.51	0.24	51.81		6.02		1.36	0.00	97.22
72	PL-40-573.1	39.92	0.21	51.71	0.39	5.96		1.35	0.00	96.84
73	PL-40-573.1	44.98		53.60		6.72		1.52	0.00	103.78
74	PL-40-573.1	45.00		53.27		6.71		1.52	0.00	103.46
75	PL-40-582.2	40.01	0.34	53.17	0.57	4.44	0.72	1.00	0.30	97.94
76	PL-40-582.2	42.05		53.67	0.40	4.82	0.50	1.09	0.21	100.14
77	PL-40-582.2	41.73		53.67	0.48	3.95	0.60	0.89	0.25	99.28
78	PL-40-549.8	39.05	0.88	51.49	0.50	6.08	0.30	1.37	0.13	96.80
79	PL-40-549.8	41.50		52.92	0.45	6.03		1.36	0.00	99.54
80	PL-40-549.8	41.22		52.93	0.35	6.53		1.48	0.00	99.55
81	PL-40-549.8	39.64	0.66	52.09		6.67		1.51	0.00	97.55
82	PL-40-549.8	40.44		52.34		6.86		1.55	0.00	98.09
83	PL-41-214.5	42.53		54.54		3.03	1.99	0.68	0.84	100.57
84	PL-41-214.5	42.48		54.48		1.40	2.20	0.32	0.93	99.32
85	PL-41-214.5	40.83	0.68	53.73		2.26	1.76	0.51	0.74	98.01
86	PL-41-214.5	42.69		55.00		0.52	2.92	0.12	1.23	99.78
87	PL-41-214.5	42.69	0.45	55.10	0.64	0.46	2.06	0.10	0.87	100.43
88	PL-41-214.5	41.84		53.93		6.34		1.43	0.00	100.68
89	PL-41-214.5	42.00		54.02		6.33		1.43	0.00	100.92
90	PL-41-214.5	39.78		52.20	0.30	6.90		1.56	0.00	97.62
91	PL-41-214.5	41.29		53.41		6.97		1.58	0.00	100.09
92	PL-41-214.5	41.34		53.02	0.36	6.52		1.47	0.00	99.77
93	PL-41-214.5	40.51		53.16		6.39		1.44	0.00	98.62

94	PL-41-306	40.63	0.56	53.34	0.40		4.29	0.62	0.97	0.26	98.61
95	PL-41-306	40.44	0.56	52.85			4.29	0.33	0.97	0.14	97.36
96	PL-41-306	39.78	0.45	52.36	0.31		4.94	0.49	1.12	0.21	97.01
97	PL-41-322.3	40.58		53.81	0.37		3.70	1.26	0.84	0.53	98.35
98	PL-41-322.3	41.47	0.47	53.38		0.27	4.21	0.95	0.95	0.40	99.40
99	PL-41-322.3	41.11	0.51	53.41	0.68	0.42	3.41	1.40	0.77	0.59	99.58
100	PL-41-322.3	41.54	0.45	53.32			4.93	0.90	1.11	0.38	99.65
101	PL-41-322.3	40.86	0.36	52.44		0.53	5.97	0.26	1.35	0.11	98.96
102	PL-41-322.3	40.26	0.77	52.39	0.57	0.40	6.28	0.26	1.42	0.11	99.40
103	PL-41-322.3	40.08	0.39	52.47		0.54	6.28	0.17	1.42	0.07	98.44
104	PL-41-322.3	40.24	0.47	52.85		0.51	6.14		1.39	0.00	98.82
105	PL-41-322.3	40.10	0.53	52.58		0.57	6.13	0.31	1.39	0.13	98.70
106	PL-41-329.2	42.44		54.57	0.36		1.88	2.25	0.42	0.95	100.13
107	PL-41-329.2	41.59		54.29			1.87	2.32	0.42	0.98	98.67
108	PL-41-329.2	41.77		54.37			2.54	1.74	0.57	0.73	99.11
109	PL-41-329.2	40.42		53.24	0.50		2.42	1.44	0.55	0.61	96.87
110	PL-41-329.2	41.89	0.51	53.93	0.49		2.30	1.84	0.52	0.77	99.67
111	PL-41-329.2	41.18	0.45	53.23	0.42		2.32	1.95	0.52	0.82	98.20
112	PL-41-329.2	40.28	0.47	53.25	0.59		2.15	1.81	0.49	0.76	97.30
113	PL-41-329.2	42.30		54.34	0.36		2.05	2.43	0.46	1.02	99.99
114	PL-41-329.2	42.44		54.43	0.33		1.95	2.60	0.44	1.09	100.21
115	PL-41-329.2	42.37		54.57	0.46		2.09	2.38	0.47	1.00	100.40
116	PL-41-372.4	39.94	0.47	53.14		0.47	4.11	1.09	0.93	0.46	97.83
117	PL-41-372.4	40.01	0.51	53.31			3.96	1.12	0.89	0.47	97.54
118	PL-41-372.4	41.54	0.39	54.53			1.75	1.69	0.40	0.71	98.79
119	PL-41-372.4	40.05	0.47	53.25		0.36	2.42	1.45	0.55	0.61	96.84
120	PL-41-372.4	40.15	0.49	53.45	0.39		2.52	1.58	0.57	0.67	97.35
121	PL-41-372.4	40.60	0.51	53.14	0.45		2.42	1.65	0.55	0.69	97.53
122	PL-41-372.4	40.65	0.51	53.37		0.40	2.52	1.35	0.57	0.57	97.66
123	PL-41-388.2	42.53		54.93			2.64	0.38	0.60	0.16	99.72
124	PL-41-388.2	42.60		54.25	0.04		2.37		0.54	0.00	98.72
125	PL-41-388.2	41.80		55.04			2.19	0.71	0.49	0.30	98.95
126	PL-41-388.2	43.01		55.72			1.75	0.80	0.40	0.34	100.55

127	PL-41-388.2	42.32		55.03	0.44	1.61	1.04	0.36	0.44	99.64
128	PL-41-388.2	43.42		55.38	0.67	2.47	0.44	0.56	0.19	101.64
129	PL-41-388.2	42.25		55.11		2.19	0.49	0.49	0.21	99.34
130	PL-41-388.2	41.66		54.57		2.54		0.57	0.00	98.20
131	PL-41-388.2	40.01		52.44		2.46	0.64	0.56	0.27	94.72
132	PL-41-388.2	40.47		53.04		2.33	0.65	0.53	0.27	95.69
133	PL-41-388.2	40.99		54.04		2.57	0.71	0.58	0.30	97.43
134	PL-41-388.2	41.70		53.80		2.43	0.47	0.55	0.20	97.65
135	PL-41-388.2	41.04		54.01		2.61		0.59	0.00	97.07
136	PL-41-388.2	41.11		54.02		2.88	0.32	0.65	0.13	97.54
137	PL-41-388.2	41.75	0.56	53.95		2.53		0.57	0.00	98.22
138	PL-41-388.2	41.38	0.56	54.65		2.65	0.58	0.60	0.24	98.98
139	PL-41-388.2	41.80		54.53		2.89		0.65	0.00	98.57
140	PL-41-388.2	41.57	0.47	53.95		2.53	0.34	0.57	0.14	98.15
141	PL-41-388.2	41.02	0.3	53.74	0.28	2.56	0.60	0.58	0.25	97.67
142	PL-41-388.2	41.57		54.00		2.25	0.75	0.51	0.32	97.75
143	PL-41-388.2	41.22	0.45	53.91		2.38	0.94	0.54	0.40	97.97
144	PL-41-388.2	42.21		54.33		1.60	1.08	0.36	0.45	98.40
145	PL-41-388.2	39.94	0.41	52.65		2.95	1.20	0.67	0.51	95.98
146	PL-41-388.2	40.35	0.32	52.68		3.03	1.12	0.68	0.47	96.34
147	PL-41-388.2	40.92	0.45	53.79		1.31	1.47	0.30	0.62	97.03
148	PL-41-388.2	41.96		53.91		1.86	1.18	0.42	0.50	97.99
149	PL-41-388.2	41.68	0.45	53.51		1.47	1.17	0.33	0.49	97.46
150	PL-41-388.2	40.95		53.80		1.94	1.79	0.44	0.75	97.29
151	PL-42-331.5	39.09	1.33	50.20	0.53	5.67		1.28	0.00	95.54
152	PL-42-331.5	39.02		51.45	0.44	6.28		1.42	0.00	95.77
153	PL-42-331.5	39.78		52.36		5.98		1.35	0.00	96.77
154	PL-42-331.5	39.60		51.99	0.36	6.45		1.46	0.00	96.94
155	PL-43-349.4	41.11	0.26	53.32	0.32	6.80		1.54	0.00	100.27
156	PL-43-349.4	41.18	0.24	53.17		6.64		1.50	0.00	99.73
157	PL-43-349.4	40.92		53.30	0.41	6.85		1.55	0.00	99.93
158	PL-43-349.4	40.83		52.72	0.73	6.77		1.53	0.00	99.52
159	PL-43-349.4	41.25		53.07	0.59	6.88		1.55	0.00	100.24

160	PL-43-349.4	41.27	53.30	0.42		6.78		1.53	0.00	100.24
161	PL-43-349.4	41.38	53.69	0.60		6.42		1.45	0.00	100.64
162	PL-43-349.4	40.86	53.10	0.58		6.76		1.53	0.00	99.77
163	PL-43-349.4	41.68	54.00	0.57		6.63		1.50	0.00	101.38
164	PL-43-349.4	41.15	53.52	0.73		6.31		1.43	0.00	100.28
165	PL-43-349.4	41.75	53.70	0.37		6.46		1.46	0.00	100.82
166	PL-43-349.4	41.98	53.83	0.72		6.63		1.50	0.00	101.66
167	PL-43-349.4	42.23	53.87	0.60		6.46		1.46	0.00	101.70
168	PL-43-349.4	41.59	53.81	0.58		6.75		1.53	0.00	101.20
169	PL-43-349.4	41.22	53.91	0.53		6.68		1.51	0.00	100.83
170	PL-43-349.4	41.82	53.88	0.62		6.53		1.48	0.00	101.37
171	PL-43-349.4	41.13	53.25	0.63		6.75		1.53	0.00	100.23
172	PL-43-349.4	41.41	53.59	0.51		6.87		1.55	0.00	100.83
173	PL-43-349.4	41.22	54.18	0.39		6.80		1.54	0.00	101.05
174	PL-43-349.4	41.04	53.76	0.64		6.56		1.48	0.00	100.52
175	PL-43-349.4	41.50	53.39			6.73		1.52	0.00	100.10
176	PL-43-349.4	40.99	54.05			6.64		1.50	0.00	100.18
177	PL-43-349.4	41.61	53.66			6.78		1.53	0.00	100.52
178	PL-43-349.4	40.76	53.52			6.55		1.48	0.00	99.35
179	PL-43-349.4	41.20	53.56	0.33		6.18		1.40	0.00	99.87
180	PL-43-349.4	41.27	54.08			6.42		1.45	0.00	100.32
181	PL-43-349.4	41.08	53.62			6.36		1.44	0.00	99.62
182	PL-39-351.4	40.74	53.14	0.57		6.56		1.48	0.00	99.53
183	PL-39-351.4	41.02	53.10	0.73		6.56		1.48	0.00	99.93
184	PL-39-351.4	41.50	53.11			6.56		1.48	0.00	99.69
185	PL-39-351.4	40.86	53.59	0.50		6.67		1.51	0.00	100.11
186	PL-39-351.4	40.08	51.56	0.54		4.05		0.92	0.00	95.31
187	PL-39-351.4	39.96	51.18	0.45		5.72		1.29	0.00	96.02
188	PL-39-351.4	40.15	52.36	0.41		5.30		1.20	0.00	97.02
189	PL-39-351.4	40.17	51.69	0.58		6.10		1.38	0.00	97.16
190	PL-39-351.4	40.58	51.78	0.27	0.26	5.82		1.32	0.00	97.39
191	PL-39-351.4	40.28	51.66			5.91		1.34	0.00	96.51
192	PL-39-351.4	40.58	53.23	0.53		4.61	0.46	1.04	0.19	98.17

193	PL-39-351.4	40.88			53.18	0.50		4.59	0.69	1.04	0.29	98.51
194	PL-39-351.4	40.95			52.33	0.54		6.47		1.46	0.00	98.83
195	PL-39-351.4	41.06			53.02	0.35		6.51		1.47	0.00	99.47
196	PL-39-351.4	39.96			51.95			6.48		1.46	0.00	96.93
197	PL-39-351.4	41.11			53.03			6.17		1.39	0.00	98.92
198	PL-39-351.4	41.31			52.53	0.42		6.31		1.43	0.00	99.14
199	PL-39-351.4	40.86			52.44	0.46	0.30	4.09	0.45	0.92	0.19	97.49
200	PL-39-351.4	40.83			51.85	0.36		4.45	0.15	1.01	0.06	96.57
201	PL-39-351.4	41.02			51.66	0.4		5.43		1.23	0.00	97.28
202	PL-39-351.4	41.06			52.65	0.32	0.32	4.79		1.08	0.00	98.06
203	PL-39-351.4	40.33			52.58	0.46		4.86		1.10	0.00	97.13
204	PL-39-351.4	40.88			52.65	0.28		5.69		1.29	0.00	98.21
205	PL-39-351.4	40.24			51.95	0.44		6.63		1.50	0.00	97.76
206	PL-39-351.4	40.05			52.05	0.68		6.64		1.50	0.00	97.92
207	PL-39-351.4	40.63			51.98			6.03		1.36	0.00	97.28
208	PL-39-351.4	40.28			52.71			6.19		1.40	0.00	97.78
209	PL-39-351.4	40.26			52.47			6.05		1.37	0.00	97.41
210	PL-39-351.4	40.15			51.87	0.35		6.14	0.25	1.39	0.11	97.27
211	PL-39-351.4	39.99			51.83	0.35		6.37		1.44	0.00	97.10
212	PL-39-351.4	40.08			51.73	0.36		6.37		1.44	0.00	97.10
213	PL-39-351.4	40.15			52.39	0.48		6.60		1.49	0.00	98.13
214	PL-39-351.4	40.49			52.53	0.28		6.72		1.52	0.00	98.50
215	PL-39-351.4	40.03			52.18	0.44		6.41		1.45	0.00	97.61
216	PL-51-185.8	41.04	0.30		53.11	0.53		0.70	3.26	0.16	1.37	97.41
217	PL-51-185.8	41.86	0.36	0.35	52.96	0.63		1.24	2.57	0.28	1.08	98.61
218	PL-51-185.8	40.72	0.39		53.27	0.67	0.26	0.64	2.85	0.14	1.20	97.46
219	PL-51-185.8	40.83	0.45		53.18	0.55		0.37	2.97	0.08	1.25	97.02
220	PL-51-185.8	41.18			53.81	0.46		0.86	3.32	0.19	1.40	98.04
221	PL-51-185.8	41.47			54.04	0.57		0.54	2.85	0.12	1.20	98.15
222	PL-51-185.8	42.69			54.19	0.75		0.79	3.24	0.18	1.36	100.12
223	PL-51-185.8	41.52	0.45		53.51	0.57		0.99	2.39	0.22	1.01	98.20
224	PL-51-185.8	42.09			54.08	0.63		0.87	3.17	0.20	1.33	99.31
225	PL-51-185.8	41.96			54.25	0.60		0.80	3.11	0.18	1.31	99.23

226	PL-51-185.8	42.46				54.00	0.60		0.72	2.99	0.16	1.26	99.35
227	PL-51-185.8	41.41	0.64	0.53		53.31	0.63		1.01	2.44	0.23	1.03	98.71
228	PL-51-185.8	41.93				54.14	0.53		0.54	3.02	0.12	1.27	98.77
229	PL-51-185.8	42.28				54.50	0.68		0.68	3.32	0.15	1.40	99.91
230	PL-51-185.8	41.25	0.77	0.87		52.76	0.90		1.82	2.33	0.41	0.98	99.31
231	PL-51-185.8	40.03	0.92	1.37	0.65	51.98	0.44		1.80	1.89	0.41	0.80	97.88
232	PL-51-185.8	41.82	0.34			54.09	0.37		0.42	2.90	0.09	1.22	98.62
233	PL-51-185.8	42.25				54.47	0.57		0.27	3.19	0.06	1.34	99.35
234	PL-51-185.8	42.60				54.88	0.69		0.38	3.02	0.09	1.27	100.21
235	PL-51-185.8	42.32				55.04	0.49		0.41	2.91	0.09	1.23	99.85
236	PL-51-185.8	40.97				53.34	0.27		0.84	2.55	0.19	1.07	96.71
237	PL-51-185.8	41.22				53.51	0.44		0.98	3.08	0.22	1.30	97.71
238	PL-51-185.8	41.57				53.49	0.48		0.63	3.42	0.14	1.44	98.01
239	PL-51-185.8	41.04	0.47			53.46	0.46		0.75	2.71	0.17	1.14	97.58
240	PL-51-185.8	41.80	0.39			53.84	0.53		0.47	3.16	0.11	1.33	98.75
241	PL-51-185.8	40.70	0.34			52.37	0.35		1.00	2.44	0.23	1.03	95.95
242	PL-51-185.8	40.10	0.53	0.52		52.11	0.55		1.25	2.18	0.28	0.92	96.04
243	PL-51-185.8	40.19				53.25	0.69		0.53	2.21	0.12	0.93	95.82
244	PL-51-185.8	42.05				52.90	0.53		0.47	3.00	0.11	1.26	97.58
245	PL-51-185.8	41.54				53.09	0.72		0.68	3.32	0.15	1.40	97.80
246	PL-54-299.1	42.16				54.21	0.33		1.83	2.65	0.41	1.12	99.65
247	PL-54-299.1	41.41		0.75		52.05	0.80		4.04	0.48	0.91	0.20	98.41
248	PL-54-299.1	42.78		0.50		52.51	0.73		3.77	1.18	0.85	0.50	100.12
249	PL-54-299.1	40.31		0.55		51.74	0.73		3.84	1.02	0.87	0.43	96.89
250	PL-54-299.1	40.03		0.42		51.34	0.80		3.57	1.19	0.81	0.50	96.04
251	PL-54-299.1	41.22		0.48		52.16	0.60		3.68	0.90	0.83	0.38	97.83
252	PL-54-299.1	39.64	2.22			50.92	0.76	0.53	3.15	1.11	0.71	0.47	97.15
253	PL-54-299.1	42.18				54.40			1.65	2.33	0.37	0.98	99.21
254	PL-54-299.1	42.05				55.10	0.30		1.70	2.09	0.38	0.88	99.98
255	PL-54-299.1	41.57	0.41			53.20	0.37		1.28	2.19	0.29	0.92	97.81
256	PL-54-299.1	41.57	0.36			53.23	0.40		1.67	1.88	0.38	0.79	97.94
257	PL-54-299.1	40.33		0.41		51.57	0.66	0.47	3.48	1.02	0.79	0.43	96.72
258	PL-54-299.1	41.93				54.07	0.15		1.53	2.33	0.35	0.98	98.68

259	PL-54-299.1	41.66				54.21	0.24		1.44	2.21	0.33	0.93	98.50
260	PL-54-299.1	40.81		0.52		52.22	0.53		3.81	1.08	0.86	0.45	97.65
261	PL-54-299.1	40.10		0.73		51.66	0.80		3.43	1.12	0.78	0.47	96.59
262	PL-54-299.1	41.04		0.52		51.95	0.76		3.06	1.49	0.69	0.63	97.50
263	PL-54-299.1	41.02		0.35		52.01	0.81		3.57	0.96	0.81	0.40	97.51
264	PL-54-299.1	41.41		0.33		51.98	0.66		3.31	1.26	0.75	0.53	97.67
265	PL-54-299.1	40.67				52.16	0.86		3.79	1.27	0.86	0.53	97.36
266	PL-54-299.1	40.67		0.22		51.87	0.62		3.73	1.01	0.84	0.43	96.85
267	PL-54-299.1	41.86				52.51	0.87		3.47	1.31	0.78	0.55	98.68
268	PL-54-299.1	39.96				51.77	0.68		3.48	0.96	0.79	0.40	95.66
269	PL-54-299.1	40.47		0.47		52.27	0.73		3.31	0.82	0.75	0.35	96.98
270	PL-54-299.1	40.95				52.27	0.96	0.32	3.92	0.59	0.89	0.25	97.88
271	PL-54-299.1	41.36		0.28		52.50	0.82		3.45	0.72	0.78	0.30	98.05
272	PL-54-299.1	41.91		0.53		52.22	0.78		3.73	0.86	0.84	0.36	98.82
273	PL-54-299.1	41.50		0.30		52.20	0.82		3.42	1.33	0.77	0.56	98.24
274	PL-54-299.1	41.11				52.37	0.80		3.54	1.22	0.80	0.51	97.73
275	PL-54-299.1	41.15				52.32	0.75		3.50	1.19	0.79	0.50	97.62
276	PL-54-299.1	41.11		0.37		51.67	0.54		3.57	0.65	0.81	0.27	96.83
277	WF-211-1365.7	41.86				54.26	0.67		0.51	2.92	0.12	1.23	98.88
278	WF-211-1365.7	41.27	0.53			53.77	0.59		0.45	2.46	0.10	1.04	97.93
279	WF-211-1365.7	42.41				54.57			0.34	2.53	0.08	1.07	98.71
280	WF-211-1365.7	41.89	0.64			54.37	0.45		0.24	2.17	0.05	0.91	98.79
281	WF-211-1411.7	40.72		0.60	0.28	52.32			6.59		1.49	0.00	99.02
282	WF-211-1411.7	40.72		1.02	0.49	52.46	0.36	0.30	5.71		1.29	0.00	99.77
283	WF-211-1411.7	41.80				54.51	0.37		1.01		0.23	0.00	97.46
284	WF-211-1411.7	41.36				54.53			1.03		0.23	0.00	96.69
285	WF-211-1411.7	40.81		0.64	0.43	52.11	0.75		5.62		1.27	0.00	99.09
286	WF-211-1411.7	40.53		0.63	0.32	52.30	0.59		6.73		1.52	0.00	99.58
287	WF-211-1411.7	40.83		1.04	0.45	52.12	0.82	0.40	6.56		1.48	0.00	100.74
288	WF-211-1411.7	41.15	0.15	0.55	0.25	52.67	0.44		6.70		1.51	0.00	100.40
289	WF-211-1411.7	41.63	0.32	0.77	0.50	52.85			2.88		0.65	0.00	98.30
290	WF-211-1411.7	41.04	0.30	0.33		52.81	0.46		6.49		1.47	0.00	99.96
291	WF-211-1411.7	41.18	0.32	0.25	0.00	52.57	0.31	0.26	6.74		1.52	0.00	100.11

292	WF-211-1411.7	40.56	0.45	0.15	0.15	52.51	0.55	0.26	6.62		1.50	0.00	99.75
293	WF-211-1416.9	41.59	0.36	0.34		53.52	1.39		1.24	0.57	0.28	0.24	98.49
294	WF-211-1416.9	40.05	0.47	0.45		52.74	0.87	0.57	6.32	0.13	1.43	0.05	100.12
295	WF-211-1416.9	41.89				53.74	0.46		2.91		0.66	0.00	98.34
296	WF-211-1416.9	39.66	1.09	0.46		50.78	0.75	0.47	6.34		1.43	0.00	98.12
297	WF-211-1416.9	41.41				52.64	0.57		6.30		1.42	0.00	99.50
298	WF-211-1416.9	42.16	0.41	0.54	0.26	54.46			0.43		0.10	0.00	98.16
299	WF-211-1416.9	41.89	0.28	0.26		53.97			0.70	0.24	0.16	0.10	97.08
300	WF-211-1416.9	41.75	0.34	0.36	0.27	54.37			0.78	0.46	0.18	0.19	97.96
301	WF-211-1416.9	41.80	0.28	0.45	0.23	53.84	0.78		0.66	1.54	0.15	0.65	98.78
302	WF-211-1416.9	41.96		0.33	0.21	54.14			0.99		0.22	0.00	97.41
303	WF-211-1416.9	41.61	0.24	0.88	0.32	53.77	0.86		0.98	0.11	0.22	0.05	98.50
304	WF-211-1416.9	40.95				52.57	0.66		6.27		1.42	0.00	99.03
305	WF-211-1416.9	42.14				54.93	0.93		0.90	0.52	0.20	0.22	99.00
306	WF-211-1416.9	42.18		0.80		54.30			0.54	0.09	0.12	0.04	97.75
307	WF-211-1416.9	42.60				55.31	0.48		0.62	0.46	0.14	0.19	99.14
308	WF-209-576.4	44.98	0.53			54.92			0.61	3.53	0.14	1.49	102.95
309	WF-209-576.4	45.09				54.22	0.40		0.54	3.50	0.12	1.47	102.15
310	WF-209-576.4	43.74	0.56			53.32	0.78		0.54	3.44	0.12	1.45	100.81
311	WF-209-576.4	41.43	0.79			53.24	1.07		0.80	3.21	0.18	1.35	99.01

#	P	Si	Ce	La	Ca	Fe	Na	Cl	F	OH	Cl*	F*	OH*
1	5.79	0.00	0.00	0.00	9.57	0.00	0.00	1.92	0.00	0.08	95.9	0.0	4.1
2	5.80	0.07	0.00	0.00	9.46	0.05	0.00	1.74	0.00	0.26	86.8	0.0	13.2
3	5.79	0.04	0.00	0.00	9.43	0.08	0.00	1.85	0.00	0.15	92.7	0.0	7.3
4	5.73	0.09	0.00	0.00	9.42	0.10	0.00	1.92	0.00	0.08	96.0	0.0	4.0
5	5.69	0.20	0.00	0.00	9.33	0.13	0.00	1.83	0.00	0.17	91.5	0.0	8.5
6	5.82	0.00	0.00	0.00	9.57	0.09	0.00	0.12	1.46	0.43	5.8	72.8	21.4
7	5.85	0.00	0.00	0.00	9.47	0.08	0.00	0.14	1.50	0.36	6.8	75.0	18.2
8	5.83	0.00	0.00	0.00	9.57	0.13	0.00	0.13	1.33	0.54	6.3	66.5	27.2

9	5.70	0.12	0.00	0.00	9.57	0.06	0.00	1.77	0.00	0.23	88.4	0.0	11.6
10	5.75	0.00	0.02	0.00	9.66	0.00	0.00	1.85	0.00	0.15	92.4	0.0	7.6
11	5.86	0.00	0.02	0.00	9.55	0.10	0.00	0.40	0.96	0.64	20.1	48.1	31.8
12	5.90	0.00	0.01	0.00	9.64	0.07	0.00	0.41	0.65	0.94	20.3	32.6	47.1
13	5.83	0.08	0.00	0.00	9.47	0.08	0.00	1.12	0.29	0.59	55.8	14.5	29.7
14	5.79	0.00	0.00	0.00	9.56	0.10	0.00	1.71	0.00	0.29	85.6	0.0	14.4
15	5.81	0.08	0.02	0.00	9.50	0.07	0.00	0.45	0.97	0.57	22.7	48.6	28.7
16	5.84	0.08	0.02	0.00	9.54	0.05	0.00	0.38	0.86	0.76	19.2	42.8	38.0
17	5.58	0.28	0.04	0.00	9.95	0.07	0.00	0.25	0.57	1.18	12.5	28.4	59.1
18	5.70	0.15	0.00	0.00	9.32	0.18	0.00	1.90	0.00	0.10	94.8	0.0	5.2
19	5.83	0.00	0.00	0.00	9.50	0.00	0.00	1.87	0.00	0.13	93.5	0.0	6.5
20	5.73	0.16	0.00	0.00	9.32	0.12	0.00	1.82	0.00	0.18	91.2	0.0	8.8
21	5.80	0.00	0.00	0.00	9.53	0.00	0.00	1.93	0.00	0.07	96.4	0.0	3.6
22	5.76	0.13	0.00	0.00	9.46	0.09	0.00	0.81	0.79	0.39	40.7	39.6	19.7
23	5.82	0.00	0.00	0.00	9.59	0.10	0.10	1.19	0.24	0.58	59.3	11.9	28.8
24	5.79	0.00	0.00	0.00	9.56	0.00	0.00	1.93	0.00	0.07	96.7	0.0	3.3
25	5.84	0.00	0.00	0.00	9.68	0.05	0.00	1.36	0.00	0.64	67.9	0.0	32.1
26	5.88	0.00	0.00	0.00	9.68	0.00	0.00	1.25	0.00	0.75	62.3	0.0	37.7
27	5.87	0.00	0.00	0.00	9.65	0.06	0.00	1.25	0.00	0.75	62.4	0.0	37.6
28	5.81	0.00	0.00	0.00	9.50	0.05	0.00	1.87	0.00	0.13	93.6	0.0	6.4
29	5.80	0.00	0.04	0.00	9.46	0.08	0.00	1.82	0.00	0.18	91.1	0.0	8.9
30	5.81	0.00	0.00	0.00	9.47	0.10	0.00	1.80	0.00	0.20	89.8	0.0	10.2
31	5.85	0.00	0.00	0.00	9.64	0.06	0.00	1.36	0.00	0.64	68.1	0.0	31.9
32	5.82	0.00	0.00	0.00	9.47	0.04	0.00	1.91	0.00	0.09	95.7	0.0	4.3
33	5.82	0.00	0.00	0.00	9.69	0.06	0.00	1.39	0.00	0.61	69.6	0.0	30.4
34	5.86	0.00	0.00	0.00	9.75	0.00	0.00	1.22	0.00	0.78	60.9	0.0	39.1
35	5.91	0.00	0.00	0.00	9.59	0.00	0.00	1.29	0.00	0.71	64.6	0.0	35.4
36	5.80	0.00	0.00	0.00	9.48	0.06	0.00	1.90	0.00	0.10	95.1	0.0	4.9
37	5.82	0.00	0.00	0.00	9.50	0.00	0.00	1.91	0.00	0.09	95.7	0.0	4.3
38	5.81	0.00	0.00	0.00	9.55	0.00	0.00	1.84	0.00	0.16	92.1	0.0	7.9
39	5.90	0.00	0.00	0.00	9.63	0.00	0.00	1.24	0.00	0.76	62.2	0.0	37.8
40	5.81	0.00	0.00	0.00	9.48	0.04	0.00	1.89	0.00	0.11	94.6	0.0	5.4
41	5.88	0.00	0.00	0.00	9.65	0.02	0.00	1.26	0.00	0.74	62.9	0.0	37.1

42	5.89	0.00	0.00	0.00	9.62	0.00	0.00	1.31	0.00	0.69	65.6	0.0	34.4
43	5.80	0.00	0.00	0.00	9.54	0.03	0.00	1.88	0.00	0.12	94.2	0.0	5.8
44	5.91	0.00	0.00	0.00	9.63	0.00	0.00	1.21	0.00	0.79	60.7	0.0	39.3
45	5.82	0.08	0.00	0.00	9.57	0.08	0.00	1.26	0.00	0.74	62.8	0.0	37.2
46	5.86	0.00	0.00	0.00	9.62	0.06	0.00	1.33	0.00	0.67	66.5	0.0	33.5
47	5.80	0.00	0.00	0.00	9.50	0.06	0.00	1.89	0.00	0.11	94.6	0.0	5.4
48	5.79	0.00	0.00	0.00	9.59	0.00	0.00	1.89	0.00	0.11	94.3	0.0	5.7
49	5.75	0.00	0.00	0.00	9.69	0.00	0.00	1.87	0.00	0.13	93.5	0.0	6.5
50	5.81	0.00	0.00	0.00	9.49	0.00	0.00	1.96	0.00	0.04	97.8	0.0	2.2
51	5.81	0.00	0.00	0.00	9.54	0.00	0.00	1.85	0.00	0.15	92.3	0.0	7.7
52	5.77	0.00	0.00	0.00	9.46	0.16	0.00	1.90	0.00	0.10	95.0	0.0	5.0
53	5.95	0.00	0.00	0.00	9.82	0.00	0.00	0.21	0.41	1.38	10.4	20.5	69.1
54	5.86	0.00	0.00	0.00	9.57	0.00	0.00	0.25	1.34	0.41	12.4	66.9	20.7
55	5.82	0.00	0.00	0.00	9.48	0.00	0.00	1.94	0.00	0.06	97.2	0.0	2.8
56	5.78	0.00	0.00	0.00	9.56	0.00	0.00	1.96	0.00	0.04	98.0	0.0	2.0
57	5.84	0.00	0.00	0.00	9.43	0.00	0.00	1.94	0.00	0.06	96.8	0.0	3.2
58	5.78	0.00	0.00	0.00	9.56	0.00	0.00	1.95	0.00	0.05	97.7	0.0	2.3
59	5.79	0.00	0.00	0.00	9.51	0.07	0.00	1.89	0.00	0.11	94.5	0.0	5.5
60	5.78	0.00	0.00	0.00	9.53	0.06	0.00	1.94	0.00	0.06	96.8	0.0	3.2
61	5.80	0.00	0.00	0.00	9.47	0.08	0.00	1.93	0.00	0.07	96.4	0.0	3.6
62	5.78	0.00	0.00	0.00	9.57	0.07	0.00	1.85	0.00	0.15	92.3	0.0	7.7
63	5.79	0.00	0.00	0.00	9.58	0.07	0.00	1.73	0.00	0.27	86.4	0.0	13.6
64	5.77	0.00	0.00	0.00	9.53	0.10	0.00	1.89	0.00	0.11	94.6	0.0	5.4
65	5.85	0.00	0.00	0.00	9.68	0.00	0.00	1.41	0.00	0.59	70.6	0.0	29.4
66	5.79	0.00	0.00	0.00	9.53	0.00	0.00	1.96	0.00	0.04	98.1	0.0	1.9
67	5.81	0.00	0.00	0.00	9.51	0.00	0.00	1.93	0.00	0.07	96.5	0.0	3.5
68	5.80	0.00	0.00	0.00	9.53	0.00	0.00	1.96	0.00	0.04	98.2	0.0	1.8
69	5.79	0.04	0.00	0.00	9.42	0.13	0.00	1.82	0.00	0.18	90.9	0.0	9.1
70	5.76	0.09	0.00	0.00	9.33	0.16	0.00	1.86	0.00	0.14	92.8	0.0	7.2
71	5.84	0.04	0.00	0.00	9.45	0.00	0.00	1.74	0.00	0.26	86.9	0.0	13.1
72	5.80	0.04	0.00	0.00	9.51	0.06	0.00	1.73	0.00	0.27	86.7	0.0	13.3
73	6.01	0.00	0.00	0.00	9.07	0.00	0.00	1.80	0.00	0.20	89.9	0.0	10.1
74	6.03	0.00	0.00	0.00	9.03	0.00	0.00	1.80	0.00	0.20	90.0	0.0	10.0

75	5.73	0.06	0.00	0.00	9.64	0.08	0.00	1.27	0.39	0.34	63.7	19.3	17.0
76	5.87	0.00	0.00	0.00	9.48	0.06	0.00	1.35	0.26	0.39	67.3	13.0	19.7
77	5.87	0.00	0.00	0.00	9.55	0.07	0.00	1.11	0.32	0.57	55.6	15.8	28.6
78	5.68	0.15	0.00	0.00	9.47	0.07	0.00	1.77	0.16	0.07	88.4	8.1	3.4
79	5.85	0.00	0.00	0.00	9.45	0.06	0.00	1.70	0.00	0.30	85.1	0.0	14.9
80	5.82	0.00	0.00	0.00	9.47	0.05	0.00	1.85	0.00	0.15	92.4	0.0	7.6
81	5.72	0.11	0.00	0.00	9.51	0.00	0.00	1.93	0.00	0.07	96.3	0.0	3.7
82	5.80	0.00	0.00	0.00	9.51	0.00	0.00	1.97	0.00	0.03	98.5	0.0	1.5
83	5.84	0.00	0.00	0.00	9.48	0.00	0.00	0.83	1.02	0.15	41.6	51.0	7.3
84	5.88	0.00	0.00	0.00	9.54	0.00	0.00	0.39	1.14	0.47	19.4	56.9	23.7
85	5.76	0.11	0.00	0.00	9.59	0.00	0.00	0.64	0.93	0.43	31.9	46.4	21.7
86	5.85	0.00	0.00	0.00	9.55	0.00	0.00	0.14	1.50	0.36	7.1	74.8	18.1
87	5.85	0.07	0.00	0.00	9.55	0.09	0.00	0.13	1.05	0.82	6.3	52.7	41.0
88	5.84	0.00	0.00	0.00	9.52	0.00	0.00	1.77	0.00	0.23	88.5	0.0	11.5
89	5.84	0.00	0.00	0.00	9.51	0.00	0.00	1.76	0.00	0.24	88.1	0.0	11.9
90	5.76	0.00	0.00	0.00	9.56	0.04	0.00	2.00	0.00	0.00	100.0	0.0	0.0
91	5.81	0.00	0.00	0.00	9.50	0.00	0.00	1.96	0.00	0.04	98.1	0.0	1.9
92	5.83	0.00	0.00	0.00	9.46	0.05	0.00	1.84	0.00	0.16	92.0	0.0	8.0
93	5.79	0.00	0.00	0.00	9.61	0.00	0.00	1.83	0.00	0.17	91.4	0.0	8.6
94	5.76	0.09	0.00	0.00	9.57	0.06	0.00	1.22	0.33	0.45	60.9	16.4	22.7
95	5.80	0.09	0.00	0.00	9.60	0.00	0.00	1.23	0.18	0.59	61.6	8.8	29.5
96	5.75	0.08	0.00	0.00	9.58	0.04	0.00	1.43	0.26	0.31	71.5	13.2	15.3
97	5.77	0.00	0.00	0.00	9.67	0.05	0.00	1.05	0.67	0.28	52.6	33.4	14.0
98	5.80	0.08	0.00	0.00	9.45	0.00	0.09	1.18	0.50	0.32	59.0	24.8	16.2
99	5.75	0.08	0.00	0.00	9.45	0.09	0.13	0.95	0.73	0.31	47.7	36.6	15.7
100	5.80	0.07	0.00	0.00	9.42	0.00	0.00	1.38	0.47	0.15	68.9	23.5	7.6
101	5.79	0.06	0.00	0.00	9.40	0.00	0.17	1.69	0.14	0.17	84.7	6.9	8.4
102	5.70	0.13	0.00	0.00	9.39	0.08	0.13	1.78	0.14	0.08	89.0	6.9	4.1
103	5.73	0.07	0.00	0.00	9.50	0.00	0.18	1.80	0.09	0.11	89.9	4.5	5.5
104	5.74	0.08	0.00	0.00	9.54	0.00	0.17	1.75	0.00	0.25	87.6	0.0	12.4
105	5.72	0.09	0.00	0.00	9.48	0.00	0.19	1.75	0.17	0.09	87.4	8.3	4.3
106	5.84	0.00	0.00	0.00	9.51	0.05	0.00	0.52	1.16	0.32	25.9	57.9	16.2
107	5.81	0.00	0.00	0.00	9.60	0.00	0.00	0.52	1.21	0.27	26.2	60.6	13.3

108	5.83	0.00	0.00	0.00	9.61	0.00	0.00	0.71	0.91	0.38	35.5	45.4	19.1
109	5.81	0.00	0.00	0.00	9.68	0.07	0.00	0.70	0.77	0.53	34.8	38.6	26.6
110	5.81	0.08	0.00	0.00	9.46	0.07	0.00	0.64	0.95	0.41	31.9	47.6	20.5
111	5.79	0.07	0.00	0.00	9.47	0.06	0.00	0.65	1.02	0.32	32.7	51.2	16.1
112	5.74	0.08	0.00	0.00	9.61	0.08	0.00	0.61	0.96	0.42	30.7	48.2	21.1
113	5.83	0.00	0.00	0.00	9.47	0.05	0.00	0.57	1.25	0.18	28.3	62.5	9.2
114	5.83	0.00	0.00	0.00	9.46	0.04	0.00	0.54	1.33	0.13	26.8	66.7	6.5
115	5.82	0.00	0.00	0.00	9.49	0.06	0.00	0.57	1.22	0.20	28.7	61.1	10.2
116	5.71	0.08	0.00	0.00	9.61	0.00	0.15	1.18	0.58	0.24	58.8	29.1	12.1
117	5.72	0.09	0.00	0.00	9.65	0.00	0.00	1.13	0.60	0.27	56.7	29.9	13.4
118	5.81	0.06	0.00	0.00	9.65	0.00	0.00	0.49	0.88	0.63	24.5	44.2	31.3
119	5.75	0.08	0.00	0.00	9.67	0.00	0.12	0.70	0.78	0.53	34.8	38.9	26.4
120	5.73	0.08	0.00	0.00	9.66	0.06	0.00	0.72	0.84	0.44	36.0	42.2	21.8
121	5.77	0.09	0.00	0.00	9.56	0.06	0.00	0.69	0.88	0.44	34.4	43.8	21.8
122	5.78	0.09	0.00	0.00	9.60	0.00	0.13	0.72	0.72	0.57	35.9	35.8	28.3
123	5.93	0.00	0.00	0.00	9.70	0.00	0.00	0.74	0.20	1.06	36.9	9.9	53.2
124	6.00	0.00	0.00	0.00	9.67	0.01	0.00	0.67	0.00	1.33	33.4	0.0	66.6
125	5.88	0.00	0.00	0.00	9.80	0.00	0.00	0.62	0.37	1.01	30.8	18.7	50.5
126	5.93	0.00	0.00	0.00	9.72	0.00	0.00	0.48	0.41	1.10	24.2	20.6	55.2
127	5.90	0.00	0.00	0.00	9.70	0.06	0.00	0.45	0.54	1.01	22.5	27.1	50.5
128	5.95	0.00	0.00	0.00	9.60	0.09	0.00	0.68	0.23	1.10	33.8	11.3	54.9
129	5.92	0.00	0.00	0.00	9.77	0.00	0.00	0.61	0.26	1.13	30.7	12.8	56.5
130	5.93	0.00	0.00	0.00	9.82	0.00	0.00	0.72	0.00	1.28	36.2	0.0	63.8
131	5.88	0.00	0.00	0.00	9.76	0.00	0.00	0.72	0.35	0.92	36.2	17.6	46.2
132	5.89	0.00	0.00	0.00	9.77	0.00	0.00	0.68	0.35	0.97	33.9	17.7	48.4
133	5.86	0.00	0.00	0.00	9.78	0.00	0.00	0.74	0.38	0.88	36.8	19.0	44.2
134	5.94	0.00	0.00	0.00	9.69	0.00	0.00	0.69	0.25	1.06	34.6	12.5	52.9
135	5.91	0.00	0.00	0.00	9.85	0.00	0.00	0.75	0.00	1.25	37.6	0.0	62.4
136	5.89	0.00	0.00	0.00	9.79	0.00	0.00	0.83	0.17	1.00	41.3	8.6	50.2
137	5.91	0.09	0.00	0.00	9.67	0.00	0.00	0.72	0.00	1.28	35.9	0.0	64.1
138	5.82	0.09	0.00	0.00	9.73	0.00	0.00	0.75	0.30	0.95	37.3	15.2	47.4
139	5.92	0.00	0.00	0.00	9.78	0.00	0.00	0.82	0.00	1.18	41.0	0.0	59.0
140	5.89	0.08	0.00	0.00	9.67	0.00	0.00	0.72	0.18	1.10	35.9	9.0	55.1

141	5.85	0.05	0.00	0.00	9.70	0.04	0.00	0.73	0.32	0.95	36.6	16.0	47.5
142	5.91	0.00	0.00	0.00	9.71	0.00	0.00	0.64	0.40	0.96	32.0	19.9	48.1
143	5.84	0.08	0.00	0.00	9.66	0.00	0.00	0.67	0.50	0.83	33.7	24.9	41.4
144	5.93	0.00	0.00	0.00	9.66	0.00	0.00	0.45	0.57	0.98	22.5	28.3	49.1
145	5.78	0.07	0.00	0.00	9.65	0.00	0.00	0.86	0.65	0.50	42.8	32.5	24.8
146	5.82	0.05	0.00	0.00	9.61	0.00	0.00	0.87	0.60	0.52	43.7	30.2	26.1
147	5.83	0.08	0.00	0.00	9.70	0.00	0.00	0.37	0.78	0.84	18.7	39.1	42.2
148	5.92	0.00	0.00	0.00	9.63	0.00	0.00	0.53	0.62	0.85	26.3	31.1	42.6
149	5.90	0.08	0.00	0.00	9.58	0.00	0.00	0.42	0.62	0.96	20.8	30.9	48.2
150	5.83	0.00	0.00	0.00	9.69	0.00	0.00	0.55	0.95	0.50	27.6	47.6	24.8
151	5.73	0.23	0.00	0.00	9.31	0.08	0.00	1.66	0.00	0.34	83.2	0.0	16.8
152	5.76	0.00	0.00	0.00	9.61	0.06	0.00	1.86	0.00	0.14	92.8	0.0	7.2
153	5.79	0.00	0.00	0.00	9.65	0.00	0.00	1.74	0.00	0.26	87.2	0.0	12.8
154	5.77	0.00	0.00	0.00	9.59	0.05	0.00	1.88	0.00	0.12	94.1	0.0	5.9
155	5.77	0.04	0.00	0.00	9.48	0.04	0.00	1.91	0.00	0.09	95.6	0.0	4.4
156	5.80	0.04	0.00	0.00	9.48	0.00	0.00	1.87	0.00	0.13	93.6	0.0	6.4
157	5.78	0.00	0.00	0.00	9.53	0.06	0.00	1.94	0.00	0.06	96.8	0.0	3.2
158	5.79	0.00	0.00	0.00	9.46	0.10	0.00	1.92	0.00	0.08	96.1	0.0	3.9
159	5.80	0.00	0.00	0.00	9.45	0.08	0.00	1.94	0.00	0.06	96.8	0.0	3.2
160	5.80	0.00	0.00	0.00	9.48	0.06	0.00	1.91	0.00	0.09	95.4	0.0	4.6
161	5.80	0.00	0.00	0.00	9.52	0.08	0.00	1.80	0.00	0.20	90.0	0.0	10.0
162	5.78	0.00	0.00	0.00	9.51	0.08	0.00	1.91	0.00	0.09	95.7	0.0	4.3
163	5.80	0.00	0.00	0.00	9.51	0.08	0.00	1.85	0.00	0.15	92.3	0.0	7.7
164	5.79	0.00	0.00	0.00	9.53	0.10	0.00	1.78	0.00	0.22	88.9	0.0	11.1
165	5.83	0.00	0.00	0.00	9.48	0.05	0.00	1.80	0.00	0.20	90.2	0.0	9.8
166	5.82	0.00	0.00	0.00	9.44	0.10	0.00	1.84	0.00	0.16	92.0	0.0	8.0
167	5.84	0.00	0.00	0.00	9.43	0.08	0.00	1.79	0.00	0.21	89.4	0.0	10.6
168	5.80	0.00	0.00	0.00	9.49	0.08	0.00	1.88	0.00	0.12	94.1	0.0	5.9
169	5.77	0.00	0.00	0.00	9.56	0.07	0.00	1.87	0.00	0.13	93.7	0.0	6.3
170	5.81	0.00	0.00	0.00	9.48	0.09	0.00	1.82	0.00	0.18	90.8	0.0	9.2
171	5.79	0.00	0.00	0.00	9.49	0.09	0.00	1.90	0.00	0.10	95.1	0.0	4.9
172	5.79	0.00	0.00	0.00	9.49	0.07	0.00	1.92	0.00	0.08	96.2	0.0	3.8
173	5.76	0.00	0.00	0.00	9.59	0.05	0.00	1.90	0.00	0.10	95.2	0.0	4.8

174	5.77	0.00	0.00	0.00	9.56	0.09	0.00	1.85	0.00	0.15	92.3	0.0	7.7
175	5.83	0.00	0.00	0.00	9.49	0.00	0.00	1.89	0.00	0.11	94.6	0.0	5.4
176	5.77	0.00	0.00	0.00	9.63	0.00	0.00	1.87	0.00	0.13	93.6	0.0	6.4
177	5.82	0.00	0.00	0.00	9.50	0.00	0.00	1.90	0.00	0.10	94.9	0.0	5.1
178	5.78	0.00	0.00	0.00	9.61	0.00	0.00	1.86	0.00	0.14	93.0	0.0	7.0
179	5.81	0.00	0.00	0.00	9.56	0.05	0.00	1.74	0.00	0.26	87.2	0.0	12.8
180	5.80	0.00	0.00	0.00	9.61	0.00	0.00	1.80	0.00	0.20	90.2	0.0	9.8
181	5.80	0.00	0.00	0.00	9.59	0.00	0.00	1.80	0.00	0.20	90.0	0.0	10.0
182	5.78	0.00	0.00	0.00	9.54	0.08	0.00	1.86	0.00	0.14	93.1	0.0	6.9
183	5.79	0.00	0.00	0.00	9.49	0.10	0.00	1.85	0.00	0.15	92.7	0.0	7.3
184	5.84	0.00	0.00	0.00	9.46	0.00	0.00	1.85	0.00	0.15	92.5	0.0	7.5
185	5.77	0.00	0.00	0.00	9.57	0.07	0.00	1.88	0.00	0.12	94.2	0.0	5.8
186	5.89	0.00	0.00	0.00	9.59	0.08	0.00	1.19	0.00	0.81	59.6	0.0	40.4
187	5.85	0.00	0.00	0.00	9.48	0.07	0.00	1.68	0.00	0.32	83.8	0.0	16.2
188	5.82	0.00	0.00	0.00	9.61	0.06	0.00	1.54	0.00	0.46	76.9	0.0	23.1
189	5.82	0.00	0.00	0.00	9.48	0.08	0.00	1.77	0.00	0.23	88.5	0.0	11.5
190	5.85	0.00	0.00	0.00	9.45	0.04	0.09	1.68	0.00	0.32	84.0	0.0	16.0
191	5.85	0.00	0.00	0.00	9.50	0.00	0.00	1.72	0.00	0.28	86.0	0.0	14.0
192	5.80	0.00	0.00	0.00	9.63	0.07	0.00	1.32	0.25	0.43	66.0	12.3	21.7
193	5.81	0.00	0.00	0.00	9.57	0.07	0.00	1.31	0.37	0.33	65.3	18.3	16.4
194	5.83	0.00	0.00	0.00	9.43	0.08	0.00	1.84	0.00	0.16	92.2	0.0	7.8
195	5.81	0.00	0.00	0.00	9.50	0.05	0.00	1.84	0.00	0.16	92.2	0.0	7.8
196	5.80	0.00	0.00	0.00	9.55	0.00	0.00	1.88	0.00	0.12	94.2	0.0	5.8
197	5.84	0.00	0.00	0.00	9.53	0.00	0.00	1.75	0.00	0.25	87.7	0.0	12.3
198	5.85	0.00	0.00	0.00	9.42	0.06	0.00	1.79	0.00	0.21	89.5	0.0	10.5
199	5.86	0.00	0.00	0.00	9.52	0.07	0.10	1.17	0.24	0.58	58.7	12.1	29.2
200	5.91	0.00	0.00	0.00	9.49	0.05	0.00	1.29	0.08	0.63	64.4	4.1	31.5
201	5.90	0.00	0.00	0.00	9.41	0.06	0.00	1.56	0.00	0.44	78.2	0.0	21.8
202	5.87	0.00	0.00	0.00	9.53	0.05	0.10	1.37	0.00	0.63	68.6	0.0	31.4
203	5.84	0.00	0.00	0.00	9.63	0.07	0.00	1.41	0.00	0.59	70.4	0.0	29.6
204	5.85	0.00	0.00	0.00	9.53	0.04	0.00	1.63	0.00	0.37	81.5	0.0	18.5
205	5.80	0.00	0.00	0.00	9.48	0.06	0.00	1.91	0.00	0.09	95.7	0.0	4.3
206	5.78	0.00	0.00	0.00	9.50	0.10	0.00	1.92	0.00	0.08	95.9	0.0	4.1

207	5.86	0.00	0.00	0.00	9.48	0.00	0.00	1.74	0.00	0.26	87.0	0.0	13.0
208	5.80	0.00	0.00	0.00	9.61	0.00	0.00	1.78	0.00	0.22	89.2	0.0	10.8
209	5.81	0.00	0.00	0.00	9.59	0.00	0.00	1.75	0.00	0.25	87.5	0.0	12.5
210	5.80	0.00	0.00	0.00	9.49	0.05	0.00	1.78	0.13	0.09	88.8	6.7	4.4
211	5.80	0.00	0.00	0.00	9.52	0.05	0.00	1.85	0.00	0.15	92.5	0.0	7.5
212	5.81	0.00	0.00	0.00	9.49	0.05	0.00	1.85	0.00	0.15	92.5	0.0	7.5
213	5.78	0.00	0.00	0.00	9.54	0.07	0.00	1.90	0.00	0.10	95.0	0.0	5.0
214	5.79	0.00	0.00	0.00	9.51	0.04	0.00	1.92	0.00	0.08	96.2	0.0	3.8
215	5.79	0.00	0.00	0.00	9.54	0.06	0.00	1.85	0.00	0.15	92.7	0.0	7.3
216	5.77	0.05	0.00	0.00	9.45	0.07	0.00	0.20	1.71	0.09	9.8	85.6	4.5
217	5.83	0.06	0.02	0.00	9.34	0.09	0.00	0.35	1.34	0.32	17.3	66.9	15.8
218	5.75	0.07	0.00	0.00	9.52	0.09	0.08	0.18	1.50	0.32	9.0	75.2	15.8
219	5.77	0.08	0.00	0.00	9.51	0.08	0.00	0.10	1.57	0.33	5.2	78.4	16.4
220	5.77	0.00	0.00	0.00	9.53	0.06	0.00	0.24	1.74	0.02	12.1	86.8	1.1
221	5.81	0.00	0.00	0.00	9.58	0.08	0.00	0.15	1.49	0.36	7.6	74.6	17.9
222	5.84	0.00	0.00	0.00	9.37	0.10	0.00	0.22	1.65	0.13	10.8	82.7	6.5
223	5.81	0.07	0.00	0.00	9.48	0.08	0.00	0.28	1.25	0.47	13.9	62.5	23.6
224	5.81	0.00	0.00	0.00	9.45	0.09	0.00	0.24	1.63	0.12	12.0	81.7	6.2
225	5.80	0.00	0.00	0.00	9.50	0.08	0.00	0.22	1.61	0.17	11.1	80.3	8.6
226	5.85	0.00	0.00	0.00	9.42	0.08	0.00	0.20	1.54	0.26	9.9	77.0	13.1
227	5.78	0.11	0.03	0.00	9.42	0.09	0.00	0.28	1.27	0.44	14.1	63.6	22.2
228	5.82	0.00	0.00	0.00	9.51	0.07	0.00	0.15	1.57	0.28	7.5	78.3	14.2
229	5.80	0.00	0.00	0.00	9.46	0.09	0.00	0.19	1.70	0.11	9.3	85.1	5.6
230	5.75	0.13	0.05	0.00	9.31	0.12	0.00	0.51	1.21	0.28	25.4	60.7	13.9
231	5.71	0.16	0.08	0.04	9.39	0.06	0.00	0.51	1.01	0.48	25.7	50.4	23.9
232	5.81	0.06	0.00	0.00	9.51	0.05	0.00	0.12	1.50	0.38	5.8	75.2	18.9
233	5.82	0.00	0.00	0.00	9.50	0.08	0.00	0.07	1.64	0.28	3.7	82.1	14.1
234	5.83	0.00	0.00	0.00	9.51	0.09	0.00	0.10	1.54	0.35	5.2	77.2	17.6
235	5.82	0.00	0.00	0.00	9.58	0.07	0.00	0.11	1.50	0.39	5.6	74.8	19.6
236	5.83	0.00	0.00	0.00	9.60	0.04	0.00	0.24	1.35	0.41	12.0	67.7	20.3
237	5.79	0.00	0.00	0.00	9.51	0.06	0.00	0.28	1.62	0.11	13.8	80.8	5.4
238	5.80	0.00	0.00	0.00	9.45	0.07	0.00	0.18	1.78	0.04	8.8	89.2	2.0
239	5.78	0.08	0.00	0.00	9.52	0.06	0.00	0.21	1.42	0.36	10.6	71.2	18.2

240	5.79	0.06	0.00	0.00	9.44	0.07	0.00	0.13	1.64	0.23	6.5	81.8	11.7
241	5.82	0.06	0.00	0.00	9.48	0.05	0.00	0.29	1.30	0.41	14.3	65.2	20.5
242	5.77	0.09	0.03	0.00	9.49	0.08	0.00	0.36	1.17	0.47	18.0	58.6	23.4
243	5.80	0.00	0.00	0.00	9.73	0.10	0.00	0.15	1.19	0.66	7.7	59.6	32.8
244	5.88	0.00	0.00	0.00	9.37	0.07	0.00	0.13	1.57	0.30	6.6	78.4	15.0
245	5.81	0.00	0.00	0.00	9.40	0.10	0.00	0.19	1.74	0.07	9.5	86.8	3.7
246	5.82	0.00	0.00	0.00	9.47	0.04	0.00	0.51	1.37	0.13	25.3	68.3	6.4
247	5.90	0.00	0.05	0.00	9.38	0.11	0.00	1.15	0.26	0.59	57.6	12.8	29.7
248	5.93	0.00	0.03	0.00	9.21	0.10	0.00	1.05	0.61	0.34	52.3	30.5	17.2
249	5.82	0.00	0.03	0.00	9.46	0.10	0.00	1.11	0.55	0.34	55.5	27.5	17.0
250	5.82	0.00	0.03	0.00	9.45	0.11	0.00	1.04	0.65	0.31	52.0	32.3	15.7
251	5.88	0.00	0.03	0.00	9.41	0.08	0.00	1.05	0.48	0.47	52.5	24.0	23.5
252	5.65	0.37	0.00	0.00	9.19	0.11	0.17	0.90	0.59	0.51	44.9	29.6	25.5
253	5.85	0.00	0.00	0.00	9.55	0.00	0.00	0.46	1.21	0.34	22.9	60.3	16.8
254	5.82	0.00	0.00	0.00	9.64	0.04	0.00	0.47	1.08	0.45	23.5	54.0	22.5
255	5.84	0.07	0.00	0.00	9.46	0.05	0.00	0.36	1.15	0.49	18.0	57.5	24.5
256	5.85	0.06	0.00	0.00	9.48	0.06	0.00	0.47	0.99	0.54	23.5	49.4	27.1
257	5.83	0.00	0.03	0.00	9.43	0.09	0.16	1.01	0.55	0.44	50.4	27.5	22.1
258	5.85	0.00	0.00	0.00	9.54	0.02	0.00	0.43	1.21	0.36	21.4	60.7	18.0
259	5.83	0.00	0.00	0.00	9.61	0.03	0.00	0.40	1.16	0.44	20.2	57.8	22.0
260	5.84	0.00	0.03	0.00	9.45	0.07	0.00	1.09	0.58	0.33	54.5	28.9	16.6
261	5.81	0.00	0.05	0.00	9.48	0.11	0.00	1.00	0.61	0.40	49.8	30.3	19.9
262	5.85	0.00	0.03	0.00	9.38	0.11	0.00	0.87	0.79	0.33	43.7	39.7	16.6
263	5.87	0.00	0.02	0.00	9.42	0.11	0.00	1.02	0.51	0.46	51.1	25.7	23.2
264	5.89	0.00	0.02	0.00	9.35	0.09	0.00	0.94	0.67	0.39	47.1	33.5	19.4
265	5.82	0.00	0.00	0.00	9.45	0.12	0.00	1.09	0.68	0.24	54.3	33.9	11.8
266	5.85	0.00	0.01	0.00	9.45	0.09	0.00	1.07	0.54	0.38	53.7	27.2	19.1
267	5.88	0.00	0.00	0.00	9.34	0.12	0.00	0.98	0.69	0.34	48.8	34.4	16.8
268	5.83	0.00	0.00	0.00	9.56	0.10	0.00	1.02	0.52	0.46	50.8	26.2	23.0
269	5.84	0.00	0.03	0.00	9.55	0.10	0.00	0.96	0.44	0.60	47.8	22.1	30.1
270	5.85	0.00	0.00	0.00	9.46	0.14	0.10	1.12	0.32	0.56	56.1	15.8	28.2
271	5.89	0.00	0.02	0.00	9.46	0.12	0.00	0.98	0.38	0.63	49.2	19.1	31.7
272	5.91	0.00	0.03	0.00	9.32	0.11	0.00	1.05	0.45	0.49	52.6	22.6	24.7

273	5.87	0.00	0.02	0.00	9.35	0.11	0.00	0.97	0.70	0.33	48.4	35.1	16.4
274	5.85	0.00	0.00	0.00	9.43	0.11	0.00	1.01	0.65	0.34	50.4	32.4	17.1
275	5.86	0.00	0.00	0.00	9.43	0.11	0.00	1.00	0.63	0.37	49.9	31.7	18.5
276	5.92	0.00	0.02	0.00	9.41	0.08	0.00	1.03	0.35	0.62	51.4	17.5	31.1
277	5.82	0.00	0.00	0.00	9.54	0.09	0.00	0.14	1.52	0.34	7.1	75.8	17.1
278	5.79	0.09	0.00	0.00	9.55	0.08	0.00	0.13	1.29	0.58	6.3	64.5	29.2
279	5.89	0.00	0.00	0.00	9.58	0.00	0.00	0.09	1.31	0.59	4.7	65.6	29.7
280	5.83	0.11	0.00	0.00	9.57	0.06	0.00	0.07	1.13	0.81	3.3	56.4	40.3
281	5.81	0.00	0.04	0.02	9.45	0.00	0.00	1.88	0.00	0.12	94.1	0.0	5.9
282	5.80	0.00	0.06	0.03	9.45	0.05	0.10	1.63	0.00	0.37	81.4	0.0	18.6
283	5.98	0.00	0.00	0.00	9.86	0.05	0.00	0.29	0.00	1.71	14.5	0.0	85.5
284	5.96	0.00	0.00	0.00	9.95	0.00	0.00	0.30	0.00	1.70	14.9	0.0	85.1
285	5.83	0.00	0.04	0.03	9.42	0.11	0.00	1.61	0.00	0.39	80.3	0.0	19.7
286	5.78	0.00	0.04	0.02	9.43	0.08	0.00	1.92	0.00	0.08	96.0	0.0	4.0
287	5.77	0.00	0.06	0.03	9.32	0.11	0.13	1.86	0.00	0.14	92.8	0.0	7.2
288	5.79	0.02	0.03	0.02	9.39	0.06	0.00	1.89	0.00	0.11	94.4	0.0	5.6
289	5.93	0.05	0.05	0.03	9.53	0.00	0.00	0.82	0.00	1.18	41.1	0.0	58.9
290	5.79	0.05	0.02	0.00	9.42	0.06	0.00	1.83	0.00	0.17	91.6	0.0	8.4
291	5.79	0.05	0.02	0.00	9.36	0.04	0.08	1.90	0.00	0.10	94.9	0.0	5.1
292	5.74	0.08	0.01	0.01	9.41	0.08	0.08	1.88	0.00	0.12	93.8	0.0	6.2
293	5.89	0.06	0.02	0.00	9.60	0.19	0.00	0.35	0.30	1.35	17.6	15.1	67.3
294	5.68	0.08	0.03	0.00	9.46	0.12	0.19	1.79	0.07	0.14	89.7	3.4	6.9
295	5.95	0.00	0.00	0.00	9.65	0.06	0.00	0.83	0.00	1.17	41.3	0.0	58.7
296	5.70	0.19	0.03	0.00	9.24	0.11	0.15	1.82	0.00	0.18	91.2	0.0	8.8
297	5.85	0.00	0.00	0.00	9.41	0.08	0.00	1.78	0.00	0.22	89.1	0.0	10.9
298	5.98	0.07	0.03	0.02	9.78	0.00	0.00	0.12	0.00	1.88	6.1	0.0	93.9
299	5.98	0.05	0.02	0.00	9.76	0.00	0.00	0.20	0.13	1.67	10.0	6.4	83.6
300	5.93	0.06	0.02	0.02	9.77	0.00	0.00	0.22	0.24	1.53	11.1	12.2	76.7
301	5.87	0.05	0.03	0.01	9.57	0.11	0.00	0.19	0.81	1.01	9.3	40.4	50.3
302	6.00	0.00	0.02	0.01	9.80	0.00	0.00	0.28	0.00	1.72	14.2	0.0	85.8
303	5.93	0.04	0.05	0.02	9.70	0.12	0.00	0.28	0.06	1.66	14.0	2.9	83.1
304	5.82	0.00	0.00	0.00	9.46	0.09	0.00	1.78	0.00	0.22	89.2	0.0	10.8
305	5.93	0.00	0.00	0.00	9.78	0.13	0.00	0.25	0.27	1.47	12.7	13.7	73.7

306	6.01	0.00	0.05	0.00	9.79	0.00	0.00	0.15	0.05	1.80	7.7	2.4	89.9
307	5.97	0.00	0.00	0.00	9.81	0.07	0.00	0.17	0.24	1.59	8.7	12.0	79.3
308	5.91	0.08	0.00	0.00	9.13	0.00	0.00	0.16	1.73	0.11	8.0	86.6	5.4
309	5.97	0.00	0.00	0.00	9.09	0.05	0.00	0.14	1.73	0.13	7.2	86.6	6.3
310	5.88	0.09	0.00	0.00	9.08	0.10	0.00	0.15	1.73	0.13	7.3	86.4	6.3
311	5.73	0.13	0.00	0.00	9.32	0.15	0.00	0.22	1.66	0.12	11.1	83.0	6.0

The composition of apatite is first expressed in weight %, then below in terms of atoms per formula unit, based on 25 atoms of oxygen per formula unit. The amount of OH is calculated. * The proportion of Cl, F and OH is expressed in mol.%. Figure 1 gives the location of the drill holes sampled.

SUPPLEMENTARY TABLE 5. THE COMPOSITION OF MICA-GROUP MINERALS IN OUR NORILSK SUITES

#	borehole, depth	SiO_2	TiO_2	Al_2O_3	V_2O_3	FeO	MnO	MgO	CaO	BaO	NiO	Na_2O	K_2O	Cl	Cl≡O	Total
1	PL-39-538.7	40.58		11.22		12.04		19.57				0.61	8.73	0.50	0.11	93.14
2	PL-39-538.7	39.11		11.34		21.33		12.97		0.63			10.43	4.05	0.92	98.94
3	PL-39-538.7	40.35		10.54		16.25		17.28	0.49				8.17	1.96	0.44	94.60
4	PL-39-538.7	37.12	3.89	13.32		11.39		17.25				1.04	9.40	0.23	0.05	93.59
5	PL-39-538.7	38.44	4.95	13.15		11.84		17.15				0.57	11.40	0.12	0.03	97.59
6	PL-40-556.3	38.23		13.49		15.17		20.41				0.65	5.54	0.46	0.10	93.85
7	PL-40-567.5	37.44	2.60	11.60		22.13		11.16					11.19	1.42	0.32	97.22
8	PL-40-582.2	37.42	5.77	13.68		15.54		14.10					11.52	0.28	0.06	98.25
9	PL-40-582.2	37.29	5.79	13.23		15.34		13.90					11.30	0.33	0.07	97.11
10	PL-40-582.2	38.08	4.29	12.11		15.94		14.33				0.81	11.48	0.83	0.19	97.68
11	PL-40-582.2	39.21	4.70	13.17		15.89		14.99					11.67	0.41	0.09	99.95
12	PL-40-549.8	39.36	1.10	15.17		10.90		19.73				1.42	7.56	0.36	0.08	95.52
13	PL-41-214.5	39.69	0.28	14.45		13.95		18.71	0.78				8.73	0.84	0.19	97.24
14	PL-41-214.5	37.50		15.87		13.38	0.30	21.31					6.35	0.76	0.17	95.30
15	PL-41-214.5	39.19		16.08		13.20		18.87					8.55	0.77	0.17	96.49
16	PL-41-214.5	36.39	2.69	12.75		15.81		15.06					9.44	0.59	0.13	92.60
17	PL-41-306	38.14	7.44	14.34		10.43		17.50				0.73	11.20	0.22	0.05	99.95
18	PL-41-306	36.56	6.69	13.62		11.93		16.43				0.59	11.21	0.30	0.07	97.26
19	PL-41-306	36.71	7.26	14.23		12.77		15.36					11.30	0.26	0.06	97.83
20	PL-41-322.3	36.37	6.92	13.45		15.30		13.20					12.00	0.25	0.06	97.43
21	PL-41-329.2	34.72	5.59	11.87		17.87		11.14				0.51	11.25	0.30	0.07	93.18
22	PL-41-372.4	38.38	6.01	13.51		11.82		17.18					11.20	0.28	0.06	98.32
23	PL-41-372.4	36.88	7.22	12.47		12.32		15.37					10.72	0.15	0.03	95.10
24	PL-41-372.4	36.45	7.51	12.98		12.41		15.34					11.25	0.21	0.05	96.10
25	PL-42-331.5	37.35	1.62	13.93		10.78		18.42				0.61	10.53	0.21	0.05	93.40
26	PL-42-331.5	39.49		11.60		11.13		23.02	0.67			0.69	5.17	0.46	0.10	92.13
27	PL-42-331.5	37.72	3.27	11.94		12.80		16.73			0.42		10.30	0.28	0.06	93.40

28	PL-42-331.5	38.34	0.53	13.66		10.20	21.24			8.35	0.27	0.06	92.53
29	PL-51-185.8	36.43	6.91	12.02		17.90	12.54		0.69	11.34	0.17	0.04	97.96
30	PL-54-299.1	37.93	1.85	15.42		14.02	17.01		0.51	11.02	0.45	0.10	98.11
31	PL-54-299.1	36.54	4.77	15.08	0.44	14.10	15.37		0.63	10.81	0.36	0.08	98.02
32	PL-54-299.1	40.31	0.97	12.47		11.40	18.94			9.30	0.19	0.04	93.54
33	PL-54-299.1	38.10	0.83	14.57		12.49	17.93		0.84	9.66	0.37	0.08	94.71
34	PL-54-299.1	38.51		14.87		12.81	18.19			7.72	0.60	0.14	92.56
35	PL-54-299.1	38.19	0.50	15.21		12.43	18.62	0.95	0.82	5.75	0.60	0.14	92.93
36	PL-54-299.1	35.71	4.02	15.00		13.06	15.26		0.89	10.23	0.32	0.07	94.42
37	WF-211-1365.7	37.76	1.15	11.85		17.29	16.67		0.49	7.37		0.00	92.58
38	WF-211-1411.7	38.77	3.69	13.53	0.28	9.31	19.80		0.70	10.94	0.12	0.03	97.11
39	WF-211-1411.7	37.67	7.36	12.74		11.46	16.40		0.49	10.84		0.00	96.96
40	WF-211-1411.7	39.69	6.32	13.21		9.64	18.99			11.05		0.00	98.90
41	WF-211-1411.7	38.66	6.17	12.98		9.97	18.11			10.61		0.00	96.50
42	WF-211-1416.9	38.62	4.25	12.77	0.29	9.89	20.31		0.89	9.50	0.11	0.02	96.61
43	WF-211-1416.9	38.96	5.39	13.36		9.47	19.10		0.85	10.18		0.00	97.31
44	WF-211-1416.9	41.40		14.00		9.19	22.60		0.94	10.72	0.35	0.08	99.12
45	WF-211-1416.9	38.47	4.67	12.47		11.31	19.39		0.70	9.17	0.14	0.03	96.29
46	WF-211-1416.9	38.36	7.31	12.53		11.46	16.68		0.66	11.13	0.10	0.02	98.21
47	WF-211-1416.9	39.02	7.84	12.75		11.53	16.73			11.37		0.00	99.24

Results of point analyses are listed in weight %. Figure 1 gives the location of the drill holes sampled.

SUPPLEMENTARY TABLE 6. THE COMPOSITION OF Cl-BEARING CALCIC AND Na-Ca AMPHIBOLES IN OUR NORILSK SUITES

#	borehole, depth	SiO_2	TiO_2	Al_2O_3	V_2O_3	FeO_{tot}	MnO	MgO	CaO	Na_2O	K_2O	Cl	Cl≡O	Total
1	PL-39-544.4	49.10		4.06		20.94	0.32	10.35	11.25		0.29	0.40	0.09	96.62
2	PL-40-554.5	44.80		10.22		11.95		14.89	11.14	1.90		0.90	0.20	95.60
3	PL-40-554.5	45.83		10.13		13.06	0.71	14.26	11.04	1.78		0.24	0.05	97.00
4	PL-40-554.5	45.68		11.85		9.88		15.54	12.20	2.09		0.33	0.07	97.50
5	PL-40-554.5	49.46		9.56		8.53	0.46	17.86	11.80	1.82		0.09	0.02	99.56
6	PL-40-554.5	42.92		13.68		12.65		13.65	11.74	2.16		0.52	0.12	97.20
7	PL-40-554.5	45.38		12.94		12.65	0.50	14.24	11.08	1.93		0.35	0.08	98.99
8	PL-40-554.5	46.62		9.69		13.02	0.43	15.65	10.23	1.44		0.20	0.05	97.23
9	PL-40-554.5	46.30		10.28		11.64	0.63	15.64	10.77	1.59		0.28	0.06	97.07
10	PL-40-554.5	48.20		8.60		10.51		17.18	11.43	1.68		0.22	0.05	97.77
11	PL-40-554.5	44.07		14.45		13.08	0.36	13.80	11.67	2.29		0.65	0.15	100.22
12	PL-40-554.5	51.71	0.33	4.97		15.52	0.27	13.78	11.77	0.75		0.21	0.05	99.26
13	PL-40-554.5	48.26		8.86		11.60	0.68	16.05	10.69	1.52		0.20	0.05	97.81
14	PL-40-556.3	50.08		4.93		18.72	0.61	12.44	10.24	0.67		0.45	0.10	98.04
15	PL-40-556.3	49.01		8.31		13.29		16.73	9.50	1.77		0.49	0.11	98.99
16	PL-40-556.3	49.03		9.43		10.88		16.57	11.40	1.97		0.41	0.09	99.60
17	PL-40-556.3	49.55		6.14		18.41		15.07	7.07	0.81	0.20	1.04	0.24	98.05
18	PL-40-556.3	51.56	0.70	3.95		14.55		15.72	10.73	1.01		0.20	0.05	98.37
19	PL-40-556.3	45.31		10.18		17.20	0.49	11.48	10.69	1.74		0.82	0.19	97.72
20	PL-40-556.3	45.10		10.68		17.46		11.72	11.14	1.78		0.73	0.16	98.45
21	PL-40-556.3	48.07		8.31		13.20		14.68	11.45	1.60		0.34	0.08	97.57
22	PL-40-556.3	49.76		6.80		11.82		16.45	11.81	1.23	0.27	0.27	0.06	98.35
23	PL-40-567.5	43.22		8.09		25.22		6.53	11.04	1.67	0.88	2.86	0.65	98.86
24	PL-40-567.5	42.83		8.52		25.01	0.32	6.62	10.97	1.70	0.71	2.91	0.66	98.93
25	PL-40-567.5	50.64	0.43	6.10		16.11		11.69	10.42	1.67	0.28	0.64	0.14	97.84
26	PL-40-567.5	45.61		6.56		24.02		8.09	10.83	1.43	0.53	2.23	0.50	98.80

27	PL-40-567.5	47.88		5.27		21.57	0.26	9.93	11.05	1.23	0.34	1.59	0.36	98.76
28	PL-40-567.5	45.95		6.71		23.07		8.72	11.19	1.23	0.47	2.17	0.49	99.02
29	PL-40-567.5	51.43		1.80		24.93	0.52	11.96	6.93			0.75	0.17	98.15
30	PL-40-567.5	51.17	0.52	4.97		11.80	0.26	17.03	11.12	1.19		0.25	0.06	98.25
31	PL-40-567.5	49.27	0.53	4.80		11.73		15.99	13.01	1.12		0.27	0.06	96.66
32	PL-40-573.1	45.27		8.73		11.64		15.79	9.60	1.77		0.24	0.05	92.99
33	PL-40-573.1	43.96	1.17	11.05	0.43	13.20		12.90	11.40	2.33	0.17	0.52	0.12	97.01
34	PL-40-573.1	50.34		4.80		16.83		14.56	9.08	0.77		0.50	0.11	96.77
35	PL-40-573.1	42.51	1.12	7.27		17.29		10.53	11.74	1.71	0.24	0.98	0.22	93.17
36	PL-40-573.1	45.12	0.75	9.03		16.33		12.37	10.47	1.74		0.43	0.10	96.14
37	PL-40-573.1	51.02		2.89		13.15		15.09	11.67	0.50		0.25	0.06	94.51
38	PL-40-573.1	42.66	0.93	8.92		19.90		9.47	10.59	1.77	0.29	0.96	0.22	95.27
39	PL-40-582.2	53.63		4.69		10.96	0.40	17.79	12.12		0.36	0.15	0.03	100.07
40	PL-40-582.2	52.74		5.20		11.21	0.41	17.23	11.80	0.82	0.47	0.13	0.03	99.98
41	PL-40-582.2	54.96		2.87		11.41	0.56	18.04	11.18	0.42	0.24	0.15	0.03	99.80
42	PL-40-549.8	48.31		9.56		13.03		14.87	11.61	1.71		0.34	0.08	99.35
43	PL-40-549.8	52.26		2.95		21.99	0.58	14.51	5.14			0.23	0.05	97.61
44	PL-40-549.8	43.69		13.87		12.00		13.03	9.88	2.24	1.02	0.73	0.16	96.30
45	PL-40-549.8	38.98		10.47		26.93		4.26	11.29	1.44	2.19	4.65	1.05	99.16
46	PL-40-549.8	43.49		8.11		25.79	0.41	6.02	10.89	1.25	1.47	3.22	0.73	99.92
47	PL-40-549.8	43.64		8.69		21.91		8.09	11.17	1.66	0.48	2.02	0.46	97.20
48	PL-40-549.8	46.40		10.51		10.43		15.46	11.85	2.06		0.34	0.08	96.97
49	PL-40-549.8	53.93		3.00		8.08		19.87	11.52			0.12	0.03	96.49
50	PL-40-549.8	41.95		12.79		16.80		10.15	11.47	2.09	0.19	0.99	0.22	96.21
51	PL-40-549.8	44.31		12.15		13.01	0.26	14.11	10.17	2.12		0.52	0.12	96.53
52	PL-41-214.5	43.39		14.21		17.55		10.26	11.87	2.53	0.52	2.15	0.49	101.99
53	PL-41-214.5	43.34		13.53		15.64		11.84	12.31	2.45	0.49	1.34	0.30	100.64
54	PL-41-214.5	47.34		11.05		13.05	0.32	14.89	11.07	2.10	0.24	0.40	0.09	100.37
55	PL-41-214.5	49.08		10.07		12.54		15.57	11.46	1.83	0.23	0.38	0.09	101.07
56	PL-41-214.5	46.10		11.02		13.24	0.30	14.49	11.12	2.01	0.28	0.41	0.09	98.88
57	PL-41-214.5	47.73	1.25	7.73		15.22		13.25	11.22	1.56	0.49	0.31	0.07	98.69
58	PL-41-329.2	35.83		12.45		29.27		2.14	11.49	0.90	3.87	4.55	1.03	99.47
59	PL-41-329.2	36.45		13.00		28.10		2.04	11.68	0.94	3.77	4.09	0.92	99.15

60	PL-41-372.4	36.80	0.93	12.43	27.04	0.74	2.40	11.40	0.71	3.08	1.77	0.40	96.90
61	PL-41-372.4	37.20	0.50	12.49	25.18	0.45	4.20	11.52	0.94	2.61	0.96	0.22	95.83
62	PL-41-372.4	36.30	1.07	12.04	27.69	0.65	2.47	11.40	0.75	3.07	1.84	0.42	96.86
63	PL-41-372.4	37.70	0.28	13.25	25.47	0.56	3.85	11.73	1.13	2.17	1.20	0.27	97.07
64	PL-41-372.4	36.93	0.90	13.11	26.30	0.62	2.57	11.49	0.84	2.89	1.63	0.37	96.91
65	PL-41-372.4	36.35	0.90	12.98	27.22	0.71	2.35	11.31	0.86	3.17	1.87	0.42	97.30
66	PL-41-372.4	51.71	1.05	4.16	7.82	0.37	17.78	12.22	1.08	0.27	0.12	0.03	96.55
67	PL-41-372.4	35.77	1.60	13.68	26.67	0.75	2.22	11.21	0.75	3.42	2.01	0.45	97.63
68	PL-41-372.4	35.68	1.30	12.53	27.15	0.89	2.01	11.50	0.92	3.23	1.86	0.42	96.65
69	PL-43-349.4	45.93	0.40	9.86	14.41		12.84	10.75	1.56		0.59	0.13	96.21
70	PL-43-349.4	44.35	1.15	11.51	12.12		14.39	10.96	2.22	0.57	0.29	0.07	97.49
71	PL-43-349.4	43.62	1.53	11.47	12.48		14.15	11.50	2.05	0.82	0.25	0.06	97.81
72	PL-43-349.4	44.09	1.87	11.20	11.71		14.71	11.46	2.36	0.67	0.27	0.06	98.28
73	PL-43-349.4	44.56	1.48	10.52	11.89		14.69	11.21	2.10	0.61	0.27	0.06	97.27
74	PL-43-349.4	44.20	1.57	11.11	11.81		14.76	11.54	2.25	0.73	0.27	0.06	98.18
75	PL-39-351.4	43.45	2.90	9.75	9.57		14.84	11.71	2.21	0.70	0.25	0.06	95.32
76	PL-39-351.4	42.10	2.59	11.22	11.28		14.43	10.58	2.32	0.61	0.27	0.06	95.34
77	PL-39-351.4	42.72	1.88	10.45	9.56		15.24	11.05	2.04	0.76	0.22	0.05	93.87
78	PL-39-351.4	45.85		10.73	10.51	0.23	16.62	10.38	2.29		0.24	0.05	96.80
79	PL-39-351.4	41.82	2.80	10.88	11.31		14.21	10.80	2.20	0.88	0.20	0.05	95.05
80	PL-39-351.4	45.59	1.33	8.96	10.27		16.25	11.47	2.13	0.57	0.25	0.06	96.76
81	PL-39-351.4	44.56	2.42	9.20	10.51		14.92	11.73	2.26	0.54	0.23	0.05	96.32
82	PL-39-351.4	43.79	1.88	9.60	11.67		14.81	10.86	2.14	0.63	0.11	0.02	95.47
83	PL-39-351.4	42.25	2.09	11.47	11.10		14.21	11.31	2.16	0.64	0.21	0.05	95.39
84	PL-39-351.4	42.66	1.75	11.53	10.74		15.24	11.00	1.98	0.67	0.35	0.08	95.84
85	PL-39-351.4	43.81	2.42	11.07	11.27		14.78	11.50	2.36	0.96	0.21	0.05	98.33
86	PL-39-351.4	38.85	1.42	10.30	10.20		13.55	14.90	2.14	0.72	0.86	0.19	92.75
87	PL-39-351.4	41.93	2.25	11.39	11.19		14.10	11.08	2.28	0.69	0.24	0.05	95.10
88	PL-39-351.4	42.92		12.58	12.04		13.95	9.96	2.31		0.45	0.10	94.11
89	PL-39-351.4	42.96	1.67	10.83	10.76		14.53	11.07	2.49	0.36	0.19	0.04	94.82
90	PL-39-351.4	43.41	0.85	11.79	11.00		14.99	11.05	2.20	0.49	0.25	0.06	95.97
91	PL-54-299.1	37.22	2.12	14.79	15.81		15.27	4.95	1.31	0.42	0.18	0.04	92.03

#	Name	Si	Ti	Al	V	Fe^{3+}	Fe^{2+}	Mn	Mg	Ca	Na	K	Cl
1	Mhbl	7.43	0.00	0.72	0	0.36	2.29	0.04	2.33	1.82	0.00	0.06	0.10
2	Ed	6.66	0.00	1.79	0	0.35	1.13	0.00	3.30	1.77	0.55	0.00	0.23
3	Ed	6.72	0.00	1.75	0	0.32	1.29	0.09	3.12	1.73	0.51	0.00	0.06
4	Mhbl	6.52	0.00	1.99	0	0.66	0.52	0.00	3.31	1.87	0.58	0.00	0.08
5	Mhbl	6.90	0.00	1.57	0	0.14	0.86	0.05	3.71	1.76	0.49	0.00	0.02
6	Prg	6.28	0.00	2.36	0	0.47	1.07	0.00	2.98	1.84	0.61	0.00	0.13
7	Prg	6.50	0.00	2.18	0	0.28	1.23	0.06	3.04	1.70	0.54	0.00	0.09
8	Mhbl	6.75	0.00	1.65	0	0.44	1.14	0.05	3.38	1.59	0.40	0.00	0.05
9	Mhbl	6.71	0.00	1.76	0	0.38	1.03	0.08	3.38	1.67	0.45	0.00	0.07
10	Mhbl	6.89	0.00	1.45	0	0.31	0.94	0.00	3.66	1.75	0.47	0.00	0.05
11	Prg	6.27	0.00	2.42	0	0.40	1.15	0.04	2.93	1.78	0.63	0.00	0.16
12	Mhbl	7.45	0.04	0.84	0	0.00	1.87	0.03	2.96	1.82	0.21	0.00	0.05
13	Mhbl	6.94	0.00	1.50	0	0.20	1.19	0.08	3.44	1.65	0.42	0.00	0.05
14	Mhbl	7.40	0.00	0.86	0	0.16	2.15	0.08	2.74	1.62	0.19	0.00	0.11
15	Mhbl	7.00	0.00	1.40	0	0.11	1.47	0.00	3.56	1.45	0.49	0.00	0.12
16	Mhbl	6.79	0.00	1.54	0	0.98	0.28	0.00	3.42	1.69	0.53	0.00	0.10
17	Mhbl	7.27	0.00	1.06	0	0.13	2.13	0.00	3.30	1.11	0.23	0.04	0.26
18	Mhbl	7.45	0.08	0.67	0	0.00	1.76	0.00	3.39	1.66	0.28	0.00	0.05
19	Ed	6.75	0.00	1.79	0	0.21	1.94	0.06	2.55	1.71	0.50	0.00	0.21
20	Ed	6.65	0.00	1.86	0	0.33	1.82	0.00	2.58	1.76	0.51	0.00	0.18
21	Mhbl	7.00	0.00	1.43	0	0.13	1.48	0.00	3.19	1.79	0.45	0.00	0.08
22	Mhbl	7.12	0.00	1.15	0	0.22	1.19	0.00	3.51	1.81	0.34	0.05	0.07
23	Fed	6.72	0.00	1.48	0	0.71	2.57	0.00	1.51	1.84	0.50	0.18	0.75
24	Fhbl	6.63	0.00	1.56	0	0.88	2.36	0.04	1.53	1.82	0.51	0.14	0.76
25	Mhbl	7.39	0.05	1.05	0	0.29	1.68	0.00	2.54	1.63	0.47	0.05	0.16
26	Fhbl	6.94	0.00	1.18	0	0.90	2.16	0.00	1.83	1.76	0.42	0.10	0.58
27	Fhbl	7.26	0.00	0.94	0	0.12	2.61	0.03	2.24	1.79	0.36	0.07	0.41
28	Fhbl	7.02	0.00	1.21	0	0.29	2.66	0.00	1.99	1.83	0.36	0.09	0.56
29	Fhbl	7.71	0.00	0.32	0	0.27	2.86	0.07	2.67	1.11	0.00	0.00	0.19

30	Mhbl	7.32	0.06	0.84	0	0.07	1.34	0.03	3.63	1.71	0.33	0.00	0.06
31	Mhbl	7.20	0.06	0.83	0	0.27	1.17	0.00	3.48	2.04	0.32	0.00	0.07
32	Ed	6.85	0.00	1.56	0	0.22	1.25	0.00	3.56	1.56	0.52	0.00	0.06
33	Prg	6.48	0.13	1.92	0.05	0.40	1.23	0.00	2.84	1.80	0.67	0.03	0.13
34	Prg	7.44	0.00	0.84	0	0.07	2.01	0.00	3.21	1.44	0.22	0.00	0.13
35	Ed	6.73	0.13	1.36	0	0.35	1.94	0.00	2.49	1.99	0.53	0.05	0.26
36	Ed	6.79	0.09	1.60	0	0.14	1.92	0.00	2.78	1.69	0.51	0.00	0.11
37	Act	7.62	0.00	0.51	0	0.11	1.54	0.00	3.36	1.87	0.15	0.00	0.06
38	Mhbl	6.55	0.11	1.62	0	1.00	1.56	0.00	2.17	1.74	0.53	0.06	0.25
39	Mhbl	7.44	0.00	0.77	0	0.30	0.98	0.05	3.68	1.80	0.00	0.06	0.04
40	Mhbl	7.40	0.00	0.86	0	0.04	1.28	0.05	3.60	1.77	0.22	0.08	0.03
41	Act	7.69	0.00	0.47	0	0.00	1.34	0.07	3.76	1.68	0.11	0.04	0.04
42	Mhbl	6.90	0.00	1.61	0	0.13	1.43	0.00	3.16	1.78	0.47	0.00	0.08
43	Mhbl	7.70	0.00	0.51	0	0.08	2.63	0.07	3.19	0.81	0.00	0.00	0.06
44	Tsr	6.35	0.00	2.37	0	1.04	0.42	0.00	2.82	1.54	0.63	0.19	0.18
45	Hst	6.32	0.00	2.00	0	0.53	3.12	0.00	1.03	1.96	0.45	0.45	1.28
46	Fhbl	6.74	0.00	1.48	0	0.77	2.57	0.05	1.39	1.81	0.38	0.29	0.85
47	Fhbl	6.73	0.00	1.58	0	0.67	2.16	0.00	1.86	1.85	0.50	0.09	0.53
48	Mhbl	6.66	0.00	1.78	0	0.68	0.57	0.00	3.31	1.82	0.57	0.00	0.08
49	Act	7.62	0.00	0.50	0	0.26	0.69	0.00	4.18	1.74	0.00	0.00	0.03
50	Mhbl	6.33	0.00	2.27	0	0.72	1.40	0.00	2.28	1.85	0.61	0.04	0.25
51	Ed	6.54	0.00	2.11	0	0.21	1.40	0.03	3.10	1.61	0.61	0.00	0.13
52	Prg	6.26	0.00	2.42	0	0.59	1.53	0.00	2.21	1.84	0.71	0.10	0.53
53	Mhst	6.26	0.00	2.30	0	0.59	1.30	0.00	2.55	1.91	0.69	0.09	0.33
54	Mhbl	6.57	0.00	1.81	0	1.17	0.35	0.04	3.08	1.65	0.57	0.04	0.09
55	Mhbl	6.74	0.00	1.63	0	0.99	0.45	0.00	3.19	1.69	0.49	0.04	0.09
56	Ed	6.65	0.00	1.88	0	0.20	1.39	0.04	3.12	1.72	0.56	0.05	0.10
57	Mhbl	6.87	0.14	1.31	0	0.68	1.15	0.00	2.85	1.73	0.44	0.09	0.08
58	Hst	5.94	0.00	2.43	0	0.58	3.48	0.00	0.53	2.04	0.29	0.82	1.28
59	Fprg	6.02	0.00	2.53	0	0.34	3.55	0.00	0.50	2.07	0.30	0.79	1.15
60	Fprg	6.06	0.12	2.41	0	0.35	3.38	0.10	0.59	2.01	0.23	0.65	0.49
61	Hst	6.05	0.06	2.39	0	0.55	2.88	0.06	1.02	2.01	0.30	0.54	0.26
62	Hst	6.00	0.13	2.34	0	0.47	3.35	0.09	0.61	2.02	0.24	0.65	0.52

63	Hst	6.04	0.03	2.50	0	0.55	2.86	0.08	0.92	2.01	0.35	0.44	0.33
64	Fprg	6.05	0.11	2.53	0	0.26	3.34	0.09	0.63	2.02	0.27	0.60	0.45
65	Fprg	5.97	0.11	2.51	0	0.42	3.32	0.10	0.58	1.99	0.27	0.66	0.52
66	Mhbl	7.41	0.11	0.70	0	0.16	0.78	0.05	3.80	1.88	0.30	0.05	0.03
67	Fprg	5.86	0.20	2.64	0	0.35	3.30	0.10	0.54	1.97	0.24	0.72	0.56
68	Fprg	5.93	0.16	2.46	0	0.37	3.41	0.13	0.50	2.05	0.30	0.69	0.52
69	Mhbl	6.85	0.05	1.73	0	0.02	1.77	0.00	2.86	1.72	0.45	0.00	0.15
70	Tsr	6.38	0.12	1.95	0	0.94	0.52	0.00	3.09	1.69	0.62	0.11	0.07
71	Mhst	6.31	0.17	1.96	0	0.79	0.72	0.00	3.05	1.78	0.58	0.15	0.06
72	Mhst	6.34	0.20	1.90	0	0.71	0.70	0.00	3.15	1.77	0.66	0.12	0.07
73	Tsr	6.44	0.16	1.79	0	0.83	0.61	0.00	3.17	1.74	0.59	0.11	0.07
74	Mhst	6.36	0.17	1.88	0	0.74	0.68	0.00	3.17	1.78	0.63	0.13	0.07
75	Prg	6.47	0.33	1.71	0	0.18	1.01	0.00	3.30	1.87	0.64	0.13	0.06
76	Tsr	6.20	0.29	1.95	0	0.95	0.44	0.00	3.17	1.67	0.66	0.12	0.07
77	Mhst	6.37	0.21	1.84	0	0.73	0.46	0.00	3.39	1.77	0.59	0.15	0.06
78	Ed	6.65	0.00	1.84	0	0.22	1.06	0.03	3.60	1.61	0.64	0.00	0.06
79	Mhst	6.22	0.31	1.91	0	0.78	0.63	0.00	3.15	1.72	0.64	0.17	0.05
80	Mhbl	6.59	0.15	1.53	0	0.76	0.49	0.00	3.50	1.78	0.60	0.11	0.06
81	Ed	6.56	0.27	1.60	0	0.29	1.01	0.00	3.28	1.85	0.65	0.10	0.06
82	Tsr	6.44	0.21	1.67	0	0.88	0.56	0.00	3.25	1.71	0.61	0.12	0.03
83	Mhst	6.26	0.23	2.00	0	0.69	0.68	0.00	3.14	1.79	0.62	0.12	0.05
84	Tsr	6.21	0.19	1.98	0	1.10	0.21	0.00	3.31	1.72	0.56	0.12	0.09
85	Mhst	6.32	0.26	1.88	0	0.57	0.79	0.00	3.18	1.78	0.66	0.18	0.05
86	Mhst	6.02	0.17	1.88	0	0.96	0.37	0.00	3.13	2.48	0.64	0.14	0.23
87	Mhst	6.24	0.25	2.00	0	0.71	0.68	0.00	3.13	1.77	0.66	0.13	0.06
88	Prg	6.49	0.00	2.24	0	0.11	1.41	0.00	3.14	1.61	0.68	0.00	0.12
89	Mhst	6.37	0.19	1.89	0	0.69	0.65	0.00	3.21	1.76	0.72	0.07	0.05
90	Tsr	6.31	0.09	2.02	0	1.03	0.30	0.00	3.25	1.72	0.62	0.09	0.06
91	Tsr	5.72	0.25	2.68	0	0.91	1.13	0.00	3.50	0.82	0.39	0.08	0.05

The compositions were recalculated on the basis of charge balance and 23 atoms of oxygen in the formula unit. Symbols used: Act: actinolite, Ed: edenite, Fed: ferro-edenite, Fhbl: ferro-hornblende, Fprg: ferro-pargasite, Hst: hastingsite, Mhst: magnesio-hastingsite, Mhbl: magnesio-hornblende, Prg: pargasite, Tsr: tschermakite. Figure 1 gives the location of the drill holes sampled.

SUPPLEMENTARY TABLE 7. THE COMPOSITION OF ILMENITE, TITANITE, ANHYDRITE AND GARNET OF THE ANDRADITE–GROSSULAR SERIES IN OUR NORILSK SUITES

#	borehole, depth	SiO_2	TiO_2	Al_2O_3	FeO (total)	MnO	MgO	CaO	SO_3	Total
					Ilmenite					
1	PL-39-538.7	0.26	52.36		45.12	1.58	0.61			99.93
2	PL-39-544.4		51.66		46.84	0.68				99.18
3	PL-40-573.1		51.16		45.55	0.99				97.70
4	PL-40-573.1		52.13		44.51	0.63	1.11			98.38
5	PL-40-549.8		49.66		47.29	0.49	2.57			100.01
6	PL-41-214.5		51.54		47.24					98.78
7	PL-41-322.3	1.01	47.77	0.49	46.01	1.76	1.54			98.58
8	PL-41-372.4		51.23		40.51	4.73	2.52			98.99
9	PL-41-372.4		52.29		38.70	4.97	4.48			100.44
10	PL-41-388.2	0.64	45.79		46.44	4.44	1.59			98.90
11	PL-54-299.1	0.19	43.52	1.15	50.84	1.19	0.80			97.69
12	WF-211-1416.9		47.14		48.27	1.41	2.47			99.88
					Titanite					
13	PL-41-372.4	30.87	35.13	3.42	1.71			29.06		100.19
14	PL-41-372.4	31.11	33.81	4.08	1.87			28.75		99.62
15	PL-41-372.4	30.68	36.18	3.16	1.25			28.98		100.25
16	PL-40-554.5	33.31	31.93	5.59	1.61			29.09		101.53
					Anhydrite					
17	PL-40-582.2				0.85			42.45	59.26	102.56
18	PL-40-582.2				0.94			41.61	57.44	99.99
19	PL-41-372.4							39.59	60.00	99.59
20	PL-41-372.4							40.20	60.17	100.37
21	WF-209-576.4							38.66	60.94	99.60
22	WF-209-576.4							39.71	59.90	99.62
					Garnet					
23	PL-40-582.2	37.03		4.31	22.45			34.87		98.66
24	WF-209-576.4	35.56		10.01	15.32			36.31		97.20
25	WF-209-576.4	36.99		12.77	11.71			36.65		98.11
26	WF-209-576.4	33.89		0.49	26.67			34.00		95.05

Results of analyses of ilmenite, titanite, anhydrite and garnet of the andradite–grossular series are expressed in weight %. Figure 1 gives the location of the drill holes sampled.

SUPPLEMENTARY TABLE 8. THE COMPOSITION OF MONAZITE-(Ce), THORITE, ZIRCON AND BADDELEYITE IN OUR NORILSK SUITES

Monazite-(Ce)

#	borehole, depth	P_2O_5	ThO_2	SiO_2	Sm_2O_3	Nd_2O_3	Ce_2O_3	La_2O_3	Pr_2O_3	Gd_2O_3	Al_2O_3	FeO	MgO	CaO	K_2O	Total
1	PL-39-538.7	31.92		1.54		10.14	33.08	20.50	3.18			0.95	0.90	1.01		103.22
2	PL-40-549.8	21.68	25.38		1.52	8.71	22.93	12.36	2.88			1.61		1.05		98.12
3	PL-40-549.8	28.83	3.16	2.35	1.25	7.13	31.72	23.74	2.41			1.52		0.73		102.84
4	PL-41-329.2	22.78	8.42	4.32		4.15	32.32	21.73	2.75		0.79	0.78		0.27	0.36	98.67
5	PL-54-299.1	33.29		0.64	2.09	12.38	31.78	15.64	3.35	1.36		0.63		0.71		101.87

Thorite

#	borehole, depth	P_2O_5	ThO_2	SiO_2	TiO_2	ZrO_2	UO_2	Nd_2O_3	Ce_2O_3	La_2O_3	Pr_2O_3	Al_2O_3	FeO	MgO	CaO	Total
6	PL-41-214.5		61.37	19.83	2.25		2.84						3.22	0.56	6.27	96.34
7	PL-41-306		78.14	18.46								0.40	1.25		0.99	99.24
8	PL-41-306		70.62	19.15			3.71					1.06	1.48		5.41	101.43
9	PL-41-306		55.69	16.88	0.45	2.40	5.54					1.40	1.16		6.65	90.17
10	PL-41-329.2	6.10	59.63	13.44				3.28	6.17	2.58	1.19		1.43			93.82
11	WF-211-1411.7	0.62	69.26	17.84									2.01		4.37	94.10

Zircon and Baddeleyite

#		borehole, depth	SiO_2	ZrO_2	HfO_2	TiO_2	ThO_2	UO_2	FeO	Total
12	Bdy	PL-39-544.4		98.04		1.97				100.01
13		PL-39-544.4		98.24	0.29	1.47				100.00
14		PL-40-554.5		103.44						103.44
15	Zrn	PL-40-554.5	30.34	66.38				0.96		97.68
16	Bdy	PL-40-567.5		94.84	3.59	0.42			1.16	100.01
17	Zrn	PL-40-567.5	30.98	66.32	1.96				0.75	100.01
18		PL-40-567.5	30.64	66.62	1.90				0.84	100.00
19		PL-40-567.5	30.59	66.31	2.11				1.00	100.01
20		PL-40-549.8	29.99	60.03			2.34	2.10	0.60	95.06
21	Bdy	PL-40-549.8		97.85	1.53				0.62	100.00
22		PL-40-549.8		97.93	1.56				0.51	100.00
23		PL-40-549.8		97.64	1.73				0.63	100.00
24	Zrn	PL-41-214.5	29.87	67.54	1.34	0.5			0.73	99.98
25		PL-41-306	30.27	68.09	0.94				0.69	99.99
26		PL-41-306	30.38	68.28	0.85				0.50	100.01
27		PL-41-306	29.87	68.24	1.08				0.82	100.01
28	Bdy	PL-41-322.3		96.99	1.95	0.73			0.33	100.00
29		PL-41-322.3		97.24	1.56	0.83			0.36	99.99
30		PL-41-329.2		95.99	2.9	0.58			0.54	100.01
31		PL-41-388.2		100.16	3.43					103.59
32		PL-41-388.2		98.84	1.17					100.01
33		WF-211-1365.7		91.92	2.71	1.65			1.97	98.25
34	Zrn	WF-211-1411.7	31.19	68.54					1.00	100.73
35	Bdy	WF-211-1416.9		96.29	1.42	1.57			0.75	100.03
36		WF-211-1416.9		97.08	1.72	0.82			0.77	100.39

The analytical data are expressed in weight %. Symbols used: Zrn: zircon, Bdy: baddeleyite. Figure 1 gives the location of the drill holes sampled.

SUPPLEMENTARY TABLE 9. THE COMPOSITION OF GALENA, CLAUSTHALITE, ALTAITE, HESSITE, ACANTHITE AND NICKELINE IN OUR NORILSK SUITES

#	borehole, depth	Pb	Ag	Cu	Pd	Ni	Fe	S	Se	Te	As	Total
1	PL-40-582.2	87.85						12.89				100.74
2	PL-41-214.5	87.26						12.69				99.95
3	PL-41-214.5	84.91						12.51				97.42
4	PL-41-214.5	79.71						5.11	13.79			98.61
5	PL-41-306	83.91						10.38	2.85			97.14
6	PL-41-306	61.29								38.71		100.00
7	PL-41-306	86.18						11.31	2.29			99.78
8	PL-41-306	76.60						2.03	20.93	1.44		101.00
9	PL-41-372.4	87.26						12.74				100.00
10	PL-41-372.4	87.18						12.82				100.00
11	PL-41-388.2	85.35						12.62				97.97
12	PL-41-388.2	89.16						12.58				101.74
13	PL-41-388.2	84.97						11.98				96.95
14	PL-41-388.2	87.19						12.47				99.66
15	PL-39-351.4	75.15					1.46	2.41	20.72			99.74
16	WF-211-1365.7	86.53						13.47				100.00
17	WF-211-1365.7	87.34						12.08	0.91			100.33
18	WF-211-1365.7	87.75						12.28				100.03
19	WF-211-1365.7	89.07						11.83				100.90
20	PL-40-554.5		58.04		1.07	0.62	2.61	0.89		33.74		96.97
21	PL-39-351.4		85.21					11.70				96.91
22	PL-0051-185.8		86.35	1.28				12.21				99.84
23	PL-40-556.3				1.69	42.88					54.91	99.48
24	PL-40-567.5					41.10					58.90	100.00
25	PL-40-573.1					39.66					58.87	98.53

#	Mineral species	Pb	Ag	Cu	Pd	Ni	Fe	S	Se	Te	As	S+Se +Te
1	Gn	1.03					0.00	0.97	0.00	0.00		0.97
2	Gn	1.03					0.00	0.97	0.00	0.00		0.97
3	Gn	1.02					0.00	0.98	0.00	0.00		0.98
4	Cth–Gn	1.07					0.00	0.44	0.49	0.00		0.93
5	Gn	1.06					0.00	0.85	0.09	0.00		0.94
6	Alt	0.99					0.00	0.00	0.00	1.01		1.01
7	Gn	1.04					0.00	0.88	0.07	0.00		0.96

8	Cth	1.04					0.00	0.18	0.75	0.03		0.96
9	Gn	1.03					0.00	0.97	0.00	0.00		0.97
10	Gn	1.03					0.00	0.97	0.00	0.00		0.97
11	Gn	1.02					0.00	0.98	0.00	0.00		0.98
12	Gn	1.05					0.00	0.95	0.00	0.00		0.95
13	Gn	1.05					0.00	0.95	0.00	0.00		0.95
14	Gn	1.04					0.00	0.96	0.00	0.00		0.96
15	Cth	1.00					0.07	0.21	0.72	0.00		0.93
16	Gn	1.00					0.00	1.00	0.00	0.00		1.00
17	Gn	1.04					0.00	0.93	0.03	0.00		0.96
18	Gn	1.05					0.00	0.95	0.00	0.00		0.95
19	Gn	1.08					0.00	0.92	0.00	0.00		0.92
20	Hes		1.80		0.03	0.04	0.16	0.09		0.88		0.98
21	Aca		2.05	0.00				0.95				
22	Aca		2.00	0.05				0.95				
23	Nc				0.02	0.99					0.99	
24	Nc				0.00	0.94					1.06	
25	Nc				0.00	0.92					1.08	

Compositions are first expressed in weight %, then below, in terms of atoms per formula unit. Values of *apfu* are based on a total of two atoms for galena (Gn), clausthalite (Cth), altaite (Alt) and nickeline (Nc). Those listed for hessite (Hes) and acanthite (Aca) are based on $\Sigma = 3$ *apfu*. Sparse grains of sphalerite or wurtzite correspond to $(Zn_{0.91–0.93}\,Fe_{0.07})_{\Sigma 0.98–1.00}S_{1.00}$ (sample PL-40-582.2). Figure 1 gives the location of the drill holes sampled.

SUPPLEMENTARY TABLE 10. THE COMPOSITION OF GOLD, SILVER, COPPER AND BISMUTH IN OUR NORILSK SUITES

#	borehole, depth	Au	Ag	Pd	Cu	Fe	Ni	Bi	Total
1	PL-40-556.3	59.60	35.79			1.57	2.81		99.77
2	PL-40-573.1	72.63	27.37						100.00
3	PL-40-582.2	74.09	23.81						97.90
4	PL-40-582.2	74.27	24.25						98.52
5	PL-40-582.2	76.62	23.38						100.00
6	PL-40-582.2	76.64	23.36						100.00
7	PL-41-306	56.52	43.48						100.00
8	PL-41-306	72.17	27.51						99.68
9	PL-41-306	62.98	34.61						97.59
10	PL-41-306	70.87	16.26	7.33					94.46
11	PL-41-306	67.02	26.02	6.96					100.00
12	PL-41-306	73.16	19.65	7.20					100.01
13	PL-41-322.3	69.15	21.81	5.59		2.21			98.76
14	PL-41-322.3	71.34	21.21	6.45					99.00
15	PL-41-322.3	60.11	27.48	2.01	3.71	2.54	1.00		96.85
16	PL-42-331.5	53.59	44.50			1.79			99.88
17	PL-42-331.5	45.01	39.45						84.46
18	PL-42-331.5	54.49	42.64						97.13
19	WF-138-292.5	76.27	23.73						100.00
20	WF-138-292.5	83.72	16.28						100.00
21	WF-209-576.4	63.06	33.46	3.48					100.00
22	WF-209-576.4	70.24	22.89	2.81					95.94
23	WF-211-1365.7		100.58						100.58
24	WF-211-1365.7		100.17						100.17
25	WF-211-1365.7		99.40						99.40
26	PL-41-322.3				99.82				99.82
27	PL-41-322.3				98.78				98.78
28	WF-211-1365.7							102.72	102.72

Analytical results are expressed in weight %. Figure 1 gives the location of the drill holes sampled.

SUPPLEMENTARY TABLE 11. THE COMPOSITION OF CHALCOPYRITE IN OUR NORILSK SUITES

#	borehole, depth	Fe	Ni	Cu	S	Total	Fe	Ni	Cu	ΣM	S
1	PL-39-538.7	30.94	3.17	30.03	33.92	98.06	1.04	0.10	0.88	2.02	1.98
2	PL-39-538.7	29.60		33.22	34.20	97.02	1.00		0.99	1.99	2.01
3	PL-39-538.7	30.19		33.79	34.09	98.07	1.01		1.00	2.01	1.99
4	PL-39-544.4	30.81		34.36	34.58	99.75	1.02		1.00	2.01	1.99
5	PL-39-544.4	31.03		33.88	34.09	99.00	1.03		0.99	2.02	1.98
6	PL-39-544.4	31.11		34.47	34.65	100.23	1.02		1.00	2.02	1.98
7	PL-39-544.4	30.61		34.17	34.41	99.19	1.02		1.00	2.01	1.99
8	PL-39-544.4	30.59		34.26	34.56	99.41	1.01		1.00	2.01	1.99
9	PL-39-544.4	31.35		34.88	34.48	100.71	1.03		1.00	2.03	1.97
10	PL-39-544.4	30.81		34.75	34.53	100.09	1.01		1.01	2.02	1.98
11	PL-39-544.4	30.85		34.59	34.83	100.27	1.01		1.00	2.01	1.99
12	PL-39-544.4	31.34		34.81	34.76	100.91	1.02		1.00	2.02	1.98
13	PL-39-544.4	31.00		35.17	34.81	100.98	1.01		1.01	2.02	1.98
14	PL-39-544.4	30.73		35.09	34.96	100.78	1.00		1.01	2.01	1.99
15	PL-40-554.5	29.02		32.90	32.82	94.74	1.01		1.00	2.01	1.99
16	PL-40-554.5	27.72		31.58	30.92	90.22	1.01		1.02	2.03	1.97
17	PL-40-554.5	31.10		34.38	34.52	100.00	1.02		1.00	2.02	1.98
18	PL-40-554.5	30.69		34.35	34.26	99.30	1.02		1.00	2.02	1.98
19	PL-40-554.5	30.88		34.06	34.64	99.58	1.02		0.99	2.01	1.99
20	PL-40-556.3	29.69		33.04	34.00	96.73	1.01		0.98	1.99	2.01
21	PL-40-556.3	30.67		34.80	35.05	100.52	1.00		1.00	2.00	2.00
22	PL-40-556.3	29.49		33.67	34.19	97.35	0.99		1.00	1.99	2.01
23	PL-40-556.3	31.02		34.39	34.58	99.99	1.02		1.00	2.02	1.98
24	PL-40-556.3	29.04		31.45	32.30	92.79	1.03		0.98	2.01	1.99
25	PL-40-556.3	29.92		32.57	33.48	95.97	1.02		0.98	2.00	2.00
26	PL-40-556.3	29.89		33.73	31.22	94.84	1.05		1.04	2.09	1.91
27	PL-40-567.5	31.25		34.49	34.90	100.64	1.02		0.99	2.01	1.99
28	PL-40-567.5	31.00		34.34	34.85	100.19	1.02		0.99	2.01	1.99
29	PL-40-567.5	31.21		35.06	34.86	101.13	1.02		1.00	2.02	1.98
30	PL-40-567.5	31.26		34.40	34.47	100.13	1.03		0.99	2.02	1.98
31	PL-40-567.5	31.33		34.67	34.72	100.72	1.02		1.00	2.02	1.98
32	PL-40-567.5	30.66		34.35	34.52	99.53	1.01		1.00	2.01	1.99
33	PL-40-567.5	30.78		35.03	34.50	100.31	1.01		1.01	2.02	1.98
34	PL-40-573.1	28.98		32.69	32.62	94.29	1.01		1.00	2.02	1.98
35	PL-40-573.1	28.70		32.67	33.91	95.28	0.99		0.99	1.97	2.03
36	PL-40-573.1	28.44		33.07	34.83	96.34	0.96		0.98	1.95	2.05
37	PL-40-573.1	29.74		33.08	33.81	96.63	1.01		0.99	2.00	2.00
38	PL-40-573.1	29.62		32.74	33.59	95.95	1.01		0.98	2.00	2.00
39	PL-40-582.2	31.15		34.11	35.14	100.40	1.02		0.98	2.00	2.00

40	PL-40-582.2	30.51		34.24	34.56	99.31	1.01		1.00	2.01	1.99
41	PL-40-582.2	31.00		34.88	35.46	101.34	1.00		0.99	2.00	2.00
42	PL-40-582.2	31.20		34.35	35.39	100.94	1.01		0.98	2.00	2.00
43	PL-40-582.2	31.12		34.63	35.23	100.98	1.01		0.99	2.00	2.00
44	PL-40-582.2	31.13		34.77	35.41	101.31	1.01		0.99	2.00	2.00
45	PL-40-582.2	31.09		34.82	35.15	101.06	1.01		1.00	2.01	1.99
46	PL-40-582.2	31.25		34.75	35.27	101.27	1.01		0.99	2.01	1.99
47	PL-40-582.2	31.38		35.35	35.45	102.18	1.01		1.00	2.01	1.99
48	PL-40-582.2	30.73		35.36	35.14	101.23	1.00		1.01	2.01	1.99
49	PL-40-549.8	30.77		34.24	34.37	99.38	1.02		1.00	2.02	1.98
50	PL-40-549.8	30.88		34.61	34.52	100.01	1.02		1.00	2.02	1.98
51	PL-40-549.8	30.61		33.90	34.04	98.55	1.02		1.00	2.02	1.98
52	PL-40-549.8	30.43		33.84	33.96	98.23	1.02		1.00	2.02	1.98
53	PL-40-549.8	30.74		33.56	34.22	98.52	1.03		0.98	2.01	1.99
54	PL-41-214.5	31.07		35.41	35.11	101.59	1.01		1.01	2.02	1.98
55	PL-41-214.5	30.79		35.09	35.15	101.03	1.00		1.00	2.01	1.99
56	PL-41-214.5	30.77	0.45	34.05	34.47	99.74	1.02	0.01	0.99	2.02	1.98
57	PL-41-214.5	30.52		33.34	34.57	98.43	1.02		0.98	1.99	2.01
58	PL-41-214.5	30.91		33.68	34.46	99.05	1.03		0.98	2.01	1.99
59	PL-41-214.5	30.77		34.47	34.45	99.69	1.02		1.00	2.02	1.98
60	PL-41-214.5	30.42		34.53	35.33	100.28	0.99		0.99	1.99	2.01
61	PL-41-214.5	30.41		33.86	34.71	98.98	1.01		0.99	2.00	2.00
62	PL-41-214.5	30.45		33.79	34.47	98.71	1.01		0.99	2.00	2.00
63	PL-41-306	30.76		34.26	34.75	99.77	1.01		0.99	2.01	1.99
64	PL-41-306	30.90		34.18	34.92	100.00	1.02		0.99	2.00	2.00
65	PL-41-306	30.97	0.47	34.16	35.05	100.65	1.01	0.01	0.98	2.01	1.99
66	PL-41-306	30.06		34.81	35.13	100.00	0.99		1.00	1.99	2.01
67	PL-41-306	30.74		33.86	35.40	100.00	1.01		0.97	1.98	2.02
68	PL-41-306	30.86		34.76	34.38	100.00	1.02		1.01	2.03	1.97
69	PL-41-306	31.04		34.49	34.70	100.23	1.02		1.00	2.01	1.99
70	PL-41-306	30.94		34.63	34.92	100.49	1.01		1.00	2.01	1.99
71	PL-41-322.3	31.53	1.24	32.86	35.30	100.93	1.02	0.04	0.94	2.00	2.00
72	PL-41-322.3	32.02		34.94	33.43	100.39	1.06		1.02	2.07	1.93
73	PL-41-329.2	29.90		34.09	33.54	97.53	1.01		1.01	2.02	1.98
74	PL-41-329.2	30.45		34.59	35.51	100.55	0.99		0.99	1.98	2.02
75	PL-41-329.2	30.92		35.86	35.17	101.95	1.00		1.02	2.02	1.98
76	PL-41-329.2	30.11		35.07	34.48	99.66	1.00		1.02	2.01	1.99
77	PL-41-329.2	29.90		35.91	34.42	100.23	0.99		1.04	2.02	1.98
78	PL-41-329.2	29.50		33.99	34.52	98.01	0.99		1.00	1.99	2.01
79	PL-41-329.2	30.42		34.38	34.91	99.71	1.00		1.00	2.00	2.00
80	PL-41-372.4	30.48		34.40	33.90	98.78	1.02		1.01	2.03	1.97
81	PL-41-372.4	30.98		34.32	34.01	99.31	1.03		1.00	2.03	1.97
82	PL-41-388.2	29.96		34.16	34.41	98.53	1.00		1.00	2.00	2.00
83	PL-41-388.2	30.48		34.54	35.26	100.28	1.00		0.99	1.99	2.01
84	PL-41-388.2	30.11		34.23	34.68	99.02	1.00		1.00	2.00	2.00
85	PL-41-388.2	30.05		35.01	34.26	99.32	1.00		1.02	2.02	1.98

86	PL-42-331.5	30.34		32.62	33.55	96.51	1.03		0.98	2.01	1.99
87	PL-42-331.5	29.78		33.42	33.26	96.46	1.02		1.00	2.02	1.98
88	PL-42-331.5	30.92		32.85	34.37	98.14	1.03		0.97	2.00	2.00
89	PL-42-331.5	30.30		33.11	33.73	97.14	1.03		0.99	2.01	1.99
90	PL-42-331.5	29.43		34.00	33.35	96.78	1.00		1.02	2.02	1.98
91	PL-39-351.4	26.23		31.96	32.39	90.58	0.95		1.01	1.96	2.04
92	PL-39-351.4	30.19		33.66	34.03	97.88	1.01		0.99	2.01	1.99
93	PL-39-351.4	29.31		33.33	33.37	96.01	1.00		1.00	2.01	1.99
94	PL-39-351.4	29.30		33.37	33.16	95.83	1.01		1.01	2.01	1.99
95	PL-39-351.4	36.71	1.58	26.82	34.42	99.53	1.21	0.05	0.77	2.03	1.97
96	PL-39-351.4	30.57		33.78	34.23	98.58	1.02		0.99	2.01	1.99
97	PL-39-351.4	29.74		32.77	33.35	95.86	1.02		0.99	2.01	1.99
98	PL-39-351.4	30.22		33.16	34.04	97.42	1.02		0.98	2.00	2.00
99	PL-39-351.4	29.66		33.21	33.55	96.42	1.01		1.00	2.01	1.99
100	PL-39-351.4	29.15		33.78	33.36	96.29	1.00		1.02	2.01	1.99
101	PL-51-185.8	29.58		33.57	33.45	96.60	1.01		1.01	2.01	1.99
102	PL-54-299.1	30.59		34.38	34.22	99.19	1.02		1.00	2.02	1.98
103	WF-138-292.5	31.17		34.60	35.42	101.19	1.01		0.99	2.00	2.00
104	WF-138-292.5	32.55		34.23	35.06	101.84	1.05		0.97	2.03	1.97
105	WF-138-292.5	31.35		33.61	35.04	100.00	1.03		0.97	2.00	2.00
106	WF-138-292.5	31.46		34.44	35.53	101.43	1.02		0.98	2.00	2.00
107	WF-211-1365.7	32.79		33.87	32.96	99.62	1.09		0.99	2.09	1.91
108	WF-211-1365.7	34.09		34.17	34.00	102.26	1.11		0.97	2.08	1.92
109	WF-211-1365.7	34.03		30.45	34.82	99.30	1.12		0.88	2.00	2.00
110	WF-211-1416.9	31.04		34.63	34.72	100.39	1.02		1.00	2.02	1.98

Compositions are first expressed in weight % and then, on the right, in terms of atoms per formula unit, for a total of 4 *apfu*. Figure 1 gives the location of the drill holes sampled.

SUPPLEMENTARY TABLE 12. THE COMPOSITION OF PENTLANDITE AND ARGENTOPENTLANDITE IN OUR NORILSK SUITES

#	borehole, depth	Fe	Co	Ni	Cu	Ag	S	Total
1	PL-39-544.4	31.77		33.63			33.13	98.53
2	PL-40-554.5	32.30		34.61			35.58	102.49
3	PL-40-554.5	33.87		31.91			35.11	100.89
4	PL-40-554.5	29.24	1.94	33.23	2.18		32.46	99.05
5	PL-40-556.3	32.40	1.47	33.80			32.64	100.31
6	PL-40-556.3	31.35	1.71	34.31			33.46	100.83
7	PL-40-567.5	32.33	1.28	34.62			33.49	101.72
8	PL-40-573.1	27.41	1.54	34.59			33.98	97.52
9	PL-40-582.2	30.02		36.16			33.55	99.73
10	PL-40-582.2	30.04		36.34			33.61	99.99
11	PL-40-582.2	31.17		34.65			33.57	99.39
12	PL-40-582.2	31.60		35.99			33.67	101.26
13	PL-40-582.2	30.33		36.17			32.74	99.24
14	PL-40-582.2	30.93		35.78			33.46	100.17
15	PL-40-582.2	34.79		32.39			34.22	101.40
16	PL-40-582.2	33.27		35.12			33.78	102.17
17	PL-40-582.2	31.13		36.18			33.60	100.91
18	PL-40-582.2	31.53		35.86			33.80	101.19
19	PL-40-582.2	31.27		36.51			33.71	101.49
20	PL-40-549.8	33.86	1.30	32.70			33.42	101.28
21	PL-40-549.8	33.65	1.14	33.01			33.70	101.50
22	PL-40-549.8	35.51	1.10	29.78			33.29	99.68
23	PL-41-214.5	34.30		33.80			33.55	101.65
24	PL-41-214.5	33.91	0.87	31.34			32.69	98.81
25	PL-41-214.5	33.87	0.75	30.54			32.28	97.44
26	PL-41-306	35.18	0.97	30.50	0.74		33.24	100.63
27	PL-41-306	35.48		30.37	1.19		33.24	100.28
28	PL-41-306	35.27		30.01	1.36		33.39	100.03
29	PL-41-306	36.55		29.62			33.03	99.20
30	PL-41-306	36.10		30.50	0.82		33.22	100.64
31	PL-41-306	35.78	1.16	31.09			33.33	101.36
32	PL-41-306	36.25	0.92	30.35			33.06	100.58
33	PL-41-306	36.37	0.83	30.53	0.89		33.51	102.13
34	PL-41-329.2	34.24		32.74			32.97	99.95
35	PL-41-329.2	33.14		32.39			32.63	98.16
36	PL-41-329.2	31.38		34.96			32.36	98.70
37	PL-41-329.2	34.70	1.00	30.38			33.68	99.76
38	PL-41-372.4	28.88		37.86			32.84	99.58
39	PL-43-349.4	32.25		33.44			33.46	99.15

40	PL-51-185.8	32.97	1.28	33.55		33.12	100.92
41	PL-51-185.8	33.67	0.98	33.31		32.96	100.92
42	PL-51-185.8	32.49	1.78	32.28		33.93	100.48
43	PL-51-185.8	33.06	1.43	32.12		32.84	99.45
44	WF-211-1416.9	35.23	2.47	30.10		33.62	101.42
45	WF-211-1416.9	30.47	10.43	25.65		33.49	100.04
46	WF-211-1416.9	30.76	10.41	26.04		34.50	101.71
47	WF-211-1416.9	30.62	6.93	27.90		32.97	98.42
48	WF-211-1416.9	30.66	7.31	27.32		32.94	98.23
49	WF-211-1416.9	34.25	5.96	27.19		33.06	100.46
50	WF-211-1416.9	35.00	6.29	25.45		32.61	99.35
51	WF-209-576.4	22.98		44.36		33.93	101.27
52	WF-209-576.4	21.30		43.48		33.16	97.94
53	WF-209-576.4	23.17		43.44		32.70	99.31
54	WF-209-576.4	23.31		43.23		33.00	99.54
55	WF-209-576.4	23.69		42.80		33.06	99.55
56	PL-41-214.5	38.83		17.14	13.57	31.42	100.96
57	PL-41-214.5	38.49		16.73	13.74	31.31	100.27
58	PL-41-214.5	38.72		16.43	13.30	31.25	99.70

#	Fe	Co	Ni	Cu	Ag	ΣM	S
1	4.45		4.48			8.92	8.08
2	4.32		4.40			8.72	8.28
3	4.59		4.12			8.71	8.29
4	4.10	0.26	4.44	0.27		9.07	7.93
5	4.48	0.19	4.45			9.13	7.87
6	4.30	0.22	4.48			9.00	8.00
7	4.40	0.17	4.49			9.05	7.95
8	3.85	0.21	4.62			8.68	8.32
9	4.15		4.76			8.91	8.09
10	4.15		4.77			8.92	8.08
11	4.32		4.57			8.89	8.11
12	4.31		4.68			8.99	8.01
13	4.23		4.80			9.04	7.96
14	4.27		4.70			8.96	8.04
15	4.72		4.18			8.91	8.09
16	4.51		4.53			9.03	7.97
17	4.26		4.72			8.98	8.02
18	4.30		4.66			8.96	8.04
19	4.26		4.73			9.00	8.00
20	4.63	0.17	4.25			9.05	7.95

21	4.58	0.15	4.28			9.01	7.99
22	4.91	0.14	3.92			8.98	8.02
23	4.67	0.00	4.38			9.05	7.95
24	4.74	0.12	4.17			9.03	7.97
25	4.80	0.10	4.12			9.03	7.97
26	4.84	0.13	3.99	0.09		9.04	7.96
27	4.89		3.98	0.14		9.02	7.98
28	4.87		3.94	0.16		8.97	8.03
29	5.08		3.92			9.00	8.00
30	4.96		3.99	0.10		9.05	7.95
31	4.88	0.15	4.04			9.07	7.93
32	4.99	0.12	3.97			9.08	7.92
33	4.93	0.11	3.94	0.11		9.08	7.92
34	4.74		4.31			9.05	7.95
35	4.66		4.34			9.00	8.00
36	4.41		4.67			9.08	7.92
37	4.79	0.13	3.99			8.91	8.09
38	4.02		5.01			9.04	7.96
39	4.48		4.42			8.90	8.10
40	4.53	0.17	4.38			9.08	7.92
41	4.63	0.13	4.36			9.11	7.89
42	4.45	0.23	4.21			8.90	8.10
43	4.60	0.19	4.25			9.04	7.96
44	4.80	0.32	3.90			9.02	7.98
45	4.21	1.37	3.37			8.94	8.06
46	4.17	1.34	3.36			8.86	8.14
47	4.30	0.92	3.72			8.94	8.06
48	4.31	0.97	3.65			8.94	8.06
49	4.72	0.78	3.57			9.06	7.94
50	4.88	0.83	3.37			9.08	7.92
51	3.14		5.77			8.92	8.08
52	3.01		5.84			8.85	8.15
53	3.24		5.78			9.03	7.97
54	3.25		5.73			8.98	8.02
55	3.30		5.67			8.98	8.02
56	5.65		2.37		1.02	9.04	7.96
57	5.64		2.33		1.04	9.01	7.99
58	5.69		2.30		1.01	9.00	8.00

Compositions are first expressed in weight %, then below, in terms of atoms per formula unit, for a total of 17 *apfu*. Numbers 1 to 55 are pentlandite, and 56 to 58 are argentopentlandite. Figure 1 gives the location of the drill holes sampled.

SUPPLEMENTARY TABLE 13. THE COMPOSITION OF PYRRHOTITE AND TROILITE IN OUR NORILSK SUITES

#	borehole, depth	Fe	Co	Ni	Cu	S	Total	Fe	Ni	Fe+Ni	S
1	PL-39-544.4	61.36				38.23	99.59	48.0	0.00	48.0	52.0
2	PL-39-544.4	61.61				37.95	99.56	48.2	0.00	48.2	51.8
3	PL-39-544.4	61.83			0.64	38.27	100.74	47.9	0.00	47.9	51.7
4	PL-40-554.5	60.07		0.40		39.46	99.93	46.5	0.29	46.8	53.2
5	PL-40-556.3	60.71				38.39	99.10	47.6	0.00	47.6	52.4
6	PL-40-556.3	61.43				38.57	100.00	47.8	0.00	47.8	52.2
7	PL-40-556.3	60.56				39.21	99.77	47.0	0.00	47.0	53.0
8	PL-40-567.5	60.66				39.29	99.95	47.0	0.00	47.0	53.0
9	PL-40-567.5	61.39				39.89	101.28	46.9	0.00	46.9	53.1
10	PL-40-567.5	61.68				39.64	101.32	47.2	0.00	47.2	52.8
11	PL-40-567.5	60.93				39.52	100.45	47.0	0.00	47.0	53.0
12	PL-40-567.5	61.08				39.17	100.25	47.2	0.00	47.2	52.8
13	PL-40-567.5	60.53				38.67	99.20	47.3	0.00	47.3	52.7
14	PL-40-567.5	60.08				38.88	98.96	47.0	0.00	47.0	53.0
15	PL-40-573.1	58.83				37.74	96.57	47.2	0.00	47.2	52.8
16	PL-40-573.1	57.38				37.71	95.09	46.6	0.00	46.6	53.4
17	PL-40-582.2	62.15				38.88	101.03	47.9	0.00	47.9	52.1
18	PL-40-582.2	61.04				38.75	99.79	47.5	0.00	47.5	52.5
19	PL-40-582.2	61.11				38.53	99.64	47.7	0.00	47.7	52.3
20	PL-40-582.2	61.15				38.27	99.42	47.8	0.00	47.8	52.2
21	PL-40-582.2	61.29				38.64	99.93	47.7	0.00	47.7	52.3
22	PL-40-582.2	61.64				39.09	100.73	47.5	0.00	47.5	52.5
23	PL-40-582.2	61.12				39.36	100.48	47.1	0.00	47.1	52.9
24	PL-40-582.2	62.14				39.07	101.21	47.7	0.00	47.7	52.3
25	PL-40-582.2	60.45		0.63		38.77	99.85	47.0	0.47	47.5	52.5
26	PL-40-582.2	61.22				39.11	100.33	47.3	0.00	47.3	52.7
27	PL-40-582.2	61.35				38.72	100.07	47.6	0.00	47.6	52.4
28	PL-40-549.8	62.15				38.85	101.00	47.9	0.00	47.9	52.1
29	PL-40-549.8	61.78				38.82	100.60	47.7	0.00	47.7	52.3
30	PL-40-549.8	60.69				37.80	98.49	48.0	0.00	48.0	52.0
31	PL-40-549.8	61.58				38.23	99.81	48.0	0.00	48.0	52.0
32	PL-41-214.5	63.87				36.65	100.52	50.0	0.00	50.0	50.0
33	PL-41-214.5	63.22				36.56	99.78	49.8	0.00	49.8	50.2
34	PL-41-214.5	63.92				37.07	100.99	49.7	0.00	49.7	50.3
35	PL-41-214.5	62.31				38.72	101.03	48.0	0.00	48.0	52.0
36	PL-41-214.5	62.45				38.64	101.09	48.1	0.00	48.1	51.9
37	PL-41-214.5	61.12				38.53	99.65	47.7	0.00	47.7	52.3
38	PL-41-306	63.87			0.52	36.65	101.04	49.8	0.00	49.8	49.8
39	PL-41-306	63.69				36.45	100.14	50.1	0.00	50.1	49.9

40	PL-41-306	60.86			0.54	38.09	99.49	47.7	0.00	47.7	52.0
41	PL-41-306	63.72				36.68	100.40	49.9	0.00	49.9	50.1
42	PL-41-322.3	64.28			0.36	36.67	101.31	50.0	0.00	50.0	49.7
43	PL-41-329.2	62.41				37.56	99.97	48.8	0.00	48.8	51.2
44	PL-41-329.2	63.14				36.22	99.36	50.0	0.00	50.0	50.0
45	PL-41-329.2	64.26				36.60	100.86	50.2	0.00	50.2	49.8
46	PL-41-329.2	64.19				36.49	100.68	50.2	0.00	50.2	49.8
47	PL-42-331.5	62.58				35.81	98.39	50.1	0.00	50.1	49.9
48	PL-42-331.5	56.98		5.75	0.82	34.39	97.94	46.3	4.44	50.7	48.7
49	PL-42-331.5	56.20		5.92	1.36	34.83	98.31	45.4	4.55	50.0	49.0
50	PL-39-351.4	61.89				35.34	97.23	50.1	0.00	50.1	49.9
51	PL-39-351.4	62.97				36.09	99.06	50.0	0.00	50.0	50.0
52	PL-39-351.4	56.64	0.70	4.59	0.73	35.43	98.09	45.7	3.52	49.2	49.8
53	PL-51-185.8	63.95	0.43			36.51	100.89	50.0	0.00	50.0	49.7
54	WF-138-292.5	60.41		0.61	0.56	39.95	101.53	46.1	0.44	46.5	53.1
55	WF-138-292.5	59.86		1.76		40.27	101.89	45.5	1.27	46.7	53.3
56	WF-138-292.5	57.60		0.98	0.70	40.73	100.01	44.3	0.72	45.0	54.5
57	WF-211-1365.7	64.78				37.09	101.87	50.1	0.00	50.1	49.9
58	WF-211-1365.7	62.61			0.95	36.34	99.90	49.4	0.00	49.4	49.9
59	WF-211-1411.7	63.70				36.41	100.11	50.1	0.00	50.1	49.9
60	WF-211-1411.7	63.85				36.60	100.45	50.0	0.00	50.0	50.0
61	WF-211-1416.9	63.57				36.66	100.23	49.9	0.00	49.9	50.1
62	WF-211-1416.9	64.26				36.30	100.56	50.4	0.00	50.4	49.6
63	WF-211-1416.9	64.35				36.07	100.42	50.6	0.00	50.6	49.4
64	WF-211-1416.9	63.98				36.84	100.82	49.9	0.00	49.9	50.1

Compositions are first expressed in weight %, then on the right, in terms of atom % based on a total of 100%. Figure 1 gives the location of the drill holes sampled.

SUPPLEMENTARY TABLE 14. THE COMPOSITION OF CUBANITE, DIGENITE AND PYRITE IN OUR NORILSK SUITES

#	borehole, depth	Fe	Cu	Co	Ni	S	Total	Fe	Cu	Co	Ni	ΣM	S
						Cubanite							
1	PL-40-556.3	41.78	23.32			34.84	99.94	2.04	1.00	0.00	0.00	3.04	2.96
2	PL-41-306	40.50	24.45			35.09	100.04	1.97	1.05	0.00	0.00	3.02	2.98
3	PL-41-322.3	41.04	23.92			35.60	100.56	1.98	1.02	0.00	0.00	3.00	3.00
4	PL-41-322.3	40.67	24.71			35.82	101.20	1.96	1.04	0.00	0.00	3.00	3.00
5	PL-41-322.3	40.32	25.09			35.48	100.89	1.95	1.07	0.00	0.00	3.01	2.99
6	WF-211-1365.7	41.30	23.56			35.40	100.26	2.00	1.00	0.00	0.00	3.01	2.99
						Digenite							
7	PL-41-322.3		76.78			21.09	97.87	0.00	9.06	0.00	0.00	9.06	4.94
8	PL-41-322.3		77.00			21.76	98.76	0.00	8.97	0.00	0.00	8.97	5.03
9	PL-41-322.3		74.08			20.75	94.83	0.00	9.00	0.00	0.00	9.00	5.00
10	PL-41-322.3		74.96			20.76	95.72	0.00	9.04	0.00	0.00	9.04	4.96
						Pyrite							
11	PL-40-582.2	44.36		2.98		53.56	100.90	0.95	0.00	0.06	0.00	1.01	1.99
12	PL-40-582.2	44.44		3.30		53.33	101.07	0.95	0.00	0.07	0.00	1.02	1.98
13	PL-40-582.2	44.37		2.77		53.39	100.53	0.95	0.00	0.06	0.00	1.01	1.99
14	PL-41-372.4	45.82				52.34	98.16	1.00	0.00	0.00	0.00	1.00	2.00
15	PL-41-372.4	45.25		1.92		53.27	100.44	0.97	0.00	0.04	0.00	1.01	1.99
16	PL-41-372.4	45.81			0.42	51.59	97.82	1.01	0.00	0.00	0.01	1.02	1.98
17	PL-41-372.4	45.12			1.05	52.10	98.27	0.99	0.00	0.00	0.02	1.01	1.99
18	PL-41-372.4	44.92				51.69	96.61	1.00	0.00	0.00	0.00	1.00	2.00

19	PL-41-372.4	46.12		51.40	97.52	1.02	0.00	0.00	0.00	1.02	1.98
20	PL-41-372.4	45.87	0.83	52.65	99.35	0.99	0.00	0.00	0.02	1.01	1.99
21	PL-41-372.4	45.56	0.84	52.59	98.99	0.99	0.00	0.00	0.02	1.01	1.99
22	PL-41-372.4	45.39		51.79	97.18	1.00	0.00	0.00	0.00	1.00	2.00
23	PL-41-372.4	45.16	1.51	53.05	99.72	0.97	0.00	0.00	0.03	1.01	1.99
24	PL-41-388.2	47.76		52.87	100.63	1.02	0.00	0.00	0.00	1.02	1.98
25	PL-41-388.2	47.25		53.86	101.11	1.00	0.00	0.00	0.00	1.00	2.00
26	PL-41-388.2	46.59	1.08	53.40	101.07	0.99	0.00	0.00	0.02	1.02	1.98
27	PL-41-388.2	45.09	0.90	52.50	98.49	0.98	0.00	0.00	0.02	1.00	2.00
28	PL-41-388.2	45.18	0.23	51.76	97.17	1.00	0.00	0.00	0.00	1.00	2.00
29	WF-138-292.5	42.26	5.49	53.85	101.60	0.90	0.00	0.00	0.11	1.01	1.99
30	WF-138-292.5	41.42	5.25	53.77	100.44	0.89	0.00	0.00	0.11	0.99	2.01

Compositions are first expressed in weight % and then, on the right, in terms of atoms per formula unit. The atomic proportions are based on a total of six *apfu* for cubanite. 14 *apfu* for digenite and three *apfu* for pyrite. Figure 1 gives the location of the drill holes sampled.

SUPPLEMENTARY TABLE 15. THE COMPOSITION OF ZIRCONOTITANATE MINERALS OF ZIRCONOLITE TYPE IN OUR NORILSK SUITES

#	borehole, depth	Nb_2O_5	TiO_2	ZrO_2	ThO_2	UO_2	Y_2O_3	Sm_2O_3	Nd_2O_3	Ce_2O_3	Gd_2O_3	Dy_2O_3	Er_2O_3	Yb_2O_3	FeO	CaO	Total
1	PL-39-538.7		30.24	35.61	2.91	1.54	8.23	0.68	2.37	1.75	0.81	0.93	0.80		8.99	4.67	100.04
2	PL-39-538.7		30.26	36.20	2.64	1.13	8.89	1.14	2.46	1.65	0.75		0.97		8.85	4.81	100.31
3	PL-39-538.7		29.99	33.00	3.56	1.89	9.14	1.17	2.29	1.38	1.08	0.98	1.37		8.75	5.02	99.62
4	PL-39-538.7		32.26	37.47	2.11	0.84	5.02	0.92	2.25	2.23	0.46	0.61	0.41	0.85	8.05	6.81	100.29
5	PL-39-538.7		30.64	35.82	1.81	0.86	7.61	1.24	1.98	1.92	0.54	1.47	0.81		8.41	5.83	98.94
6	PL-41-306		35.38	38.47			7.35	0.59	1.90	0.86	0.53				7.54	8.55	101.17
7	PL-41-322.3	2.53	29.77	34.62	1.79		11.52	0.77	1.43	1.03	0.21	1.35		1.48	8.27	4.67	99.44
8	PL-41-322.3	1.85	32.18	36.27	1.19		8.81	0.77	2.06	1.49	0.56	0.78			7.95	6.35	100.26
9	PL-41-329.2	5.34	24.87	30.41	11.58	6.28	4.03		1.52	1.26					6.10	6.02	97.41
10	PL-41-372.4	4.82	31.38	31.72	7.66	3.99	1.57		1.39						7.58	9.02	99.13
11	PL-41-372.4	4.68	30.79	31.87	7.97	4.19	2.40		1.19						8.07	8.81	99.97
12	PL-41-372.4	6.14	36.63	35.99	1.67				1.46	1.70					6.45	12.13	102.17
13	PL-41-372.4	4.82	30.54	32.51	6.99	4.10	1.87		1.62						7.55	8.77	98.77
14	PL-51-185.8		29.22	33.57	2.06		12.84	0.88	2.37	1.25	1.41	1.47	1.76		9.28	3.67	100.11
15	PL-51-185.8		29.56	33.54	2.06		12.33	0.73	2.18	1.57	1.19	1.46	1.81		9.84	3.53	99.80
16	WF-211-1365.7	2.56	32.19	34.01	3.25				3.52	3.85					8.32	7.07	94.77

#	Nb	Ti	Zr	Th	U	Y	Sm	Nd	Ce	Gd	Dy	Er	Yb	Fe^{2+}	Ca
1	0.00	3.00	2.29	0.09	0.05	0.58	0.03	0.11	0.08	0.07	0.04	0.03	0.00	0.99	0.66
2	0.00	2.98	2.31	0.08	0.03	0.62	0.05	0.11	0.08	0.06	0.00	0.04	0.00	0.97	0.67
3	0.00	3.02	2.16	0.11	0.06	0.65	0.05	0.11	0.07	0.09	0.04	0.06	0.00	0.98	0.72
4	0.00	3.13	2.35	0.06	0.02	0.34	0.04	0.10	0.11	0.04	0.03	0.02	0.03	0.87	0.94
5	0.00	3.05	2.31	0.05	0.03	0.54	0.06	0.09	0.09	0.05	0.06	0.03	0.00	0.93	0.83

6	0.00	3.26	2.30	0.00	0.00	0.48	0.02	0.08	0.04	0.04	0.00	0.00	0.00	0.77	1.12
7	0.15	2.94	2.22	0.05	0.00	0.81	0.03	0.07	0.05	0.02	0.06	0.00	0.06	0.91	0.66
8	0.11	3.08	2.25	0.03	0.00	0.60	0.03	0.09	0.07	0.05	0.03	0.00	0.00	0.85	0.86
9	0.35	2.69	2.13	0.38	0.20	0.31	0.00	0.08	0.07	0.00	0.00	0.00	0.00	0.73	0.93
10	0.29	3.09	2.03	0.23	0.12	0.11	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.83	1.27
11	0.28	3.03	2.03	0.24	0.12	0.17	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.88	1.24
12	0.33	3.27	2.08	0.05	0.00	0.00	0.00	0.06	0.07	0.00	0.00	0.00	0.00	0.64	1.54
13	0.29	3.03	2.09	0.21	0.12	0.13	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.83	1.24
14	0.00	2.92	2.17	0.06	0.00	0.91	0.04	0.11	0.06	0.12	0.06	0.07	0.00	1.03	0.52
15	0.00	2.96	2.18	0.06	0.00	0.87	0.03	0.10	0.08	0.10	0.06	0.08	0.00	1.10	0.50
16	0.16	3.24	2.22	0.10	0.00	0.00	0.00	0.17	0.19	0.00	0.00	0.00	0.00	0.93	1.01

Compositions are expressed in wt.% oxides, then below in terms of atoms per formula unit, calculated on the basis of 14 oxygen atoms. The composition of these zirconolite-type minerals corresponds to unnamed members (Y- or Ca-dominant) of the zirconolite group: $(Y,Ca,REE)_2Zr_2(Ti,Nb)_2TiFe^{2+}O_{14}$ or $(Ca,Y,REE)_2Zr_2(Ti,Nb)_2TiFe^{2+}O_{14}$. Totals in composition numbers 1, 2 and 14 include the following amounts of MgO: 0.51% (0.27 apfu), 0.56% (0.30 apfu), and 0.33 wt.% (0.18 apfu), respectively. Figure 1 gives the location of the drill holes sampled.

SUPPLEMENTARY TABLE 16. COMPOSITION OF MEMBERS OF THE SOBOLEVSKITE–KOTULSKITE SERIES AND SUDBURYITE IN THE NORILSK SUITES

#	Section	Pt	Pd	Fe	Ni	Cu	Ag	S	As	Te	Bi	Sb	Total
1	PL-40-556.3		35.74							20.46	38.90		95.10
2	PL-40-556.3		33.18	7.59	1.43	0.73		4.08		20.82	32.90		100.73
3	PL-40-556.3		39.95							23.32	40.24		103.51
4	PL-40-556.3		38.07							21.33	39.82		99.22
5	PL-40-556.3		37.86							22.15	40.61		100.62
6	PL-40-556.3		38.58							24.51	35.89		98.98
7	PL-40-567.5		41.11							35.24	23.78	3.09	103.22
8	PL-40-567.5		41.14							30.27	27.89	3.17	102.47
9	PL-40-567.5		39.72							29.59	28.34	2.82	100.47
10	PL-40-549.8		38.22	2.95						27.89	34.63		103.69
11	PL-40-549.8		36.91	1.1						26.77	30.41		95.19
12	PL-40-549.8		38.82							25.37	35.61		99.80
13	PL-40-549.8		40.14						1.03	27.35	34.09		102.61
14	PL-40-549.8		35.08	1.29		1.12				17.56	40.17		95.22
15	PL-41-214.5		38.06							13.55	47.03	2.12	100.76
16	PL-41-214.5		36.74							7.00	48.87	4.88	97.49
17	PL-41-214.5		37.69							9.08	49.95	3.94	100.66
18	PL-41-322.3	3.32	33.66	1.80	1.00	3.33		0.64	3.58	26.93	26.30		100.56
19	PL-41-322.3		39.47							29.41	31.12		100.00
20	PL-41-329.2		38.93	1.15						22.02	38.90		101.00
21	PL-41-329.2		37.59	1.1			2.17			22.45	38.29		101.60
22	PL-43-349.4		41.33							33.99	27.34		102.66
23	PL-39-351.4		37.40				1.84			17.02	41.79	1.34	99.39
24	PL-40-554.5		36.47							7.14	33.00	24.54	101.15

25	PL-40-554.5		45.13	1.86						5.22	47.87		100.08
26	PL-40-554.5		42.90	1.36	0.53			0.77		7.56	45.90		99.02
27	PL-40-554.5		43.96	0.77	0.50					4.95	49.28		99.46
28	PL-40-554.5		44.08	0.91	0.49					3.32	49.80		98.60
29	PL-40-554.5		36.95						5.97	31.27	26.43		100.62
30	PL-40-554.5		36.58	0.41					5.59	31.36	25.31		99.25

#	Name	Pt	Pd	Fe	Ni	Cu	Σ	Ag	S	As	Te	Bi	Sb	Σ
1	Sov		0.98				0.98				0.47	0.55		1.02
2	Ktu		0.67	0.29	0.05	0.02	1.04		0.27		0.35	0.34		0.96
3	Sov		1.00				1.00				0.49	0.51		1.00
4	Sov		1.00				1.00				0.47	0.53		1.00
5	Sov		0.98				0.98				0.48	0.54		1.02
6	Ktu		1.00				1.00				0.53	0.47		1.00
7	Ktu		0.96				0.96				0.69	0.28	0.06	1.04
8	Ktu		0.99				0.99				0.61	0.34	0.07	1.01
9	Ktu		0.98				0.98				0.61	0.36	0.06	1.02
10	Ktu		0.90	0.13			1.03				0.55	0.42		0.97
11	Ktu		0.96	0.05			1.02				0.58	0.40		0.98
12	Ktu		0.99				0.99				0.54	0.46		1.01
13	Ktu		0.98				0.98			0.04	0.56	0.42		1.02
14	Sov		0.94	0.07			1.06				0.39	0.55		0.94
15	Sov		1.01				1.01				0.30	0.64	0.05	0.99
16	Sov		1.02				1.02				0.16	0.69	0.12	0.98
17	Sov		1.02				1.02				0.20	0.69	0.09	0.98
18	Ktu	0.04	0.75	0.08	0.04	0.12	1.04		0.05	0.11	0.50	0.30		0.96
19	Ktu		0.99				0.99				0.61	0.40		1.01
20	Sov		0.98	0.06			1.04				0.46	0.50		0.96
21	Sov		0.94	0.05			1.05	0.05			0.47	0.49		0.95

22	Ktu	0.99			0.99			0.68	0.33		1.01
23	Sov	0.99			1.03	0.05		0.37	0.56	0.03	0.97
24	Sdb	0.90			0.90			0.15	0.42	0.53	1.10
25	Sdb	0.97	0.08		1.04				0.06	0.90	0.96
26	Sdb	0.92	0.06	0.02	1.00		0.05		0.08	0.86	1.00
27	Sdb	0.96	0.03	0.02	1.01				0.05	0.94	0.99
28	Sdb	0.96	0.04	0.02	1.02				0.04	0.95	0.98
29	Sdb	0.91			0.91			0.12	0.39	0.57	1.09
30	Sdb	0.91	0.02		0.93			0.12	0.40	0.55	1.07

Compositions are first reported in wt.%, then in atoms per formula unit, calculated on the basis of 2 *apfu*. Symbols used: Sov: sobolevskite; Ktu: kotulskite; Sdb: sudburyite. Figure 1 gives the location of the drill holes sampled.

SUPPLEMENTARY TABLE 17. COMPOSITION OF MERTIEITE-II
IN THE NORILSK SUITES

#	Section	Pd	Fe	Ni	Ag	S	As	Sn	Sb	Total
1	PL-39-544.4	66.24			2.57		9.53		20.29	98.63
2	PL-40-556.3	65.97	0.80	3.72			8.11	5.34	19.86	103.80
3	PL-40-573.1	69.98	1.34	0.79	2.81	0.60	9.74		15.13	100.39
4	PL-40-582.2	64.00							31.10	95.10
5	PL-40-582.2	63.11							36.89	100.00
6	PL-40-582.2	64.93							37.83	102.76
7	PL-40-582.2	63.55							36.45	100.00
8	PL-40-582.2	65.02							37.11	102.13
9	PL-40-582.2	63.50							36.50	100.00
10	PL-40-582.2	63.27							36.73	100.00
11	PL-40-582.2	68.52							31.48	100.00
12	PL-40-582.2	64.63	1.53						33.84	100.00
13	PL-40-582.2	71.55					1.96		28.37	101.88
14	PL-40-582.2	70.95					0.68		29.90	101.53
15	PL-41-214.5	72.37					3.51		26.32	102.20
16	PL-41-214.5	71.68					4.08		25.47	101.23
17	WF-209-576.4	68.08				1.92	1.47		29.95	101.42
18	WF-209-576.4	69.95				0.30	1.21		28.96	100.42
19	WF-209-576.4	70.34				0.70	1.84		28.16	101.04
20	WF-209-576.4	69.83					1.11		29.22	100.16
21	WF-209-576.4	69.89	1.13				1.26		29.41	101.69
22	WF-209-576.4	71.03					1.64		28.61	101.28

#	Pd	Fe	Ni	Ag	S	Σ	As	Sn	Sb	Σ
1	7.28			0.28		7.56	1.49		1.95	3.44
2	6.73	0.16	0.69			7.57	1.17	0.49	1.77	3.43
3	7.28	0.27	0.15	0.29	0.21	7.98	1.44		1.38	3.02
4	7.72					7.72			3.28	3.28
5	7.28					7.28			3.72	3.72
6	7.29					7.29			3.71	3.71
7	7.33					7.33			3.67	3.67
8	7.34					7.34			3.66	3.66
9	7.32					7.32			3.68	3.68
10	7.30					7.30			3.70	3.70
11	7.85					7.85			3.15	3.15
12	7.32	0.33				7.65			3.35	3.35
13	7.94					7.94	0.31		2.75	3.06
14	7.96					7.96	0.11		2.93	3.04
15	7.93					7.93	0.55		2.52	3.07
16	7.91					7.91	0.64		2.46	3.09
17	7.29				0.68	7.29	0.22		2.80	3.71
18	7.85				0.11	7.85	0.19		2.84	3.15
19	7.75				0.26	7.75	0.29		2.71	3.25
20	7.92					7.92	0.18		2.90	3.08
21	7.72	0.24				7.96	0.20		2.84	3.04
22	7.94					7.94	0.26		2.80	3.06

Compositions are first reported in wt.%, then in atoms per formula unit, calculated on the basis of 11 *apfu*. Figure 1 gives the location of the drill holes sampled.

SUPPLEMENTARY TABLE 18. COMPOSITION OF MICHENERITE AND MERENSKYITE IN THE NORILSK SUITES

#	Section	Pd	Fe	Te	Bi	Sb	Total
1	PL-40-554.5	25.19	0.67	29.59	41.32	3.84	100.61
2	PL-40-554.5	24.91	0.75	29.40	41.96	3.45	100.47
3	PL-40-554.5	24.23		29.06	44.08	2.91	100.28
4	PL-40-554.5	23.85		28.71	43.98	3.18	99.72
5	PL-40-554.5	25.26		30.30	42.70	3.76	102.02
6	PL-40-554.5	23.67	1.23	28.40	42.03	4.72	100.05
7	PL-40-567.5	25.91		45.81	25.06		96.78
8	PL-40-567.5	25.44		32.57	43.46		101.47

#	Name	Pd	Fe	Te	Bi	Sb	ΣMe	Bi+Sb	Te+Bi+Sb
1	Mch	1.00	0.05	0.98	0.84	0.13	1.05	0.97	1.95
2	Mch	0.99	0.06	0.98	0.85	0.12	1.05	0.97	1.95
3	Mch	0.99		0.99	0.92	0.10	0.99	1.02	2.01
4	Mch	0.98		0.98	0.92	0.11	0.98	1.04	2.02
5	Mch	1.00		1.00	0.86	0.13	1.00	0.99	2.00
6	Mch	0.94	0.09	0.94	0.85	0.16	1.04	1.02	1.96
7	Mrk	1.01		1.49	0.50		1.01	0.50	1.99
8	Mch	1.02		1.09	0.89		1.02	0.89	1.98

Compositions are first reported in wt.%, then in atoms per formula unit, calculated on the basis of 3 *apfu*. Symbols used: Mch: michenerite, Mrk: merenskyite. Figure 1 gives the location of the drill holes sampled.

SUPPLEMENTARY TABLE 19. COMPOSITIONS OF SPERRYLITE, HOLLINGWORTHITE AND IRARSITE IN THE NORILSK SUITES

#	Section	Pt	Pd	Rh	Os	Ir	Fe	Co	Ni	Cu	S	As	Sb	Te	Total
1	PL-39-544.4	56.16					0.81			0.95		43.65			101.57
2	PL-39-544.4	55.85					2.24					43.09			101.18
3	PL-39-544.4	55.19					1.70					42.83			99.72
4	PL-40-554.5	57.15		0.42			1.05					42.71			101.33
5	PL-40-554.5	54.91		0.22			1.19					41.42	0.24		97.98
6	PL-40-554.5	55.11		0.02			1.76			0.77	0.75	42.37			100.78
7	PL-40-554.5	55.03		0.69								42.43			98.15
8	PL-40-556.3	53.59							1.65			41.17			96.41
9	PL-40-556.3	58.12										43.40			101.52
10	PL-40-573.1	57.65										43.44			101.09
11	PL-40-573.1	55.61					2.10					43.71	0.39		101.81
12	PL-40-582.2	59.35										41.84			101.19
13	PL-40-582.2	58.67										41.21			99.88
14	PL-40-582.2	56.79										40.05			96.84
15	PL-40-549.8	57.74										43.25	0.73		101.72
16	PL-40-549.8	58.53										43.64			102.17
17	PL-41-214.5	56.57									1.05	42.46			100.08
18	PL-41-214.5	56.14					1.44			1.39		44.01			102.98
19	PL-41-214.5	55.48		2.46								41.64			99.58
20	PL-41-322.3	53.22					1.60			2.55		41.22	0.67		99.26
21	PL-41-322.3	57.86										37.86	0.91		96.63
22	PL-41-322.3	57.80										42.26			100.06
23	PL-41-322.3	57.88										42.25	0.59		100.72
24	PL-41-329.2	57.01									0.56	42.43			100.00
25	PL-41-329.2	51.87					1.75			0.96		40.34			94.92

26	PL-43-349.4	55.36									41.69				97.05
27	PL-39-351.4	54.81									41.10				95.91
28	PL-54-299.1	57.47									40.54				98.01
29	WF-209-576.4	57.34					1.41				1.27	41.89			101.91
30	WF-209-576.4	58.17					1.45				1.13	41.12			101.87
31	PL-39-544.4	6.89	1.76	12.42	3.41	26.37	5.86	0.56	0.35		17.88	25.51			101.01
32	PL-40-567.5			36.75			3.95	2.23	2.26		16.57	37.51			99.27
33	PL-40-567.5			37.82			3.92	1.74	2.01		16.91	37.31			99.71
34	PL-40-573.1		4.41	31.30			3.03	1.58	1.59	1.70	15.83	35.58		1.15	96.17

#	Symbol	Pt	Pd	Rh	Os	Ir	Fe	Co	Ni	Cu	Σ	S	As	Sb	Te	Σ
1	Spy	0.96					0.05			0.05	1.06		1.94			1.94
2	Spy	0.95					0.13				1.09		1.91			1.91
3	Spy	0.96					0.10				1.06		1.94			1.94
4	Spy	0.99		0.01			0.06				1.07		1.93			1.93
5	Spy	0.98		0.01			0.07				1.06		1.93	0.01		1.94
6	Spy	0.93					0.10			0.04	1.07	0.08	1.85			1.93
7	Spy	0.99		0.02						0.00	1.01		1.99			1.99
8	Spy	0.97							0.10		1.07		1.93			1.93
9	Spy	1.02									1.02		1.98			1.98
10	Spy	1.01									1.01		1.99			1.99
11	Spy	0.94					0.12				1.06		1.92	0.01		1.94
12	Spy	1.06									1.06		1.94			1.94
13	Spy	1.06									1.06		1.94			1.94
14	Spy	1.06									1.06		1.94			1.94
15	Spy	1.01									1.01		1.97	0.02		1.99
16	Spy	1.02									1.02		1.98			1.98
17	Spy	0.98									0.98	0.11	1.91			2.02
18	Spy	0.94					0.08			0.07	1.09		1.91			1.91

19	Spy	0.99		0.08					0.00	1.07			1.93			1.93
20	Spy	0.91					0.10		0.13	1.14			1.84	0.02		1.86
21	Spy	1.10								1.10			1.87	0.03		1.90
22	Spy	1.03								1.03			1.97			1.97
23	Spy	1.03								1.03			1.95	0.02		1.97
24	Spy	1.00								1.00		0.06	1.94			2.00
25	Spy	0.94					0.11		0.05	1.10			1.90			1.90
26	Spy	1.01								1.01			1.99			1.99
27	Spy	1.02								1.02			1.98			1.98
28	Spy	1.06								1.06			1.94			1.94
29	Spy	0.96					0.08			1.04		0.13	1.83			1.96
30	Spy	0.98					0.09			1.07		0.12	1.81			1.93
31	Irs	0.08	0.04	0.27	0.04	0.31	0.23	0.02	0.01	1.00		1.24	0.76			2.00
32	Hlw			0.70			0.14	0.07	0.08	0.99		1.02	0.99			2.01
33	Hlw			0.72			0.14	0.06	0.07	0.99		1.04	0.98			2.01
34	Hlw		0.09	0.63			0.11	0.06	0.06	0.06	0.99		1.02	0.98		0.02	2.01

Compositions are first reported in wt.%, then in atoms per formula unit, calculated on the basis of 3 apfu. Symbols used: Hlw: hollingworthite, Irs: irarsite, Spy: sperrylite. Figure 1 gives the location of the drill holes sampled.

SUPPLEMENTARY TABLE 20. COMPOSITIONS OF ISOMERTIEITE, MAJAKITE, MENSHIKOVITE, NORILSKITE AND TULAMEENITE IN THE NORILSK SUITES

#	Symbol	Section	Pt	Pd	Fe	Ni	Cu	Ag	S	As	Sb	Pb	Total
1	Ism	PL-40-573.1		69.98	1.34	0.79		2.81	0.60	9.74	15.13		100.39
2	Mjk	PL-40-556.3		45.90		23.12				33.42			102.44
3	Mjk	PL-40-556.3	2.48	40.84	2.57	22.79				31.79			100.47
4	Mjk	PL-40-556.3		44.44		23.47				33.27			101.18
5	Mjk	PL-40-549.8		45.36	1.15	22.59				30.67			99.77
6	Mjk	PL-41-214.5		45.30		22.79				31.91			100.00
7	Mjk	PL-42-331.5		44.89	1.39	23.25				28.98			98.51
8	Mjk	PL-39-351.4		44.33	1.56	23.80				30.84			100.53
9	Mjk	PL-39-351.4		44.73	1.53	22.67				30.18			99.11
10	Mnv	PL-40-573.1		49.19	1.64	15.94				31.17	1.03		98.97
11	Mnv	PL-40-573.1		46.87	1.92	17.72				34.21			100.72
12	Mnv	PL-40-549.8		49.94		16.78				33.66			100.38
13	Mnv	PL-41-214.5		47.95		16.89				35.16			100.00
14	Nrs	PL-41-306		54.98								45.23	100.21
15	Nrs	PL-41-306		53.40				2.72				40.37	96.49
16	Nrs	PL-41-306		61.73								40.75	102.48
17	Nrs	PL-41-306		59.89								40.22	100.11
18	Nrs	PL-41-306		45.23				3.82				53.22	102.27
19	Nrs	PL-41-306		44.67				4.83				52.79	102.29
20	Tul	PL-41-322.3	65.59		18.86	1.37	12.11						97.93
21	Tul	PL-41-322.3	65.72		16.54	1.34	14.67						98.27
22	Tul	PL-41-322.3	55.93	7.94	13.25	1.16	17.96						96.24
23	Tul	PL-41-322.3	55.86	13.94	14.25	1.89	10.34						96.28

#	Pt	Pd	Fe	Ni	Cu	Ag	Σ	S	As	Sb	As+Sb	Pb
1		9.92	0.36	0.20		0.39	10.88	0.28	1.96	1.88	4.12	
2		1.02		0.93			-		1.05	0.06	-	
3	0.03	0.92	0.11	0.93			-		1.01		-	
4		0.99		0.95			-		1.06		-	
5		1.03	0.05	0.93			-		0.99		-	
6		1.03		0.94			-		1.03		-	
7		1.03	0.06	0.97			-		0.94		-	
8		0.99	0.07	0.96			-		0.98		-	
9		1.02	0.07	0.94			-		0.98		-	
10		3.11	0.20	1.83			-		2.80		-	
11		2.86	0.22	1.96			-		2.96		-	
12		3.12		1.90			-		2.98		-	
13		2.98		1.91			-		3.11		-	
14		7.73					7.73					3.27
15		7.65				0.38	8.03					2.97
16		8.21					8.21					2.79
17		8.18					8.18					2.82
18		6.52				0.54	7.06					3.94
19		6.42				0.68	7.10					3.90
20	1.51		1.52	0.11	0.86							
21	1.52		1.34	0.10	1.04							
22	1.27	0.33	1.05	0.09	1.25							
23	1.32	0.60	1.18	0.15	0.75							

Compositions are first reported in wt.%, then in atoms per formula unit. Number 1, Ism, is isomertieite (atomic proportions are based on a total of 15 *apfu*); #2 – 9, Mjk, are majakite (3 *apfu*); #10 – 13, Mnv, are menshikovite (8 *apfu*); #14 – 19, Nrs, are norilskite (11 *apfu*); and 20 – 23, Tul, are tulameenite (4 *apfu*). The Pd-enriched compositions (# 22, 23) pertain to the alloy present in the rim of a zoned grain. Figure 1 gives the location of the drill holes sampled.