

## Drilling delivers high grade Heavy Rare Earths at Gambit West and extension of Wolverine to 300m depth

### Highlights

- Outstanding Heavy Rare Earth (HRE) assay results from drilling at Gambit West prospect – including highest grades received to date from Browns Range project.
- Drilling at Gambit West confirms high grade mineralisation near surface and at depth, including.

Interval (m)	TREO <sup>1</sup> (%)	Dy <sub>2</sub> O <sub>3</sub> Ppm	Y <sub>2</sub> O <sub>3</sub> ppm
40	2.26	1,978	13,509
34	1.39	1,216	7,967
10	7.83	7,333	50,186
inc. 2	31.64	29,714	203,745
7	6.08	5,619	38,318
inc.3	13.67	12,791	87,153

- Visual and portable XRF measurements<sup>2</sup> from Wolverine diamond drilling indicate further extensions of typical Wolverine style, breccia hosted mineralisation at depths below 150m, and down to 300m.
- Resource update planned for October, incorporating Wolverine depth extensions and initial resources from Gambit West, Gambit Central and Area 5.



**2013 Drilling at Wolverine**

<sup>1</sup> TREO: total rare earth oxides - Total of La<sub>2</sub>O<sub>3</sub>, CeO<sub>2</sub>, Pr<sub>6</sub>O<sub>11</sub>, Nd<sub>2</sub>O<sub>3</sub>, Sm<sub>2</sub>O<sub>3</sub>, Eu<sub>2</sub>O<sub>3</sub>, Gd<sub>2</sub>O<sub>3</sub>, Tb<sub>4</sub>O<sub>7</sub>, Dy<sub>2</sub>O<sub>3</sub>, Ho<sub>2</sub>O<sub>3</sub>, Er<sub>2</sub>O<sub>3</sub>, Tm<sub>2</sub>O<sub>3</sub>, Yb<sub>2</sub>O<sub>3</sub>, Lu<sub>2</sub>O<sub>3</sub>, Y<sub>2</sub>O<sub>3</sub>.

<sup>2</sup> A Niton XL3t 950 Gold D+ Mining Analyser portable XRF unit was used for yttrium measurements. Previous analysis of XRF results and laboratory assay results for yttrium on Browns Range drill samples has shown reliable correlation between the two sets of results.



Northern Minerals (ASX:NTU) is pleased to announce initial results from ongoing drilling at the Gambit West and Wolverine prospects at its Browns Range project, including the highest grade HRE intersections received to date.

The results are the first from a 20,000 metre drilling program, which is targeting an increase in resources at Browns Range. Data from the drilling results will be incorporated into a resource update, which is planned to be released in October.

Best intersections from the first phase of Reverse Circulation (RC) drilling at Gambit West include:

Hole Number	From(m)	To(m)	Interval (m)	TREO (%)	Dy <sub>2</sub> O <sub>3</sub> (ppm)	Y <sub>2</sub> O <sub>3</sub> (ppm)
BRGR0084	26	42	16	0.50	383	2,586
	& 65	73	8	1.17	1076	7,475
BRGR0086	24	32	8	1.93	1821	12,212
	& 39	53	14	0.71	570	3,853
BRGR0088	26	33	7	0.89	789	5,079
BRGR0093	20	60	40	2.26	1978	13,509
	Inc. 42	51	9	4.65	4227	28,964
BRGR0094	59	70	11	1.42	1207	7,927
	Inc. 60	64	4	3.38	3009	19,694
	& 105	112	7	0.96	820	5,705
BRGR0095	54	58	4	1.79	1558	10,488
BRGR0096	84	98	14	1.11	989	6,561
BRGR0098	139	149	10	7.83	7333	50,186
	Inc. 142	144	2	31.64	29714	203,745
BRGR0100	18	25	7	1.17	979	6,583
BRGR0101	58	71	13	0.83	665	4,482
BRGR0102	2	36	34	1.39	1216	7,967
	Inc. 4	8	4	6.09	5762	37,956
BRGR0103	105	109	4	1.65	1518	10,478
BRGR0106	78	87	9	1.44	1214	8,151
BRGR0113	57	63	6	1.77	1595	10,720
BRGR0114	108	111	3	3.01	2733	18,314
BRGR0115	64	71	7	6.08	5619	38,318
	Inc. 65	68	3	13.67	12791	87,153
BRGR0116	9	17	8	1.06	966	6,339
BRGR0121	158	162	4	4.3	3845	24,629

(mineralised intervals are downhole widths >2m @ 0.15% TREO, not true widths. Intersections calculated using a 0.15% TREO cut-off and a maximum of 2m internal dilution. No top cut has been applied. Samples were submitted to Genalysis Laboratory for REE analysis using a FP6/OM Sodium Peroxide Fusion Digest)

The program at Gambit West involved 42 holes for 4,338m of drilling. The program follows highly encouraging results from the first drilling at the prospect in 2012. The drilling has outlined mineralisation over a strike length of approximately 200m and has intersected mineralisation at a vertical depth of 150m. The results have defined a particularly high grade zone of mineralisation at the centre of the mineralised trend, which occurs from within two meters of surface. The Gambit West mineralisation displays a similar REO distribution to the Wolverine deposit, with approximately 90% of REO being HREO (above a cut-off of 0.15% TREO for all 2013 drill assay results from Gambit West).

**HREO = Heavy Rare Earth Oxides** – Total of Sm<sub>2</sub>O<sub>3</sub>, Eu<sub>2</sub>O<sub>3</sub>, Gd<sub>2</sub>O<sub>3</sub>, Tb<sub>4</sub>O<sub>7</sub>, Dy<sub>2</sub>O<sub>3</sub>, Ho<sub>2</sub>O<sub>3</sub>, Er<sub>2</sub>O<sub>3</sub>, Tm<sub>2</sub>O<sub>3</sub>, Yb<sub>2</sub>O<sub>3</sub>, Lu<sub>2</sub>O<sub>3</sub>, Y<sub>2</sub>O<sub>3</sub>



Northern Minerals' next phase of drilling at Gambit West is planned to commence in late June, and will include diamond core drilling and further RC drilling to test the depth extent of mineralisation, which will provide additional data to contribute to an initial resource at the prospect.

At Gambit Central, eight RC drill holes were completed for 690m, most of which were designed to test a shallow high grade zone of mineralisation at the western end of drilling completed in 2012. One of these holes (BRGR0124) intersected high grade mineralisation with 16m (12-28m) @ 2.18% TREO. The drilling in this area has defined a near surface, continuous high-grade zone of mineralisation of at least 60m strike length. Mineralisation seems to have limited depth extent with drill holes completed beneath the near-surface zone, failing to intersect any significant mineralisation.

Drilling is also ongoing at the Wolverine deposit, with 11 holes drilled of an 8,000m campaign focused on extending the resource at depth. Assay results are currently pending for the completed drill holes, however portable XRF results have indicated HRE mineralisation outside of the current resource model

The drilling in 2013 has tested to depths of up to 350m vertical. The portable XRF and visual results indicate typical Wolverine style, breccia hosted mineralization down to 300m vertical where it remains open. Diamond drilling is currently continuing at Wolverine, while RC drilling is on-going at the Area 5 prospect.

Northern Minerals Managing Director George Bauk said the first results from the 2013 program had delivered on expectations, and would contribute to the planned resource upgrade later in the year.

"We are focused on increasing our HRE resource base at Browns Range, and we have a major program of drilling planned across high priority prospects to deliver this," Mr Bauk said.

"These initial results have enabled us to take a big step toward delivering on that target, and with a large amount of drilling still underway, we are looking forward to further exciting results".

"The results from Gambit West provide confidence that we can deliver a high grade resource at that prospect, while the early results from Wolverine indicate the mineralisation continues at depth as we had expected."

"Our aim is to extend our resource at Wolverine, and compliment that with new resources at Gambit West and Area 5, which we can build into our scoping studies for the Browns Range start-up operation."

#### **Gambit West and Gambit Central**

Assay results for the first 39 holes (BRGR0084 – BRGR0122) at Gambit West have been received with results from a further three holes currently awaited. Results for all eight RC holes completed at the Gambit Central prospect have been received.

The complete list of significant intercepts from the Gambit West and Gambit Central RC drilling is shown in Table 1 below. At Gambit West, mineralisation appears to be associated with an east-west trending hematitic and silicified fault and breccia zone.



**Table 1 – Gambit West and Gambit Prospects – Significant drill hole intercepts**

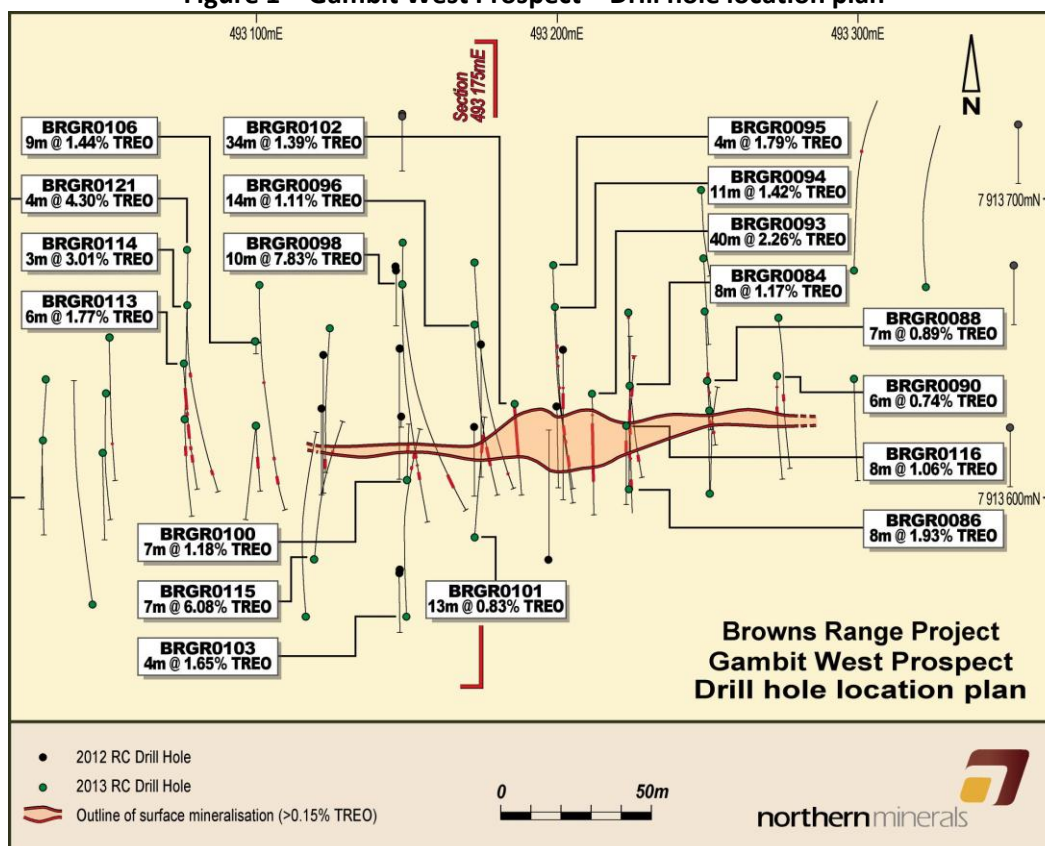
Prospect	Hole Number	From(m)	To(m)	Interval (m)	TREO (%)
Gambit West	BRGR0084	10	12	2	0.31
Gambit West	BRGR0084	26	42	16	0.50
Gambit West	BRGR0084	50	51	1	4.03
Gambit West	BRGR0084	65	73	8	1.17
Gambit West	BRGR0085	3	4	1	0.59
Gambit West	BRGR0085	30	32	2	0.23
Gambit West	BRGR0085	51	59	8	0.28
Gambit West	BRGR0085	102	107	5	0.57
Gambit West	BRGR0086	24	32	8	1.93
Gambit West	BRGR0086	39	53	14	0.71
Gambit West	BRGR0086	56	57	1	0.42
Gambit West	BRGR0086	60	61	1	1.10
Gambit West	BRGR0088	7	10	3	0.44
Gambit West	BRGR0088	26	33	7	0.89
Gambit West	BRGR0089	42	47	5	0.66
Gambit West	BRGR0089	79	80	1	0.37
Gambit West	BRGR0089	86	88	2	0.39
Gambit West	BRGR0090	7	8	1	0.34
Gambit West	BRGR0090	21	27	6	0.74
Gambit West	BRGR0091	53	58	5	0.64
Gambit West	BRGR0092	1	3	2	0.28
Gambit West	BRGR0093	10	11	1	0.61
Gambit West	BRGR0093	14	15	1	0.34
Gambit West	BRGR0093	20	60	40	2.26
Gambit West	BRGR0094	54	56	2	0.24
Gambit West	BRGR0094	59	70	11	1.42
Gambit West	BRGR0094	82	89	7	0.17
Gambit West	BRGR0094	92	95	3	0.60
Gambit West	BRGR0094	105	112	7	0.96
Gambit West	BRGR0095	54	58	4	1.79
Gambit West	BRGR0095	62	64	2	0.29
Gambit West	BRGR0095	68	69	1	0.36
Gambit West	BRGR0095	112	113	1	0.77
Gambit West	BRGR0095	131	137	6	0.46
Gambit West	BRGR0096	84	98	14	1.11
Gambit West	BRGR0097	150	151	1	2.24
Gambit West	BRGR0098	139	149	10	7.83
Gambit West	BRGR0099	150	155	5	0.60
Gambit West	BRGR0099	159	160	1	0.37
Gambit West	BRGR0099	164	171	7	0.60
Gambit West	BRGR0100	18	25	7	1.18
Gambit West	BRGR0101	58	71	13	0.83
Gambit West	BRGR0102	2	36	34	1.39
Gambit West	BRGR0103	105	109	4	1.65
Gambit West	BRGR0106	78	87	9	1.44
Gambit West	BRGR0107	66	67	1	0.42
Gambit West	BRGR0107	119	121	2	0.25
Gambit West	BRGR0107	132	138	6	0.63



Prospect	Hole Number	From(m)	To(m)	Interval (m)	TREO (%)
Gambit West	BRGR0108	23	25	2	0.18
Gambit West	BRGR0113	34	36	2	0.22
Gambit West	BRGR0113	57	63	6	1.77
Gambit West	BRGR0114	57	73	16	0.32
Gambit West	BRGR0114	83	94	11	0.32
Gambit West	BRGR0114	99	102	3	0.32
Gambit West	BRGR0114	108	111	3	3.01
Gambit West	BRGR0115	64	71	7	6.08
Gambit West	BRGR0115	76	78	2	0.17
Gambit West	BRGR0116	1	5	4	0.58
Gambit West	BRGR0116	9	17	8	1.06
Gambit West	BRGR0119	83	85	2	0.66
Gambit West	BRGR0121	86	90	4	0.76
Gambit West	BRGR0121	158	162	4	4.30
Gambit West	BRGR0122	74	75	1	0.48
Gambit	BRGR0124	12	28	16	2.18
Gambit	BRGR0125	59	60	1	0.52
Gambit	BRGR0126	10	11	1	0.31
Gambit	BRGR0127	9	13	4	0.24

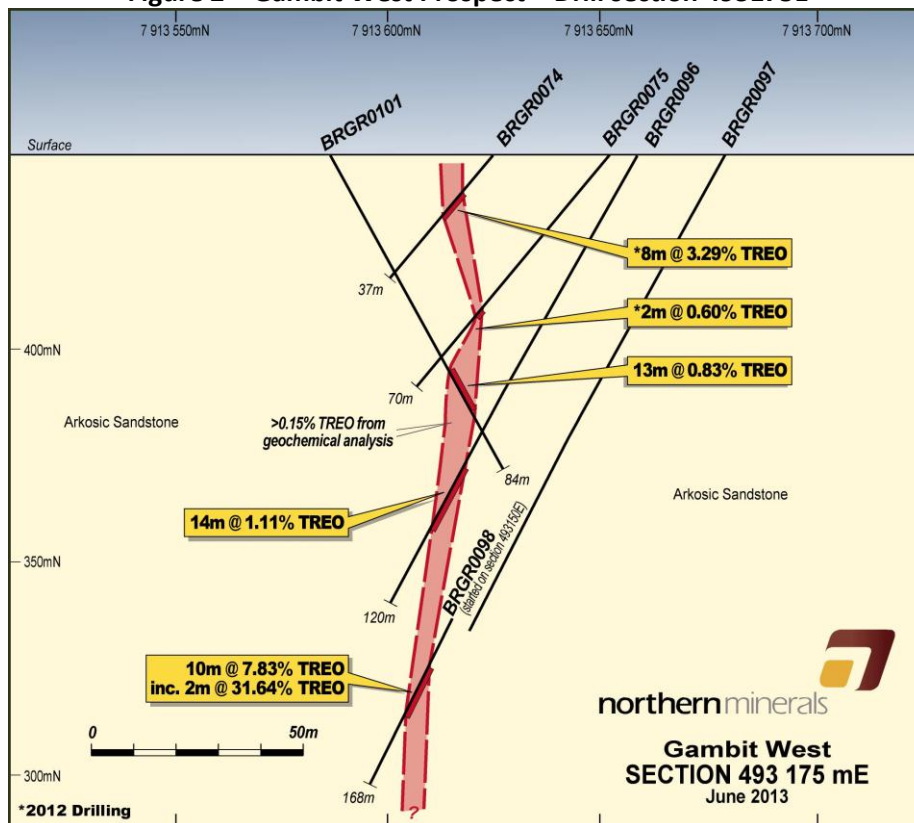
(mineralised intervals are downhole widths >2m @ 0.15% TREO, or 1m >0.30% TREO, not true widths. Intersections calculated using a 0.15% TREO cut-off and a maximum of 2m internal dilution. No top cut has been applied. Samples were submitted to Genalysis Laboratory for REE analysis using a FP6/OM Sodium Peroxide Fusion Digest

Figure 1 – Gambit West Prospect – Drill hole location plan





**Figure 2 – Gambit West Prospect – Drill section 493175E**



### Wolverine

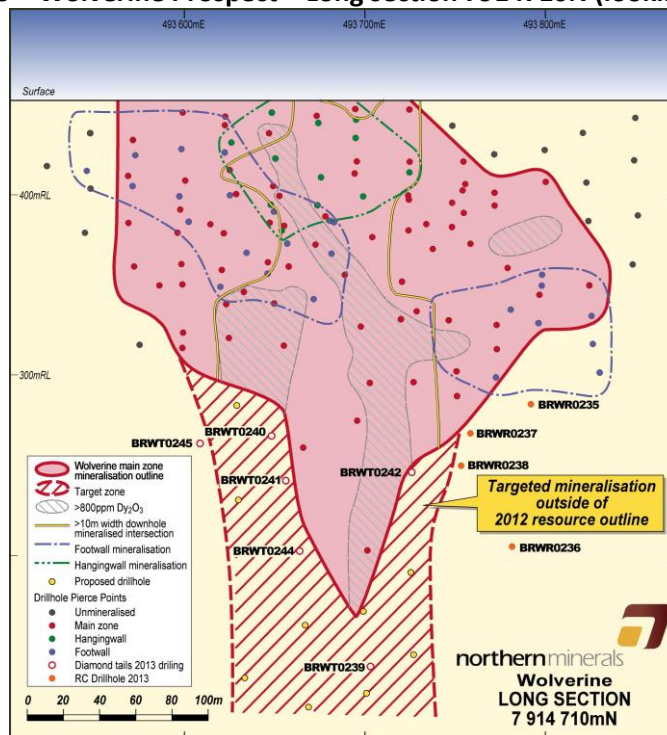
At the Wolverine HRE deposit, five RC drill holes for 1,212m and six diamond drill holes (with RC precollars) have been completed. Details of the drill holes are shown in Table 2 below. Figure 3 below shows a long section through the deposit and the location of the recently completed drill holes. All 6 diamond drill holes completed have intersected HRE mineralisation as indicated from portable XRF measurements of yttrium, and occasional visible xenotime.

**Table 2 – Wolverine prospect – Completed drill hole details**  
(Coordinates in GDA94 Zone 52)

Hole ID	Hole Type	East	North	RL	Precollar Depth (m)	EOH Depth(m)	Mag Azimuth	Dip
BRWR0235	RC	493776	7914820	450		246	186.5	-60
BRWR0236	RC	493774	7914852	450		324	196	-60
BRWR0237	RC	493751	7914823	450		270	186.5	-60
BRWR0238	RC	493750	7914845	450		276	196	-60
BRWT0239	RC & DD	493695	7914955	450	96	414	184	-65
BRWT0240	RC & DD	493649.8	7914851	451	95.1	222.5	190	-60
BRWT0241	RC & DD	493651	7914880	450	107.7	285.6	190	-60
BRWT0242	RC & DD	493724	7914858	450	138.3	276.6	184	-60
BRWT0243	RC	493651	7914902	450	96	96	186	-60
BRWT0244	RC & DD	493652	7914925	450	126	363.6	189	-60
BRWT0245	RC & DD	493602	7914876	450	108	246.6	185	-60



**Figure 3 – Wolverine Prospect – Long section 7914710N (looking north)**



### Cyclops

At the Cyclops prospect a total of 12 RC drill holes for 924m have been completed. These holes were designed to follow-up on mineralisation intersected during drilling at the prospect in 2012. Several drill holes intersected low grade HRE mineralisation with drill hole BRCR0008 returning the best result of 4m (50-54m) @ 1.81% TREO. No immediate follow-up drilling is planned at the Cyclops prospect.

**Table 3 – Cyclops Prospect – Significant drill hole intercepts**

Hole Number	From(m)	To(m)	Interval (m)	TREO (%)
BRCR0008	8	11	3	0.28
BRCR0008	50	54	4	1.81
BRCR0009	9	15	6	0.42
BRCR0009	30	31	1	0.65
BRCR0009	41	50	9	0.24
BRCR0010	37	47	10	0.32
BRCR0011	61	63	2	0.37
BRCR0011	69	80	11	0.31
BRCR0012	6	7	1	0.47
BRCR0012	17	18	1	0.43
BRCR0012	21	23	2	0.66
BRCR0017	20	22	2	0.19
BRCR0018	7	8	1	0.40
BRCR0018	63	64	1	0.31

(mineralised intervals are downhole widths >2m @ 0.15% TREO or 1m >0.30% TREO, not true widths. Intersections calculated using a 0.15% TREO cut-off and a maximum of 2m internal dilution. No top cut has been applied. Samples were submitted to Genalysis Laboratory for REE analysis using a FP6/OM Sodium Peroxide Fusion Digest)



**Table 4: Browns Range RC drill hole collar details – Gambit, Gambit West and Cyclops**  
*(Coordinates in GDA94 Zone 52)*

Hole Number	Easting	Northing	Drill Type	Mag Azimuth	Inclination	Total Depth	RL
BRCR0008	489738	7904630	RC	180	-60	120	450
BRCR0009	489734	7904551	RC	178	-61	60	432
BRCR0010	489739	7904654	RC	176.5	-60	60	432
BRCR0011	489780	7904550	RC	180	-60	96	450
BRCR0012	489790	7904679	RC	176.5	-60	78	450
BRCR0013	489837	7904571	RC	176.5	-60	60	450
BRCR0014	489836	7904597	RC	176	-60	66	450
BRCR0015	489834	7904631	RC	176.5	-60	60	450
BRCR0016	489711	7904584	RC	177	-60	60	450
BRCR0017	489711	7904606	RC	177	-60	72	450
BRCR0018	489713	7904625	RC	175.5	-60	102	450
BRCR0019	489712	7904659	RC	176.5	-60	90	450
BRGR0084	493223	7913639	RC	176.5	-60	90	447
BRGR0085	493224	7913662	RC	176.5	-60	120	445
BRGR0086	493225	7913602	RC	356.5	-60	90	447
BRGR0087	493251	7913603	RC	176.5	-60	78	447
BRGR0088	493251	7913636	RC	176.5	-60	78	447
BRGR0089	493254	7913656	RC	176.5	-60	96	447
BRGR0090	493275	7913640	RC	176.5	-60	72	447
BRGR0091	493275	7913661	RC	176.5	-60	108	447
BRGR0092	493301	7913639	RC	176.5	-60	78	447
BRGR0093	493212	7913639	RC	176.5	-60	84	447
BRGR0094	493205	7913669	RC	176.5	-60	138	447
BRGR0095	493201	7913678	RC	176.5	-60	156	447
BRGR0096	493175	7913658	RC	176.5	-60	120	447
BRGR0097	493172	7913675	RC	176.5	-60	162	447
BRGR0098	493150	7913671	RC	176.5	-60	168	444
BRGR0099	493150	7913685	RC	181.5	-60	204	444
BRGR0100	493152	7913606	RC	356.5	-60	42	444
BRGR0101	493172	7913586	RC	356.5	-60	84	444
BRGR0102	493189	7913631	RC	176.5	-60	60	444
BRGR0103	493152	7913560	RC	356.5	-60	132	444
BRGR0104	493123	7913654	RC	181.5	-60	102	450
BRGR0105	493101	7913622	RC	183.5	-60	66	444
BRGR0106	493101	7913652	RC	178.5	-60	102	444
BRGR0107	493103	7913670	RC	179.5	-60	156	444
BRGR0108	493077	7913627	RC	176.5	-60	66	444
BRGR0109	493055	7913615	RC	178.5	-60	60	444
BRGR0110	493051	7913636	RC	176.5	-60	90	444
BRGR0111	493031	7913619	RC	177.5	-60	66	444
BRGR0112	493034	7913643	RC	179.5	-60	90	444
BRGR0113	493075	7913645	RC	180	-60	108	444
BRGR0114	493080	7913665	RC	180.5	-60	132	444
BRGR0115	493119	7913579	RC	356.5	-60	102	444
BRGR0116	493222	7913625	RC	176.5	-50	42	444
BRGR0117	493251	7913678	RC	176.5	-60	60	444
BRGR0118	493258	7913705	RC	176.5	-60	60	444





Hole Number	Easting	Northing	Drill Type	Mag Azimuth	Inclination	Total Depth	RL
BRGR0119	493304	7913674	RC	354.5	-60	144	444
BRGR0120	493324	7913670	RC	351.5	-60	120	444
BRGR0121	493077	7913679	RC	179.5	-60	174	444
BRGR0122	493052	7913655	RC	178.5	-60	102	444
BRGR0123	493524	7913770	RC	356.5	-60	84	444
BRGR0124	493557	7913800	RC	176.50	-60	78	444
BRGR0125	493552	7913819	RC	176.50	-60	84	444
BRGR0126	493573	7913801	RC	176.50	-60	60	444
BRGR0127	493573	7913774	RC	356.50	-60	54	449
BRGR0128	493708	7913837	RC	176.50	-60	96	450
BRGR0129	493947	7913898	RC	182.50	-60	120	450
BRGR0130	493968	7913631	RC	356.50	-60	114	450
BRGR0131	493251	7913632	RC	356.50	-50	36	444
BRGR0132	493124	7913559	RC	176.50	-60	138	444
BRGR0133	493045	7913564	RC	176.50	-60	162	444

### Competent Persons Declaration

*The information in this report accurately reflects information prepared by competent persons (as defined by the Australasian Code for Reporting of Mineral Resources and Ore Reserves). It is compiled by Mr R Wilson, an employee of the Company who is a Member of The Australasian Institute of Mining and Metallurgy with the requisite experience in the field of activity in which he is reporting. Mr Wilson has sufficient experience which is relevant to the style of mineralisation and the type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent person as defined in the 2004 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Mr Wilson consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.*

### For more information:

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**About Northern Minerals:**

Northern Minerals Limited (ASX: NTU) is focused on development of rare earth elements (REE), with a large and prospective landholding in Western Australia and the Northern Territory. The Company's flagship project is Browns Range, where it has a number of prospects with high value HRE in xenotime mineralisation. In particular, the mineralisation includes high levels of dysprosium and yttrium, which are in short supply globally and expected to be increasingly sought after as world economies stabilise and recent trends in urbanisation and technology diffusion, particularly in Asia, accelerate. Following outstanding results from its drilling and metallurgical programs in 2012, the Company has delivered its maiden JORC resource, advancing Browns Range toward production, using a relatively simple and low cost processing flowsheet to produce a high grade mixed Rare Earth oxide. Northern Minerals also has a HRE exploration program underway at the geologically similar John Galt project. For more information, visit [www.northernminerals.com.au](http://www.northernminerals.com.au)

