



**ASX and Media Release**

**5 November 2012**

**MINERAL ASSEMBLAGE RESULTS CONFIRM HIGH ZIRCON CONTENT AT DAMPIER HMS PROJECT**

**KEY POINTS**

- Initial mineral assemblage testwork (QEMSCAN) indicates a high value, zircon-rich mineral assemblage for the Thunderbird deposit
- High in situ zircon content of 0.6% indicated for the high grade (9% HM) central portion of deposit
- Drilling results and mineral assemblage testwork continue to demonstrate Thunderbird has the hallmarks of a Tier 1 zircon deposit

Mineral sands explorer Sheffield Resources (“Sheffield”) (ASX:SFX) today announced initial mineral assemblage testwork results from its Dampier heavy mineral sand (HMS) project near Derby in the Kimberley Region of Western Australia, confirming the anticipated high in-situ zircon content of the Thunderbird HMS discovery.

Significantly, the mineral assemblage results indicate a high in situ zircon content of 0.6% for the High Grade domain. This figure is derived from multiplying the average zircon content of 6.6% by the average grade within the High Grade domain of 9.0% HM. The High Grade domain averages 15m thickness over an area of 12km<sup>2</sup> and remains open in all directions (see Figure 1 and ASX release dated 19 September 2012).

Managing Director, Bruce McQuitty said the results place Thunderbird in the top tier of zircon deposits worldwide.

*“There are few heavy mineral sands deposits of this scale with higher in situ zircon content. The Thunderbird discovery is proving to be both high grade and large scale, presenting an outstanding opportunity for Sheffield to emerge as a major HMS developer.”*

The mineral assemblages have been determined using QEMSCAN on 35 composited HM samples derived from 14 drill holes. The composites were selected from high, medium and low grade ‘domains’, corresponding to 5% HM, 2% HM and 1% HM cut-offs, respectively. Averages for the high and medium grade domains are summarised below in Table 1 (see Tables 2-5 for full details).

**Table 1: Averages of Mineral Assemblage Results from High and Medium Grade Domains**

Domain	Zircon %	Rutile %	High-Ti Leucoxene %	Leucoxene %	Altered Ilmenite %	Ilmenite %
High Grade	6.6	1.0	1.2	2.3	4.5	25.5
Medium Grade	7.9	1.5	1.7	3.7	9.2	25.1

*TiO<sub>2</sub> minerals are defined according to the following ranges: Rutile >98% TiO<sub>2</sub>; High-Ti Leucoxene 90-98% TiO<sub>2</sub>; Leucoxene 70-90% TiO<sub>2</sub> Altered Ilmenite 60-70% TiO<sub>2</sub>; Ilmenite 40-60% TiO<sub>2</sub>.*

For the high and medium grade domains, the initial mineral assemblage averages 7.1% zircon, 1.2% rutile, 1.4% high Ti Leucoxene, 2.9% leucoxene, and 31.7% ilmenite, with the zircon content ranging up to 12.3% in certain sections of the deposit.

These results indicate significant mineralogical variability within the thick, high-grade heavy-mineral intervals. However, the composite samples were selected from just 14 of the first 71 drill holes for which assay results have been received. Further QEMSCAN analyses will be undertaken once assay results from the remaining 93 holes of the maiden drilling programme have been received.

Composite samples were first screened at 212µm, with the minus 212µm fraction submitted for QEMSCAN analysis. The plus 212 µm fraction contains aggregated heavy mineral grains.

Additional heavy mineral may be liberated from these aggregates by more aggressive scrubbing and attritioning steps prior to concentration. This will be investigated by metallurgical testwork, which is currently underway.

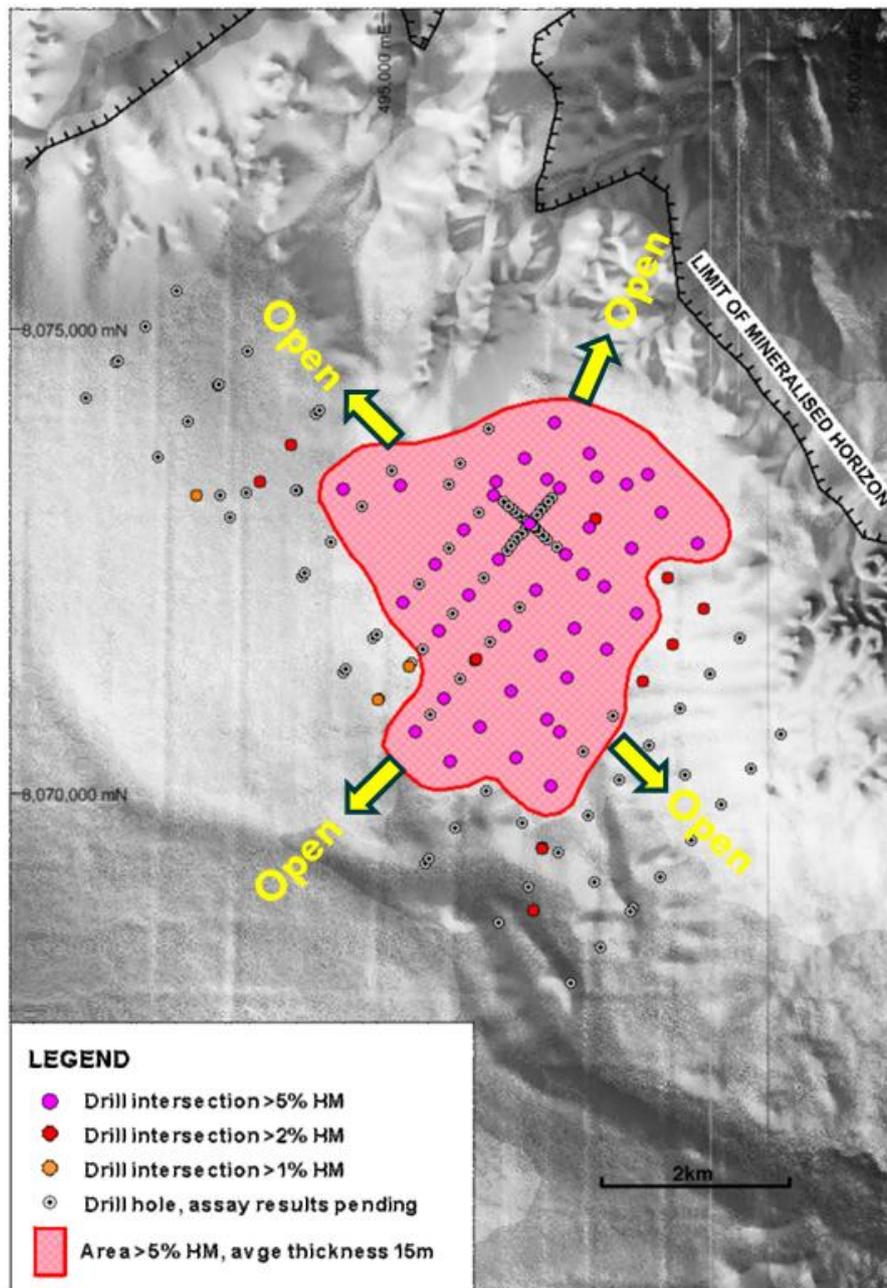


Figure 1: Summary plan of results of the 71 drill holes received to date, showing the 12km<sup>2</sup> area containing intersections greater than 5% HM on a greyscale elevation image. Grades within this area average 9.0% HM and the mineralisation averages 15m thickness.

## About the Thunderbird Prospect

The Dampier project contains two significant heavy mineral sands prospects: a large, shallow eastern zone, named Thunderbird; and a smaller, deeper western zone, named Argo.

Sheffield's maiden drilling programme tested the Thunderbird prospect over an 8km strike length. The drilling pattern is nominally 500m x 500m at the centre of the target area to 500m x 1,000m at the strike extremities (Figures 1 & 2).

Drill results released to date relate to an area about 5km long by 4km wide (20km<sup>2</sup>). At a 2% HM cut-off, the main mineralised zone varies in thickness from 4.5m to 43.6m, with an average of 25m. There is a higher-grade core (>5% HM) to the mineralised zone which varies in thickness from 4.5m to 32.5m, with an average thickness of 15m over an area of 12km<sup>2</sup>. The mineralisation shows excellent continuity and remains open in all directions (Figure 1). It is hosted in fine loose sand, with minor 30-50cm bands of cemented sand and ironstone.

Overburden thickness averages 10m, increasing with the dip of the mineralised unit towards the southwest. Significantly, over half of the mineralisation outlined to date (2.5km across strike) has less than 3m of overburden.

Further information on the Thunderbird prospect is contained in the Company's ASX releases of 7 September 2011, 8 November 2011, 12 July 2012, 3 September 2012 and 19 September 2012.

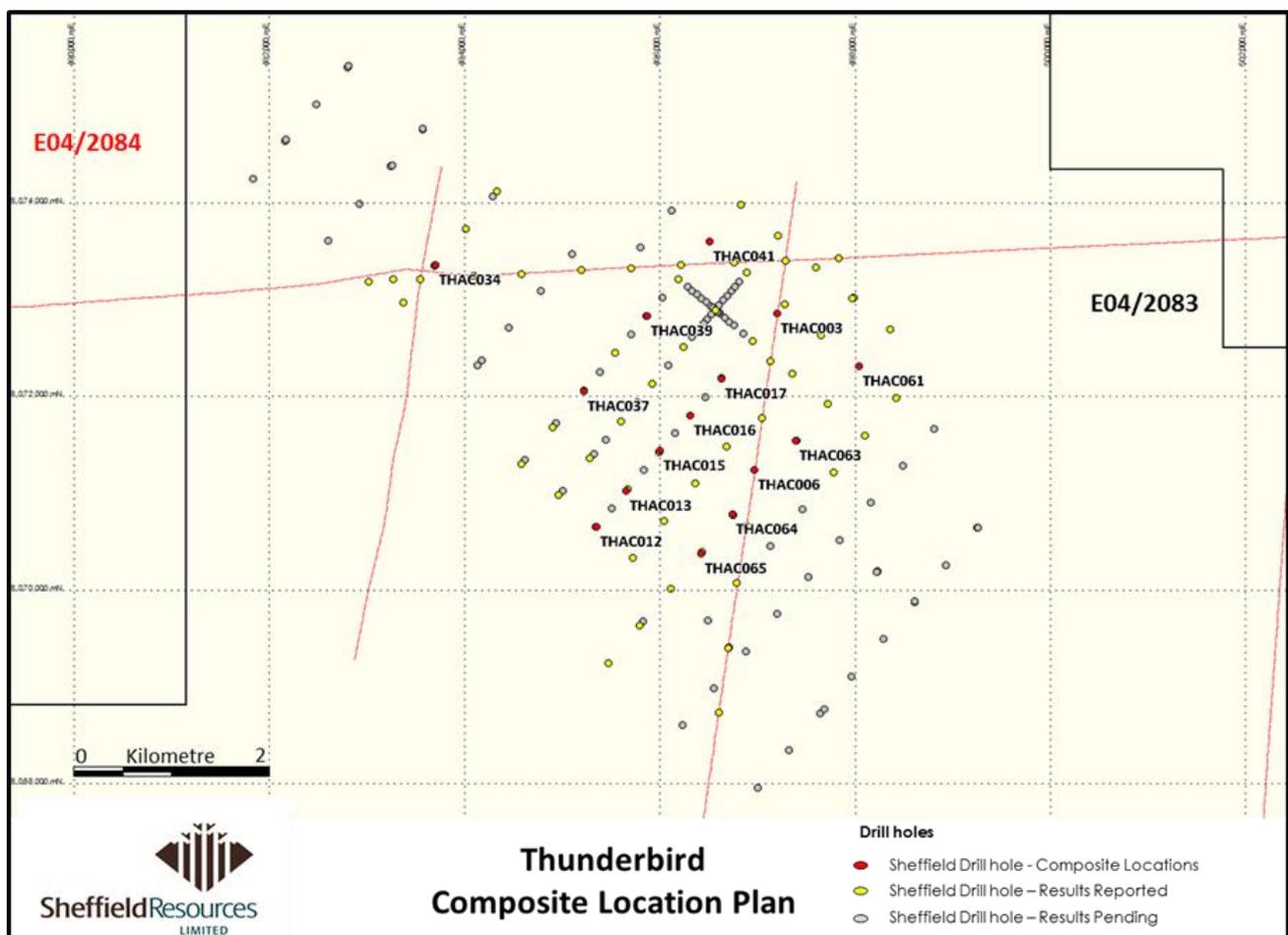


Figure 2: Thunderbird prospect drill collar plan showing location of drill holes from which composite samples were obtained for QEMSCAN mineral assemblage analyses





**Table 4: Initial QEMSCAN – Low Grade Domain**

Comp_ID	THCP003	THCP014	THCP026	THCP029	THCP030	THCP037
HM%	2.09	1.43	1.45	1.41	1.35	1.15
Rutile/Anatase %	0.5	1.6	2.1	1.2	2.0	2.5
High Ti Leucoxene %	0.7	1.6	2.9	1.7	2.1	3.2
Leucoxene %	1.4	2.7	6.2	2.7	7.0	11.4
Altered Ilmenite %	2.1	4.9	17.4	3.7	14.8	19.9
Ilmenite %	14.6	21.0	15.7	22.2	8.1	9.3
Titano Magnetite %	0.8	0.9	0.9	1.4	0.7	0.4
Titano Magnetite Coated %	0.6	0.1	0.1	0.1	0.1	0.1
Si bearing Ti oxide %	1.6	2.7	5.8	3.8	4.4	5.3
Zircon %	3.2	7.4	4.6	6.6	6.5	7.5
Cemented HM Particles %	18.7	7.3	5.0	14.8	6.2	6.2
Quartz %	6.1	7.0	5.2	7.8	5.1	4.7
REE-bearing %	0.1	0.4	0.2	0.3	0.3	0.3
Fe Oxide %	12.3	6.9	2.8	11.5	6.6	3.5
Silicates %	3.9	1.9	7.0	3.0	4.2	6.1
sub-total %	66.6	66.5	75.7	80.8	68.1	80.4
Plus 212 µm aggregates %	33.4	33.5	24.3	19.2	31.9	19.6
<b>TOTAL</b>	100.0	100.0	100.0	100.0	100.0	100.0

Total particle chemistry is used in the mineral classification. TiO<sub>2</sub> minerals are defined according to the following ranges: Rutile >98% TiO<sub>2</sub>; High-Ti Leucoxene 90-98% TiO<sub>2</sub>; Leucoxene 70-90% TiO<sub>2</sub> Altered Ilmenite 60-70% TiO<sub>2</sub>.; Ilmenite 40-60% TiO<sub>2</sub> and Titanomagnetite <40% TiO<sub>2</sub>. "Coated" refers to particles which have >80% coatings. Refer to Table 5 for details of composite samples.

**Table 5: Location of Composite sample holes. Coordinate system is MGA Zone 51 (GDA94), all holes drilled vertically.**

Comp_ID	Hole_ID	MGA_E(m)	MGA_N(m)	From(m)	To(m)
THCP001	THAC041	496509	8073604	0.0	10.5
THCP002	THAC041	496509	8073604	10.5	30.0
THCP003	THAC037	495219	8072059	15.0	21.0
THCP003	THAC039	495865	8072834	0.0	4.5
THCP003	THAC041	496509	8073604	30.0	43.5
THCP004	THAC039	495865	8072834	4.5	9.0
THCP004	THAC039	495865	8072834	24.0	35.5
THCP005	THAC039	495865	8072834	9.0	24.0
THCP006	THAC037	495219	8072059	21.0	30.0
THCP006	THAC037	495219	8072059	45.0	47.9
THCP007	THAC037	495219	8072059	30.0	45.0
THCP008	THAC003	497203	8072857	0.0	1.5
THCP008	THAC003	497203	8072857	9.0	33.0
THCP009	THAC003	497203	8072857	1.5	9.0
THCP011	THAC017	496630	8072190	1.5	3.0
THCP011	THAC017	496630	8072190	19.5	30.0

Comp_ID	Hole_ID	MGA_E(m)	MGA_N(m)	From(m)	To(m)
THCP012	THAC017	496630	8072190	3.0	12.0
THCP012	THAC017	496630	8072190	18.0	19.5
THCP013	THAC017	496630	8072190	12.0	18.0
THCP014	THAC016	496305	8071804	33.0	42.0
THCP014	THAC017	496630	8072190	30.0	40.5
THCP015	THAC016	496305	8071804	3.0	7.5
THCP016	THAC016	496305	8071804	7.5	13.5
THCP017	THAC016	496305	8071804	13.5	18.0
THCP018	THAC016	496305	8071804	18.0	22.5
THCP019	THAC016	496305	8071804	22.5	27.0
THCP020	THAC016	496305	8071804	27.0	30.0
THCP021	THAC016	496305	8071804	30.0	33.0
THCP023	THAC013	495651	8071026	25.5	36.0
THCP024	THAC013	495651	8071026	36.0	43.5
THCP025	THAC012	495347	8070660	37.5	39.0
THCP025	THAC013	495651	8071026	24.0	25.5
THCP025	THAC015	495996	8071439	16.5	24.0
THCP026	THAC012	495347	8070660	31.5	37.5
THCP026	THAC013	495651	8071026	22.5	24.0
THCP026	THAC015	495996	8071439	13.5	16.5
THCP028	THAC061	498040	8072314	4.5	19.5
THCP029	THAC061	498040	8072314	19.5	31.5
THCP030	THAC063	497394	8071547	4.5	6.0
THCP030	THAC063	497394	8071547	27.0	48.0
THCP031	THAC063	497394	8071547	6.0	7.5
THCP031	THAC063	497394	8071547	22.5	27.0
THCP032	THAC063	497394	8071547	7.5	12.0
THCP032	THAC063	497394	8071547	19.5	22.5
THCP033	THAC063	497394	8071547	12.0	19.5
THCP034	THAC064	496745	8070790	16.5	27.0
THCP035	THAC064	496745	8070790	27.0	36.0
THCP036	THAC006	496968	8071247	6.0	12.0
THCP036	THAC064	496745	8070790	15.0	16.5
THCP036	THAC064	496745	8070790	36.0	40.5
THCP036	THAC065	496425	8070382	10.5	24.0
THCP037	THAC006	496968	8071247	3.0	6.0
THCP037	THAC006	496968	8071247	48.0	61.5
THCP037	THAC064	496745	8070790	4.5	15.0
THCP038	THAC034	493696	8073358	46.5	76.5

ENDS

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#### **COMPETENT PERSONS' STATEMENT**

The information in this announcement that relates to exploration results is based on information compiled by Mark Teakle. Mr Teakle is a full time employee of the Company. Mr Teakle is a Member of the Australasian Institute of Geoscientists and a Member of the Australasian Institute of Mining and Metallurgy and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and the activity to which they are undertaking to qualify as Competent Person as defined in the 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves ("JORC Code")'. Mr Teakle consents to the inclusion in the report of the matters based on their information in the form and context in which it appears.

#### **FORWARD LOOKING STATEMENTS**

Some statements in this announcement regarding estimates or future events are forward-looking statements. They involve risk and uncertainties that could cause actual results to differ from estimated results. Forward-looking statements include, but are not limited to, statements concerning the Company's exploration programme, outlook, target sizes and mineralised material estimates. They include statements preceded by words such as "expected", "planned", "target", "scheduled", "intends", "potential", "prospective" and similar expressions.

## ABOUT SHEFFIELD RESOURCES

Sheffield Resources Limited (**Sheffield**) is a rapidly emerging heavy mineral sands (HMS) company.

ASX Code – SFX

Market Cap @ 69.5cps - \$68.6m

Issued shares – 98.7m

Cash - \$7.3m (at 30/9/2012)

The Company has over 6,000km<sup>2</sup> of highly prospective tenure, all situated within the state of Western Australia.

### HEAVY MINERAL SANDS

The Dampier project, located near Derby in WA's Kimberley region, contains the large, high grade zircon-rich Thunderbird HMS deposit.

The Eneabba project comprises multiple HMS deposits and is located near Eneabba approximately 140km south of the port of Geraldton in WA's Mid-West region.

Sheffield is also evaluating the large McCalls chloride ilmenite project, located 110km to the north of Perth.

### NICKEL-COPPER

Sheffield's 525km<sup>2</sup> Red Bull project is located in the highly prospective Fraser Complex within 20km of Sirius Resources NL's (ASX:SIR) Nova Ni-Cu discovery.

### IRON

Sheffield has identified iron mineralisation on three of its tenements in the Pilbara iron ore province. Thick hematite mineralisation was intersected in first pass RC drilling at the Three Pools project, 20km north of Newman.

### TALC

Sheffield's large Moora Talc Belt project contains numerous talc occurrences and is located near Imery's long-life Three Springs talc mine in WA's Mid-West region. The Company is targeting high purity talc, similar to that produced from the simple quarrying operation at Three Springs.