ASX Announcement 19th August 2025

Oonagalabi confirms heavy mineral suite (HMS); seeking commercial partners

Litchfield Minerals Limited (ASX: LMS) ("Litchfield" or "the Company") is pleased to report results from independent mineralogical test work (QEMSCAN and XRD) completed on samples from the Oonagalabi Project, Northern Territory. The work confirms that the **heavy mineral suite (HMS) is dominated by garnet and pyroxenes** across the tested size fractions.

Key results

- **HMS dominated by garnet and amphiboles:** Modal mineralogy shows garnet (almadine-dominated), amphiboles and pyroxenes (ortho- and clinopyroxene species) as the principal heavy minerals across multiple size classes.
- **Consistent assemblage across fractions:** The dominant phases persist through the principal size fractions used for processing assessment, indicating potential for stable product specifications.
- **Favourable liberation characteristics:** Liberation and association analyses indicate garnet/pyroxene grains are commonly present as discrete to simply associated grains, supportive of conventional gravity and magnetic separation flowsheets.
- **Accessory phases present:** Minor to trace contributions from other silicates and oxide phases were identified and will inform beneficiation settings and product quality control (e.g., magnetite/ilmenite, zircon/rutile, apatite).
- **Methodology and quality:** Results are based on integrated XRD confirmation of phase identity and automated mineralogy (QEMSCAN) for modal abundance, particle size, liberation, and locking, reported 12 June 2025.

Managing Director's comment

"Preliminary mineralogical work indicates the Oonagalabi HMS is garnet- and pyroxene-dominant. Confirming this assemblage would open a parallel industrial-minerals opportunity alongside our copper-zinc exploration. We are moving quickly to identify and engage experienced processors and potential offtake partners to assess product specifications, flowsheet options and potential market entry for a garnet-rich product."

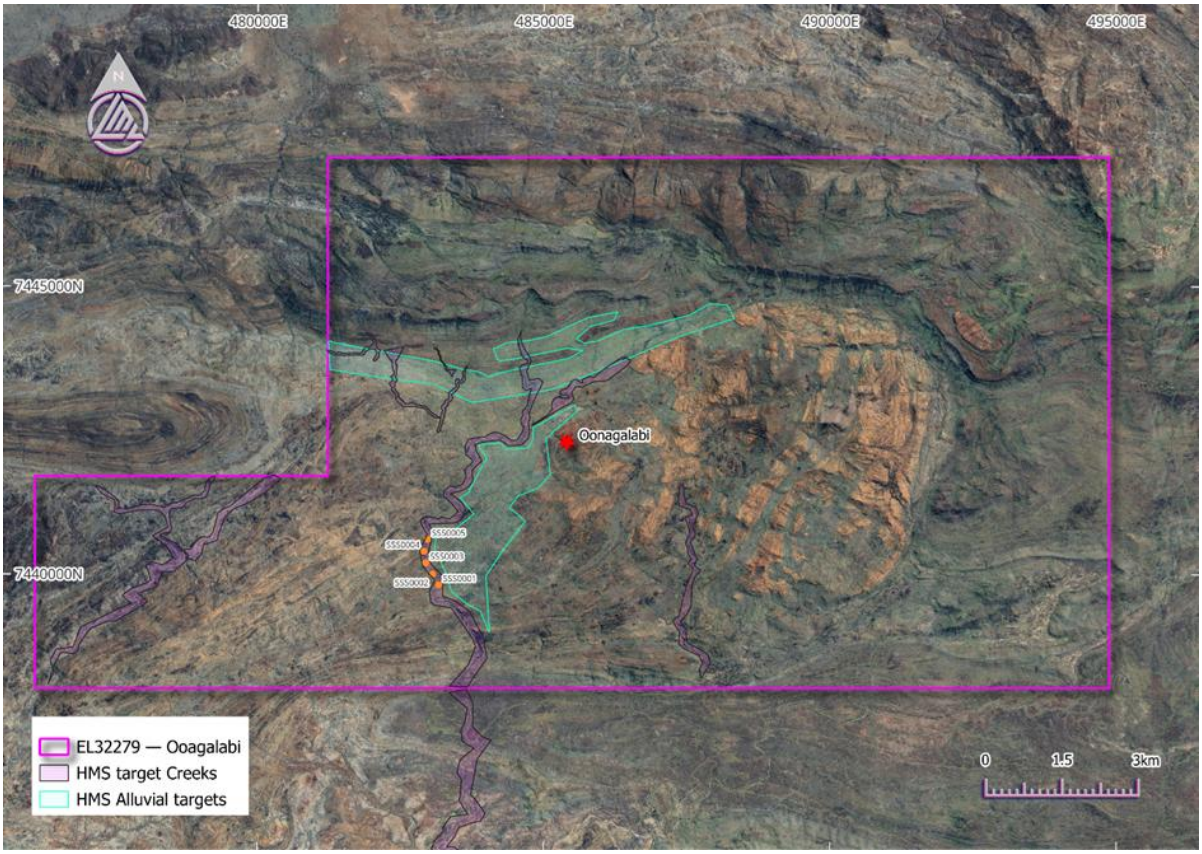


***Figure 1**. EL 32279 showing the location of the five bulk samples and identified alluvial target zones.*

Litchfield Minerals Limited (ASX: LMS) ("Litchfield" or "the Company") advises that it has received results from the QEMSCAN and XRD test work carried out on its Oonagalabi Project located in the Harts Range, 125km northeast of Alice Springs, following the initial bulk sampling results announced on 12 June 2025[1].

All five bulk samples (**Figure 1, Appendix 1**) were selected for Quantitative Evaluation of Minerals by Scanning electron microscopy (QEMSCAN) and quantitative X-ray diffraction analysis (XRD). QEMSCAN provides bulk mineralogy, particle grain size and shape, mineral associations and mineral liberation data and XRD provides weight percentages of the key mineral groups.

Both techniques are standard analytical methods for heavy mineral sands characterisation. These outcomes provide an initial basis to evaluate **industrial mineral product options**, primarily garnet for abrasives/waterjet applications and potential amphibole/pyroxene-rich products where market specifications can be met.

[1] ASX Announcement – 12 June 2025- *Litchfield identifies up to 44.9% HMS in first pass exploration*

Summary of QEMSCAN results

- **Quantitative Mineralogy:** Results show samples are dominated by garnet (23.1%- 36.1%) and amphibole/Ca pyroxene (53.9%- 69.3%) with minor amounts of ilmenite (0.9% – 1.6%), titanite (0.3%- 0.8%) and apatite (0.2%- 0.3%), **Table 1**, **Appendix 2, 4**.
- **Size response:** The garnet/amphibole/pyroxene dominance is observed across the key processing size bins assessed in sizing assays (100 – 600µm), with liberation improving in mid-to-coarse fractions typically targeted for garnet products, **Table 2**.
- **Liberation**: Garnet and amphibole/Ca pyroxene show generally high liberation percentages, REE Minerals range from very high to unliberated and apatite can be considered unliberated/ locked (**Table 3**).

Table 1. QEMSCAM main mineral abundances (Mineral mass %)

Sample ID		SSS0001	SSS0002	SSS0003	SSS0004	SSS0005
Mineral Mass %	Rutile/Anatase	0.0	0.0	0.0	0.0	0.1
	Ilmenite	0.9	1.6	1.4	1.5	1.1
	Ti Si Intergrowths	0.1	0.1	0.1	0.1	0.1
	Titanite	0.4	0.4	0.3	0.8	0.5
	Zircon	0.0	0.0	0.0	0.0	0.0
	Carbonates	0.0	0.0	0.0	0.0	0.0
	Monazite	0.0	0.0	0.0	0.0	0.0
	Xenotime	0.0	0.0	0.0	0.5	0.0
	Crandallite Group	0.0	0.0	0.0	0.0	0.0
	Apatite	0.2	0.3	0.2	0.3	0.2
	Fe Ox/OH	1.3	1.7	0.9	2.1	0.9
	Spinels	0.0	0.0	0.0	0.0	0.0
	Quartz	2.8	2.5	1.7	2.1	1.9
	K-feldspar	0.2	0.1	0.2	0.1	0.0
	Plagioclase	1.0	1.4	0.9	0.9	0.9
	Andalusite	0.1	0.0	0.0	0.0	0.0
	Tourmaline	0.2	0.2	0.1	0.2	0.2
	Garnet	23.1	21.2	33.4	36.1	29.9
	Ca Pyroxene/Amphibole	68.0	69.3	59.2	53.9	63.2
	Biotite	0.4	0.3	0.2	0.4	0.2
	MgFe Pyroxene/Amphibole	1.0	0.7	0.8	0.5	0.5
	Other Silicates	0.3	0.3	0.4	0.3	0.2
	Sulphides	0.0	0.0	0.0	0.0	0.0
	Others	0.0	0.1	0.0	0.0	0.0
TOTAL		100.0	100.0	100.0	100.0	100.0

Table 2. *Garnet Grainsize Distribution (mineral mass % µm)*

Sample ID		SSS0001	SSS0002	SSS0003	SSS0004	SSS0005
Wt. % Garnet		23.1	21.2	33.4	36.1	29.9
Mineral Mass % (µm)	0-10	0	0	0	0	0
	10-20	1	1	0	0	0
	20-30	0	1	0	0	0
	30-40	0	0	0	0	0
	40-50	0	0	0	0	0
	50-60	0	0	0	1	0
	60-70	0	0	0	0	0
	70-80	1	0	1	1	0
	80-90	1	2	0	1	0
	90-100	1	1	0	1	1
	100-200	16	6	11	12	11
	200-300	23	20	17	15	20
	300-400	23	15	21	21	19
	400-500	13	23	26	16	22
	500-600	10	15	9	9	13
	600-700	2	13	7	14	6
	700-800	9	0	4	4	5
	800-900	0	0	3	3	2
	900-1000	0	0	0	0	0
	1000-2000	0	3	0	0	0
	2000-3000	0	0	0	0	0
	3000-4000	0	0	0	0	0
	4000-5000	0	0	0	0	0
TOTAL		100	100	100	100	100
Est P80 (µm)		517	575	525	607	544

Sample ID		SSS0001	SSS0002	SSS0003	SSS0004	SSS0005
Mineral Mass % Liberated	Garnet	87	89	89	86	83
	Ca Pyroxene/Amphibole	87	83	88	85	89
	REE Minerals	91	0	0	99	0
	Apatite	3	32	2	28	19
	Silicates	99	99	99	99	99

Summary of XRD results

- Quantitative Mineralogy: Results show samples are dominated by the garnet group (20% – 36% with 65% almandine / 35% pyrope), amphibole group (53% – 69%) and pyroxene (3%- 4%) group of minerals, in line with QEMSCAN results. See Appendices 3 and 4 for comparison with QEMSCAN results.

Table 4. Quantitative XRD results (crystalline - wt.%)

Mass (%)		SSS0001	SSS0002	SSS0003	SSS0004	SSS0005
Minerals	Rutile group	0	0	0	0	0
	Ilmenite group	1	1	1	1	1
	Garnet group	22	20	32	36	28
	Quartz	3	4	3	3	3
	Amphibole group	67	69	57	53	63
	Mica group	2	1	1	1	1
	Pyroxene group	4	4	3	4	3
	Spinel group	1	1	1	1	1
	Calcite	0	0	0	0	0
	Fluorite	0	0	0	0	0
TOTAL		100	100	100	100	100
Unassigned peak		Tr	Tr	Tr	Tr	Tr

Commercial pathway and partnerships

Litchfield is **seeking expressions of interest from commercial partners** with capability in:

- Garnet and industrial mineral processing (test work and tolling).
- Product qualification for abrasives/waterjet, blasting and filtration markets.
- Offtake, marketing and distribution of garnet and related industrial mineral products.

Partnership scope may include sighter and bench-scale test work, bulk sampling, pilot processing, product specification/QA, and market qualification. 'Sighter' test work establishes whether the metals can be extracted from the ore easily or not.

Potential Next steps

1. **Sighter beneficiation:** Gravity/magnetic separation tests on representative composites to produce first pass garnet-rich concentrates and assess pyroxene behaviour.
2. **Product specification & QA:** Screening, grading and contaminant control checks against common industrial garnet specifications (e.g., chloride, soluble salts, free silica, Fe-oxides, heavy metal limits).
3. **Bulk sampling & pilot:** If results are positive, collect a bulk sample for pilot runs to generate graded products for customer trials.
4. **Market engagement:** Issue samples to prospective offtakers and industrial users; progress MoUs and pricing frameworks.
5. **Logistics & costs:** Preliminary operating and logistics scoping (processing, grading, bagging, transport) to underpin a commercial study.

Cautionary Statement

This announcement contains forward-looking statements that involve known and unknown risks, uncertainties, and other factors that may cause actual results, performance, or achievements to differ materially from those expressed or implied. Such statements include but are not limited to, interpretations of geophysical data, planned exploration activities, and potential mineralisation outcomes. Forward-looking statements are based on Litchfield Minerals Limited's current expectations, beliefs, and assumptions, which are subject to change in light of new information, future events, and market conditions. While the Company believes that such expectations and assumptions are reasonable, they are inherently subject to business, geological, regulatory, and operational risks. Further work, including drilling, is required to determine the economic significance of any anomalies identified. Investors should not place undue reliance on forward-looking statements. Litchfield Minerals Limited disclaims any obligation to update or revise any forward-looking statements to reflect events or circumstances after the date of this announcement, except as required by law.

About Litchfield Minerals

Litchfield Minerals is a critical mineral explorer, primarily searching for base metals and uranium out of the Northern Territory of Australia. Our mission is to be a pioneering copper exploration company committed to delivering cost-effective, innovative and sustainable exploration solutions. We aim to unlock the full potential of copper and other mineral resources while minimising environmental impact, ensuring the longevity and affordability of this essential metal for future generations. We are dedicated to involving cutting-edge technology, responsible practices and stakeholder collaboration drives us to continuously redefine the industry standards and deliver value to our investors, communities and the world.

The announcement has been approved by the Board of Directors.

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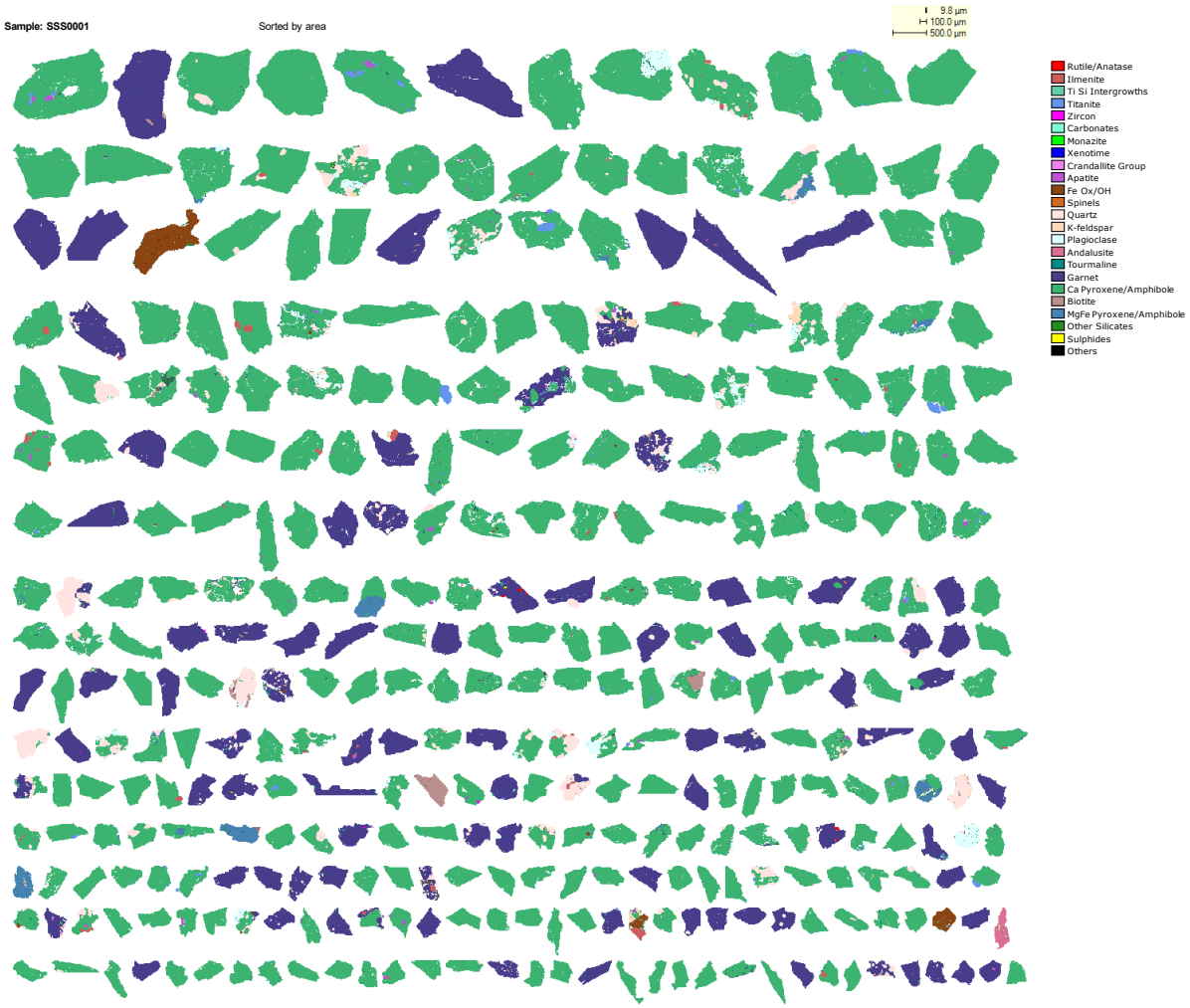
Competent Person's Statement

The information in this announcement relates to Exploration Results and is based on, and fairly represents, information and supporting documentation compiled by Mr Russell Dow (MSc, BSc Hons Geology), a Competent Person who is a Member of the Australian Institute of Mining and Metallurgy (AUSIMM) and is a full-time employee of Litchfield Minerals Limited. Mr Dow has sufficient sampling experience that is relevant to the style of mineralisation and types of deposits under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves" (JORC Code). Additional specialist advice has been provided by Mr Simon Tear (H&S Consultants Pty Ltd). Mr Dow and Mr Tear individually consent to the inclusion in the Public Report of the matters based on their information in the form and context in which it appears. With regard to the Company's ASX Announcements referenced in the above Announcement, the Company is not aware of any new information or data that materially affects the information included in the Announcements.

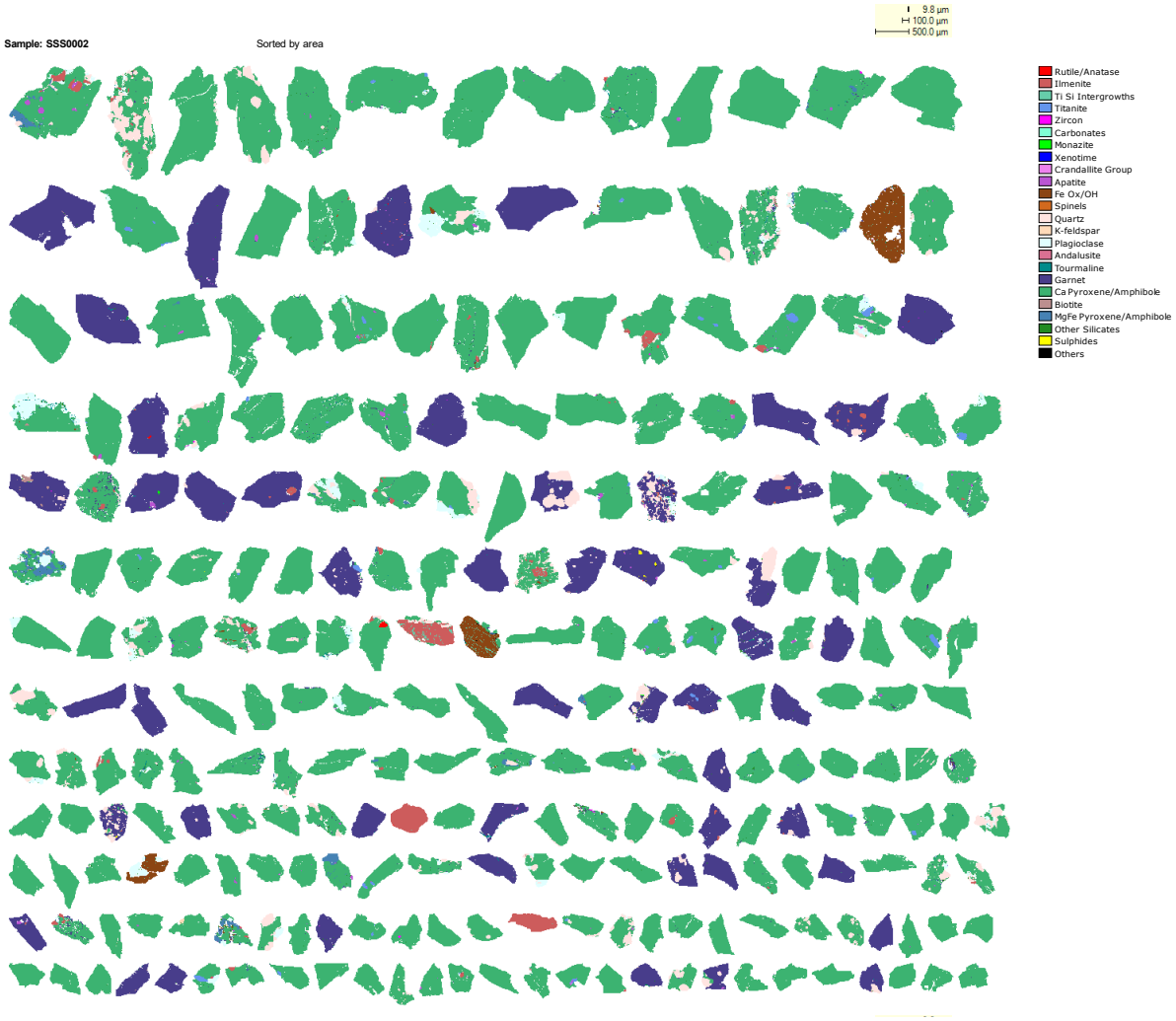
Appendix 1. Sample Location Data

Sample_#	GDA94_East_Zone 53	GDA94_North_Zone 53	RL	Comment
SSS0001	483166	7439816	736	Middle of stream north of tree, approx 5% visible coarse-grained garnet
SSS0002	483060	7440004	735	Middle of stream, approx 5-7% coarse-grained garnet
SSS0003	482944	7440198	737	Thin, sandy deposits on bedrock river base, approx 15-25% coarse-grained garnet
SSS0004	482910	7440402	738	Coarse river sand on natural rocky base trap site, approx 10% coarse-grained garnet
SSS0005	482972	7440608	739	Coarse river sand, approx 20% corase-grained garnet

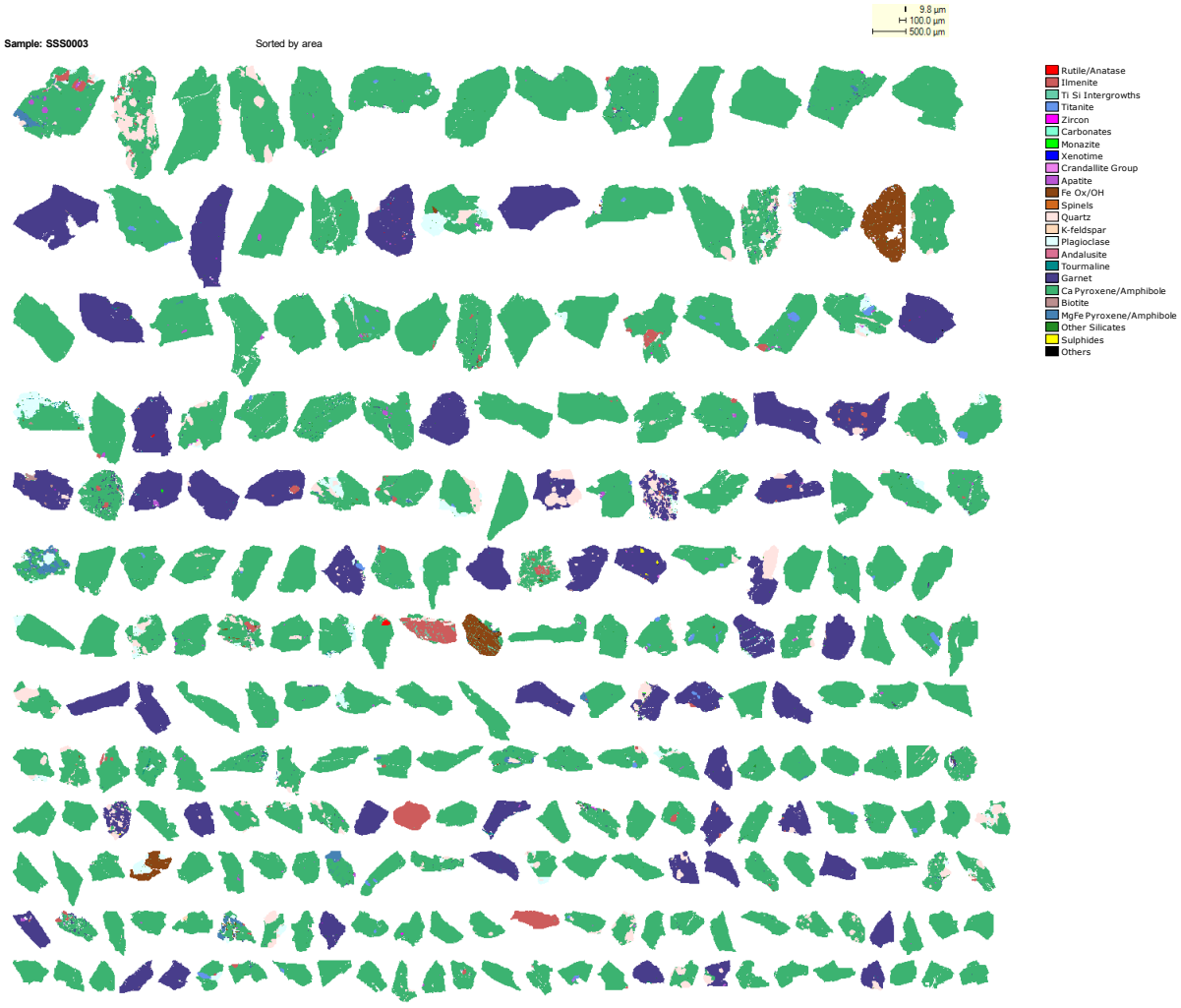
Appendix 2. QEMSCAN Images



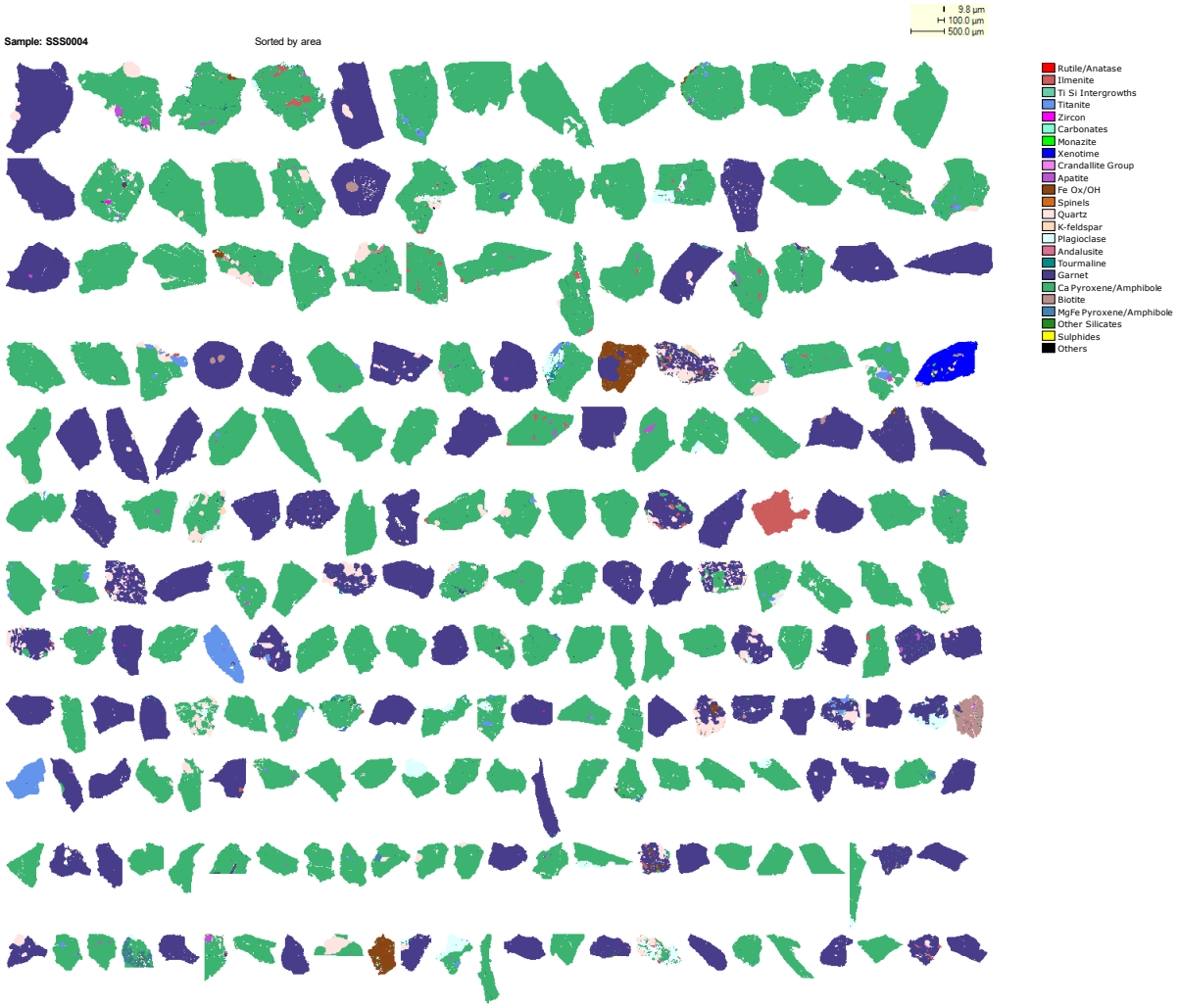
Sample SSS0001



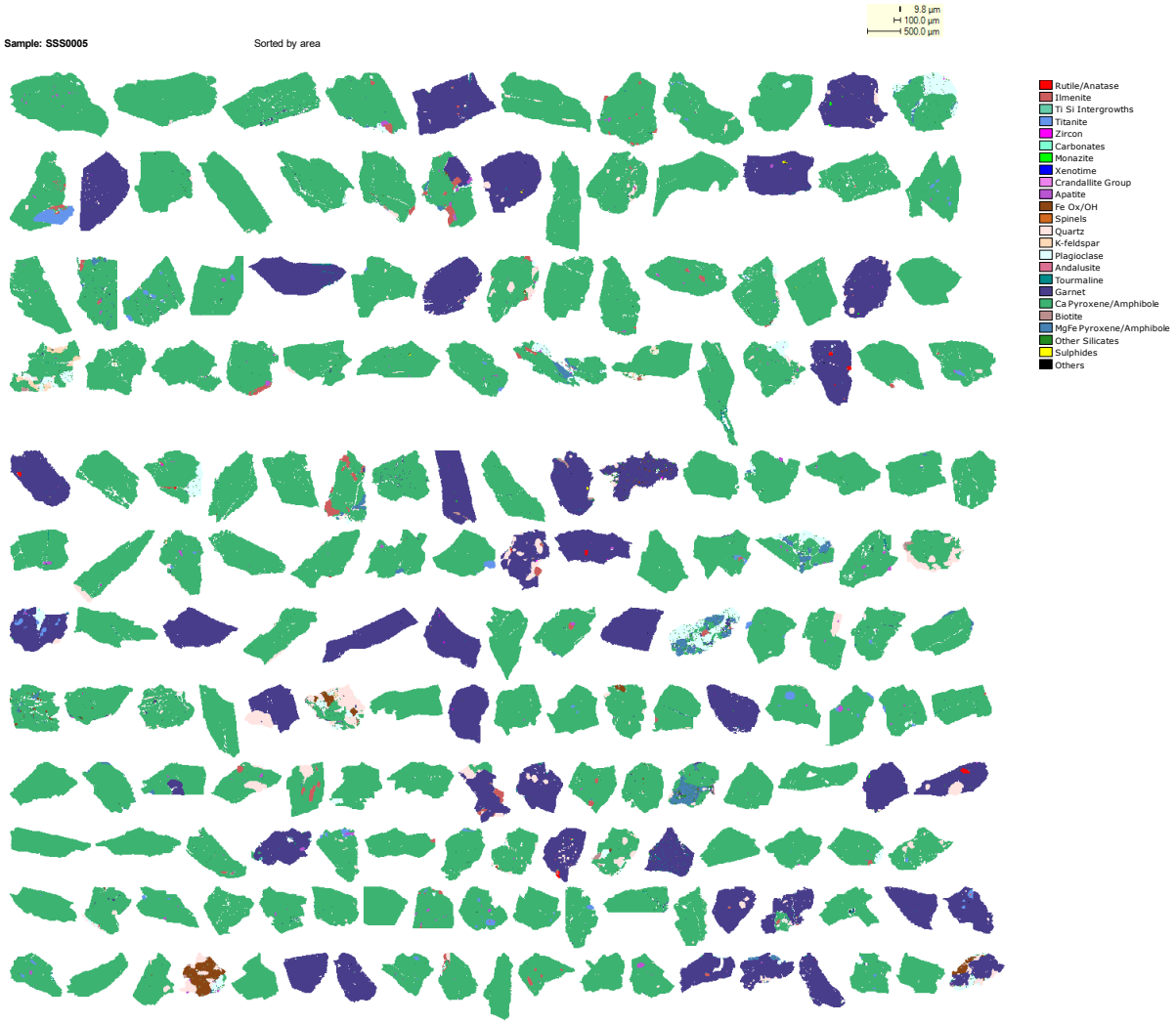
Sample SSS0002



Sample SSS0003



Sample SSS0004



Sample SSS0005

Appendix 3. XRD Information

Mineral List

Mineral	Composition	Comments
Rutile group	$M^{4+}O_2$	Rutile group: Where M^{4+} = Ge, Mn, Pb, Si, Sn, Te, Ti. Rutile was used in these QXRD refinements.
Ilmenite group	$M^{2+}TiO_3$	Ilmenite group: Where M^{2+}=Fe, Mg, Mn, Zn. Ilmenite was used in these QXRD refinements.
Garnet group	$X_3Y_2(SiO_4)_3$	Garnet group: Where X=Ca, Fe^{2+}, Mg, Mn^{2+}; Y=Al, Cr^{3+}, Fe^{3+}, Mn^{3+}, Si, Ti, V^{3+}, Zr; Si is partly replaced by Al, Fe^{3+}. Almandine and Pyrope were used in these QXRD refinements. A Mixture of 35% Pyrope and 65% Almandine was used for data validation.
Quartz	SiO_2	
Amphibole group	$A_{0-1}B_2Y_5Z_8O_{22}(OH, F, Cl)_2$	Amphibole group: Where A=Ca, Na, K, Pb; B=Ca, Fe^{2+}, Li, Mg, Mn^{2+}, Na; Y=Al, Cr^{3+}, Fe^{2+}, Fe^{3+}, Mg, Mn^{2+}, Ti, Z=Al, Be, Si. Actinolite and Ferrotschermakite were used in these QXRD refinements. A mixture composition of 55%Ferrotschermakite and 45%Actinolite was used for data validation.
Mica group	$XY_{2-3}Z_4O_{10}(OH,F)_2$	Mica group: Where X=Ba, Ca, Cs, (H_3O), K, Na, (NH^4); Y=Al, Cr^{3+}, Fe^{2+}, Fe^{3+}, Li, Mg, Mn^{2+}, Mn^{3+}, V^{3+}, Zn; Z=Al, Be, Fe^{3+}, Si. Biotite was used in these QXRD refinements.
Pyroxene group	ABZ_2O_6	Pyroxene group: Where A=Ca, Fe^{2+}, Li, Mg, Mn^{2+}, Na, Zn; B=Al, Cr^{3+}, Fe^{2+}, Fe^{3+}, Mg, Mn^{2+}, Sc, Ti, V^{3+}; Z=Al, Si. Diopside and Enstatite were used in these QXRD refinements.
Spinel group	AB_2O_4	Spinel group: Where A=Co, Cu, Fe^{2+}, Ge, Mg, Mn^{2+}, Ni, Ti, Zn; B=Al, Cr^{3+}, Fe^{2+}, Fe^{3+}, Mg, Mn^{3+}, Ti, V^{3+}. Magnetite was used in these QXRD refinements.
Calcite	$A^{2+}(CO_3)$	Calcite group: Where A^{2+}=Ca, Cd, Co, Fe, Mg, Mn, Ni, Zn. Chalcopyrite and calcite peaks overlap. Calcite was used in these QXRD refinements.
Fluorite	CaF_2	Fluorite: Bornite and Fluorite peaks overlap. Fluorite was identified using just the main peak, further work is required to confirm the presence of this mineral.
Unassigned peak	Unknown	Due to the lack of other identifying peaks, a number of unidentified peaks/phases were observed. Further work is required to determine the mineral giving rise to this peak. Tr = Trace. i.e. the mineral that gives rise to this peak is assumed to be present in trace amounts.

Issues affecting QXRD analyses

There were a number of issues with the QXRD analysis, these should be considered when using the data.

(i) A number of peak overlaps were observed, these have been defined in the mineral list tab but are not limited to these overlaps. The peak overlaps cause issues defining and quantifying minerals within the samples.

(ii) Due to the lack of other identifying peaks, trace amounts of unknown peaks were observed in a number of samples.

(iii) It was observed that a number of samples had variability in data validation, this could be attributed to a composition change in solid solution minerals or linked to samples with high amorphous. Further work is required to confirm the reason for the variability in data validation.

(iv) Please also refer to the Appendix 4 Minerals List tab for other minor issues.

QXRD Procedure

A sub sample was taken from the provided sample(s) and micro milled with ethanol as the grinding liquid. The resultant sample(s) was dried at 60 degrees and lightly pressed into a back-packed sample holder. The XRD trace(s) was collected under the following instrument conditions.

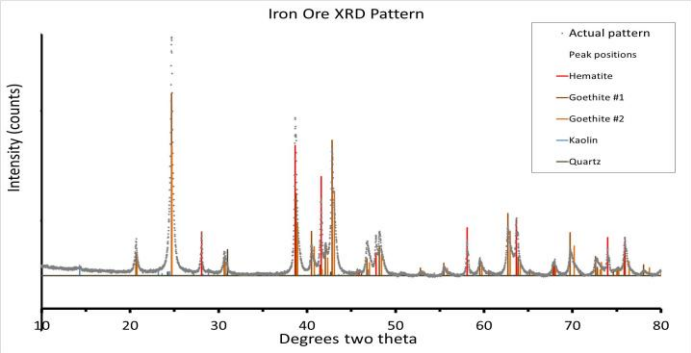
XRD generator	PANalytical X'Pert Pro PW3040 diffractometer, 40 kW, 40 mA
Filter	Iron
Radiation	CoKα (λ = 1.789Å)
Angular range	5° to 80° 2θ
Angular speed	0.095° 2θ/second
Time per step	105.825
Step size	0.039°
Divergence Slit	¼°
Anti-scatter Slit	½°
Spinning	2 seconds per revolution

Mineral identification was undertaken using the X'Pert HighScore Plus search/match software. Rietveld quantitative analysis was performed on the XRD data using the commercial package Highscore Plus v4.9.

X-ray diffraction overview (Not client specific)

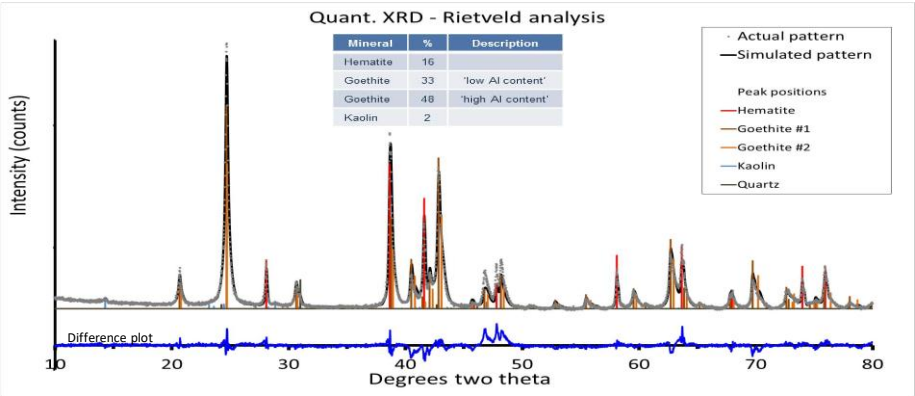
Powder X-ray diffraction is a non-destructive method for determining mineralogy. The X-rays interact with the atoms in the crystalline phases in a sample. This occurs through a process called 'diffraction', where the X-rays interact with the regular array of atoms that are present in crystalline materials. This can generate a 'diffraction pattern', as shown below for an iron ore sample. The peaks in this pattern indicate the presence of hematite, goethite and minor kaolin.

Note that conventional X-ray diffraction is generally insensitive to poorly-crystalline materials, since these do not have the regular array of atoms that are required for X-ray diffraction.



Rietveld analysis

Rietveld analysis can be used to quantify the mineralogy of a sample. It does this by 'simulating' the diffraction pattern from the known crystal structures of the minerals and by varying parameters such as mineral abundance and 'crystal properties' to obtain a good fit between the observed and calculated pattern. The results from a Rietveld refinement are shown below. Note than in this refinement, two goethite models were included - it is more usual for one to be present.



There are a number of factors that can affect the quality of the XRD analyses. These include: (i) sample preparation (ii) the presence of poorly crystalline phases, (iii) the presence of minerals for which there is no crystal structure in the Rietveld database and (iv) the use of inappropriate crystal structures for a given mineral (Bureau Veritas use the standard ICSD database of crystal structures to estimate mineral abundances). XRD analyses may also be less accurate if there are a significant number of overlapping peaks from various phases.

A high degree of uncertainty exists when determining trace minerals (<5 wt.%) by XRD. This is due to the relatively high background noise which tends to obscure minor peaks, which are required for a positive identification of a particular mineral. Crystalline analysis only quantifies the identified crystalline minerals and not amorphous material, unknown minerals or known minerals for which there is not a suitable crystal structure in the database.

Appendix 4. QEMSCAN and XRD Data Validation

QEMSCAN Data Validation

QEMSCAN generates assays for each sample by assigning each pixel analysed a composition and S.G. Chemical assays are compared to the QEMSCAN generated assays to determine if the analysis is valid. Chemical assays can only validate PMA measurements, assays cannot validate SMS measurements for trace elements. In a SMS measurement only a sub population of the whole sample is measured. The sub population mass relative to the whole sample cannot be determined.

Generally there is good correlation between the QEMSCAN generated assays and the chemical assays (XRD). Discrepancies in the Fe values are likely the result of uncertainties in the silicate compositions, particularly for garnet and pyroxene/amphibole.

Data Validation

Sample ID		SSS0001	SSS0002	SSS0003	SSS0004	SSS0005
Al	QEMSCAN	6.0	5.9	6.6	6.7	6.4
	Assay	6.8	6.7	7.3	7.4	7.1
Ca	QEMSCAN	7.2	7.1	6.6	6.3	6.9
	Assay	6.7	6.9	6.1	5.9	6.4
Ce	QEMSCAN	0.0	0.0	0.0	0.0	0.0
	Assay	0.0	0.0	0.0	0.0	0.0
Fe	QEMSCAN	18.2	18.6	19.6	20.4	19.1
	Assay	14.5	13.9	15.7	16.2	14.8
Mg	QEMSCAN	5.9	6.0	5.2	4.7	5.4
	Assay	5.6	5.8	5.3	5.2	5.5
P	QEMSCAN	0.0	0.0	0.0	0.1	0.0
	Assay	0.1	0.0	0.0	0.1	0.0
Si	QEMSCAN	20.5	20.2	19.7	19.2	19.9
	Assay	20.4	20.8	20.0	19.7	20.2
Ti	QEMSCAN	0.4	0.6	0.5	0.6	0.5
	Assay	1.2	1.1	1.2	1.2	1.1
Zr	QEMSCAN	0.0	0.0	0.0	0.0	0.0
	Assay	0.0	0.0	0.0	0.0	0.0

Particle Size Comparison

A comparison between the Physical Particle Size and QEMSCAN estimated Particle P80 has been presented. Particle size data is compared to the QEMSCAN generated estimated Particle P80 to determine if the QEMSCAN analysis is valid. QEMSCAN may be under-estimating the particle size due to the limitations with obtaining cross-sections through the middle of particles. Please refer to the Size Distribution tab for further information.

Please note particle size data was not provided and as such the results are unvalidated.

Sample ID	SSS0001	SSS0002	SSS0003	SSS0004	SSS0005
Physical Particle Size (µm)	NA	NA	NA	NA	NA
QEMSCAN Est. Particle P80 (µm)	685	709	701	744	756

NA - not available / not provided

Particle/Mineral Statistics

The statistics have been provided to highlight the detected number of particles and minerals.

Sample ID	SSS0001	SSS0002	SSS0003	SSS0004	SSS0005
Check - Sample Name	SSS0001	SSS0002	SSS0003	SSS0004	SSS0005
Total Particles Found	2135	1925	1499	1787	1882
Garnet	669	601	599	780	849
Ca Pyroxene/Amphibole	1355	1251	851	974	1182
REE Minerals	6	6	7	11	13
Apatite	133	136	104	135	215
Silicates	2040	1817	1442	1708	1833

iDiscover pre-processes

SIP	**HMS_Z v3.6**
Measurement	**PMA**
Field Stitch	**Y**
Particulator	**Y**
Touching Parting Particles	**Y**
Size	**>15**
BPP	**Y**

XRD Assay Reconciliation

The QXRD data were validated by comparing the chemical assay data with that inferred from the QXRD data. Generally, there is a variable correlation between elemental assay and XRD calculated assay. Some reasons for the variations may arise from, but not limited to;

Sample preparation and representivity
Accuracy of the assay results
The fit of the simulated pattern to the observed pattern and the accuracy of the crystal structures used to simulate the pattern.
Amorphous material
Compositional variations, elemental substitutions in the identified minerals

Element	Method	SSS0001	SSS0002	SSS0003	SSS0004	SSS0005
TiO2	XRD	0.84	0.49	0.98	0.73	0.66
	Assay	1.93	1.84	1.96	2.08	1.82
Fe2O3	XRD	19.70	19.85	22.71	22.45	20.37
	Assay	20.80	19.90	22.40	23.20	21.20
Cr2O3	XRD	ND	ND	ND	ND	ND
	Assay	0.04	0.04	0.04	0.04	0.04
SiO2	XRD	45.82	46.90	44.80	44.72	45.82
	Assay	43.70	44.40	42.80	42.20	43.30
Al2O3	XRD	14.37	13.91	15.10	15.49	14.94
	Assay	12.80	12.60	13.80	14.00	13.40
MgO	XRD	9.77	8.95	9.00	9.60	9.74
	Assay	9.36	9.56	8.78	8.61	9.19
MnO	XRD	0.05	0.05	0.04	0.04	0.05
	Assay	0.57	0.52	0.68	0.73	0.62
ZrO2	XRD	ND	ND	ND	ND	ND
	Assay	0.03	0.02	0.02	0.03	0.02
P2O5	XRD	ND	ND	ND	ND	ND
	Assay	0.12	0.11	0.11	0.12	0.10
V2O5	XRD	ND	ND	ND	ND	ND
	Assay	0.06	0.07	0.06	0.06	0.06
SO3	XRD	ND	ND	ND	ND	ND
	Assay	0.09	0.01	0.01	0.05	0.02
CaO	XRD	9.29	9.76	7.90	7.58	8.60
	Assay	9.37	9.59	8.54	8.27	8.95

XRD and QEMSCAN Mineral Abundance Comparison

Overall, there is a varied correlation between the XRD and QEMSCAN results. Some differences are noted and may arise from a number of reasons;

The two techniques characterise the samples using different properties of the samples; the XRD uses crystal structure whereas QEMSCAN uses micro chemical composition to define mineralogy. Both methods have inherent limitations, the overall effect of these limitations is sample dependent.

Compositionally similar silicate minerals, varying compositions (solid solutions elements) and, on occasion, texturally fine material make it very difficult for the QEMSCAN to accurately differentiate and quantify the silicate mineralogy. On the other hand, phases with solid solutions elements and trace elements less than 1-3 wt.% are poorly defined or not accounted for in the XRD. It is also problematic defining a particular mineral (Almandine, Augite, Riebeckite etc.) from a mineral group (Garnet, Pyroxene, Amphibole etc.) in XRD. If it was possible for XRD to define particular minerals it may have helped with the QEMSCAN classification but was not the limiting factor.

To say one technique is more correct than the other technique would be incorrect. The techniques provide different information and the similarities and differences should be appreciated as it provide information the samples.

Mass (%)		SSS0001	SSS0002	SSS0003	SSS0004	SSS0005
Garnet	QEMSCAN	23	21	33	36	30
Garnet group	XRD	22	20	32	36	28
Ca & MgFe Pyroxene/Amphibole	QEMSCAN	69	70	60	54	64
Amphibole group + Pyroxene Group	XRD	71	73	60	57	66
Quartz	QEMSCAN	3	2	2	2	2
Quartz	XRD	3	4	3	3	3
Biotite	QEMSCAN	0	0	0	0	0
Mica group	XRD	2	1	1	1	1
Ilmenite	QEMSCAN	1	2	1	1	1
Ilmenite group	XRD	1	1	1	1	1
Fe Ox/OH & Spinels	QEMSCAN	1	2	1	2	1
Spinel group	XRD	1	1	1	1	1

XRD Assay Reconciliation

The QXRD data were validated by comparing the chemical assay data with that inferred from the QXRD data. Generally, there is a variable correlation between elemental assay and XRD calculated assay. Some reasons for the variations may arise from, but not limited to;

Sample preparation and representivity
Accuracy of the assay results
The fit of the simulated pattern to the observed pattern and the accuracy of the crystal structures used to simulate the pattern.
Amorphous material
Compositional variations, elemental substitutions in the identified minerals

Element	Method	MTF151 #1	MTF151 #2	MTF151 #3	MTF151 #4	MTF151 #5
TiO2	XRD	0.84	0.49	0.98	0.73	0.66
	Assay	1.93	1.84	1.96	2.08	1.82
Fe2O3	XRD	19.70	19.85	22.71	22.45	20.37
	Assay	20.80	19.90	22.40	23.20	21.20
Cr2O3	XRD	ND	ND	ND	ND	ND
	Assay	0.04	0.04	0.04	0.04	0.04
SiO2	XRD	45.82	46.90	44.80	44.72	45.82
	Assay	43.70	44.40	42.80	42.20	43.30
Al2O3	XRD	14.37	13.91	15.10	15.49	14.94
	Assay	12.80	12.60	13.80	14.00	13.40
MgO	XRD	9.77	8.95	9.00	9.60	9.74
	Assay	9.36	9.56	8.78	8.61	9.19
MnO	XRD	0.05	0.05	0.04	0.04	0.05
	Assay	0.57	0.52	0.68	0.73	0.62
ZrO2	XRD	ND	ND	ND	ND	ND
	Assay	0.03	0.02	0.02	0.03	0.02
P2O5	XRD	ND	ND	ND	ND	ND
	Assay	0.12	0.11	0.11	0.12	0.10
V2O5	XRD	ND	ND	ND	ND	ND
	Assay	0.06	0.07	0.06	0.06	0.06
SO3	XRD	ND	ND	ND	ND	ND
	Assay	0.09	0.01	0.01	0.05	0.02
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Quartz	QEMSCAN	3	2	2	2	2
Quartz	XRD	3	4	3	3	3
Biotite	QEMSCAN	0	0	0	0	0
Mica group	XRD	2	1	1	1	1
Ilmenite	QEMSCAN	1	2	1	1	1
Ilmenite group	XRD	1	1	1	1	1
Fe Ox/OH & Spinels	QEMSCAN	1	2	1	2	1
Spinel group	XRD	1	1	1	1	1

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Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

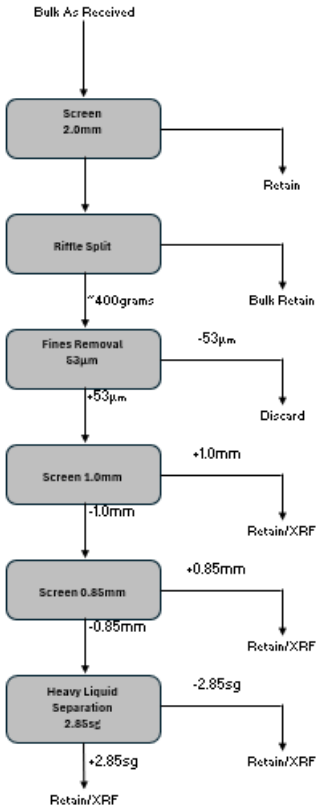
Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *Aspects of the determination of mineralisation that are Material to the Public Report.* • *In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where*	• Five 20kg bulk sample samples were collected from single holes at 200m intervals, using a shovel, along a selected stretch of the Clarence River. • Sample sites were selected to allow for sampling of ideal heavy mineral trap sites. Samples collected at each site are considered representative of each specific trap site. • Not enough sampling has been completed to determine if garnet concentrations in the sampled trap sites are representative of the broader Clarence River sands. • The 20kg samples were sent to a commercial laboratory for screening of different size fractions. The sand fraction was subject to dense media gravity separation (2.85 SG) to give a percentage of heavy minerals in each of the samples. • A 15g – 20g subset of the dense media gravity separation for the sand size fraction (2.85 SG) for each sample was submitted for QEMSCAN and XRD analysis.

Criteria	JORC Code explanation	Commentary
	there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	• QEMSCAN sample analysis / preparation: a sub sample is taken from the sample. Graphite is added to the sub sample to aid in separation of the individual particles. The sub sample/graphite mixture is then mounted in an epoxy resin to form block. The block is ground, polished and coated with carbon prior to QEMSCAN analysis. • QEMSCAN assigns each pixel a mineral identity which is based on the SIP library. The SIP library uses X-ray information and sometimes BSE to define each mineral identity. Each mineral identity must have an assigned composition and density. QEMSCAN cannot differentiate between compositionally identical minerals (e.g.; pyrite/marcasite, hematite/maghemite). Mineral phases may be misassigned if there is significant overlap in the mineral composition. In these instances, Quantitative X-ray Diffraction (QXRD) can be used to assist with classifications. Some examples are iron silicates, such as the enstatite-ferrosilite pyroxenes and the cummingtonite-grunerite amphiboles. • When the electron beam hits the surface of a polished block characteristic X-rays and backscatter electrons (BSE) are generated. This combination of BSE information and

Criteria	JORC Code explanation	Commentary
		characteristic X-rays is the basis for QEMSCAN mineral identification. As the information is collected it is automatically classified against a comprehensive reference library of mineral data that typically contains more than 300 entries. This reference library is known as the Species Identification Protocol (SIP) and consists of a series of categories defined by X-ray analytical information namely peaks present, element concentrations and ratios of the element concentrations; plus BSE values. • Particle Mineralogical Analysis (PMA) is a two-dimensional particle mapping technique in which the entire area of each particle is measured. The QEMSCAN differentiates the particles from resin (mounting media) on the basis of backscattered electron value (BSE) of the mounting resin and then begins to map each particle at the specified X-ray acquisition spacing.
Drilling techniques	• *Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).*	• No new drilling is reported.

Criteria	JORC Code explanation	Commentary
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximise sample recovery and ensure representative nature of the samples.* • *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	• No new drilling is reported. • Samples are classified as bulk samples and no selective sampling was undertaken at each sample location.
Logging	• *Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.* • *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.* • *The total length and percentage of the relevant intersections logged.*	• No new drilling is reported. • Geological observations were recorded for each trap site including visual coarse-grained garnet estimates and nature of the trap site.
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.* • *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.* • *For all sample types, the nature, quality and appropriateness of the sample preparation technique.*	• No new drilling is reported. • Sample representivity was ensured by collecting 20kg bulk samples. • Samples were dried at 80-100°C, weighed and screened at 2.0mm, then riffle split to produce an ~ 400gram sample for characterisation. Characterisation of the 400gram sample included, washing at 53micron to determine the level of

Criteria	JORC Code explanation	Commentary
	• *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.* • *Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.* • *Whether sample sizes are appropriate to the grain size of the material being sampled.*	fines, screening at 1.0mm and 850micron to determine oversize and heavy liquid separation to determine heavy mineral @ 2.85 SG (see flow diagram below). • Sample sizes are considered appropriate for bulk physical characterization studies. • No field QAQC procedures were adopted. • No sub-sampling was undertaken for dense media gravity separation. A 15g – 20g sub-sample of the 2.85 SG dense media separate was submitted for QEMSCAN and XRD analysis.

Criteria	JORC Code explanation	Commentary
		
Quality of assay data and	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.*	• Subset samples (15g – 20g) of the sand sized dense media separates (2.85 SG) were submitted by Litchfield to Bureau Veritas Adelaide for analysis by a scanning electron microscope – referred to as a QEMSCAN. [NB: QEMSCAN is

Criteria	JORC Code explanation	Commentary
laboratory tests	• *For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.* • *Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.*	a standard analytical method for providing quantitative analysis of minerals submitted for analysis. QEMSCAN is an abbreviation of Quantitative Evaluation of Minerals by SCANning electron microscopy.). QEMSCAN generates mineral assemblage maps of the surface of all the particles being analysed. The information gained includes (but not limited to), grain and bulk mineralogy, particle grain size, particle shape, and particle composition in the case of agglomerated minerals.
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.* • *The use of twinned holes.* • *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* • *Discuss any adjustment to assay data.*	• No new drilling reported. • See Appendix 4 for QEMSCAN / XRD QAQC.
Location of data points	• *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.* • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	• A Garmin Handheld 66 series GPS was used to locate sample sites with ±3m accuracy in X, Y, Z. • Co-ordinates are in GDA94 datum, Zone 53.

Criteria	JORC Code explanation	Commentary
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.* • *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.* • *Whether sample compositing has been applied.*	• Bulk samples were collected on a 200m spacing along the Clarence River. • Grade distribution within the Clarence River is variable and not enough information is available to determine if a 200m sample spacing is sufficient to establish the degree of grade continuity appropriate for Mineral Resource estimation procedures.
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.* • *If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.*	• Samples were collected parallel to the downstream direction of the Clarence River. • Lateral sampling across the Clarence River alluvial plain has not been completed and therefore no information on any potential bias with the sampling is available.
Sample security	• *The measures taken to ensure sample security.*	• Samples were transported directly from the Oonagalabi project to RZ Resources in Brisbane in individual polyweave bags secured with zip ties.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• QEMSCAN generates assays for each sample by assigning each pixel analysed a composition and SG. Chemical assays

Criteria	JORC Code explanation	Commentary
		are compared to the QEMSCAN generated assays to determine if the analysis is valid. Chemical assays can only validate PMA measurements, assays cannot validate SMS measurements for trace elements. In a SMS measurement only a sub population of the whole sample is measured. The sub-population mass relative to the whole sample cannot be determined. • Generally, there is good correlation between the QEMSCAN generated assays and the chemical assays (XRD). Discrepancies in the Fe values are likely the result of uncertainties in the silicate compositions, particularly for garnet and pyroxene/amphibole.

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Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.* • *The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.*	• Tenement includes Oonagalabi (EL32279) for a total of 145.3km^2 and 46 sub-blocks. • EL32279 is owned by Kalk Exploration Pty. Ltd., a 100% owned entity of Litchfield Minerals Limited. The tenement is located approximately 125km northeast of Alice Springs on pastoral leases. • The tenement is in good standing and there are no known impediments.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• A summary of previous EL32279 exploration and mining is presented below: • Oonagalabi was discovered in the 1930's.

Criteria	JORC Code explanation	Commentary
		• In 1970, Russgar Minerals completed regional mag-rad survey, VLF_EM survey, ground magnetic survey, single line resistivity traverse and 14 drillholes. • In 1971, Geopeko completed limited IP. • 1979, Amoco completed photo-interpretation, rock chip sampling and drilling (8 holes). • 1981 D'Dor Mining NL completed limited dipole-dipole IP. • Between 1990 – 1996 on EL 6940 Clarence River Finance Group explored for garnet in the Florence and Maud Creeks, collecting 15 samples that averaged 4.4% garnet • Between 1997 – 2000 on EL 9420 Clarence River Finance Group completed garnet exploration north of Oonagalabi EL32279. In 2007, ML 22624 was applied for to cover the central Oonagalabi deposit and surrounding proximal alluvial systems (outside 2025 bulk sampling area). No work was completed and the ML was relinquished in 2019. • Silex 2009 completed pole-dipole IP 1 x diamond hole.

Criteria	JORC Code explanation	Commentary
Geology	• *Deposit type, geological setting and style of mineralisation.*	• Heavy mineral sand mineralisation is present within active alluvial drainages and associated overbank deposits. The bulk of the heavy minerals are thought to be sourced from erosion of the Mt Riddock Amphibolite (and equivalents), a package of sedimentary and igneous intrusive rocks within the Harts Range, NT, that have undergone multi-phased deformation and metamorphism.

Drill hole Information	• *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:*
	  ○ *easting and northing of the drill hole collar*
	  ○ *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar*
	  ○ *dip and azimuth of the hole*
	  ○ *down hole length and interception depth*
	  ○ *hole length.*
	• *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.*
		• No new drilling reported.

Criteria	JORC Code explanation	Commentary
Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.* • *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.* • *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	• No aggregation methods were used during bulk sampling.
Relationship between mineralisation widths and intercept lengths	• *These relationships are particularly important in the reporting of Exploration Results.* • *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.* • *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').*	• No drilling results reported. The bulk samples were collected parallel to the flow direction of the Clarence River.
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a*	• See figures within the main body of the announcement.

Criteria	JORC Code explanation	Commentary
	plan view of drill hole collar locations and appropriate sectional views.	
Balanced reporting	• *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	• All available relevant information is presented.
Other substantive exploration data	• *Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	• See the main body of this report for all pertinent observations and interpretations. Visual garnets reached up to 30% in bulk samples. A magnet was used to confirm that dark minerals were dominantly magnetite. Historical garnet sampling confirms garnet mineralogy as almandine.
Further work	• *The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).* • *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	Future planned exploration includes: • Additional bulk stream sediment sampling. • Geological mapping to assess the potential size of alluvial deposits at Oonagalabi. • Commercial pathways and partnerships.