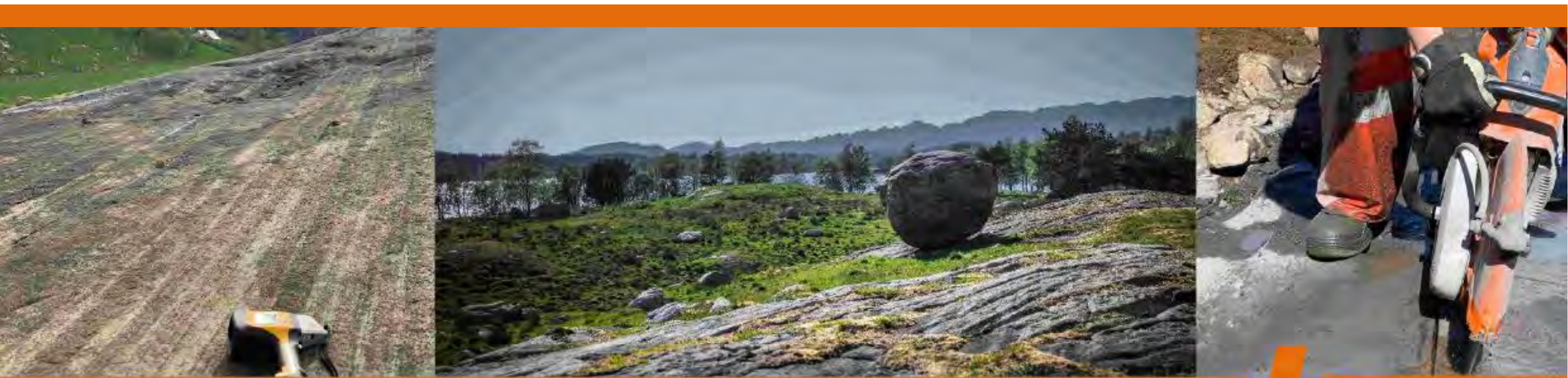
END OF PHASE REPORT, BJERKREIM PHASE 1 EXPLORATION, NORWAY



Prepared for

Norge Mining

Report prepared by

srk exploration

SRK Exploration Services Ltd
ES7821
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Head Office

12 St Andrew's Crescent
Cardiff
CF10 3DD
United Kingdom

UK:	+44	(0) 2920 233 233
Russia:	+7	(0) 4955 454 413
South Africa:	+27	(0) 11 441 1111

Email: enquiries@srkexploration.com Web: www.srkexploration.com

SRK Legal Entity:		SRK Exploration Services Ltd
SRK Registered Address		21 Gold Tops Newport NP20 4PG
SRK Office Address:		12 St Andrew's Crescent Cardiff CF10 3DD
Date:		09/12/2019
Project Number:		ES7821
SRK Project Manager:	Jon Russill	Principal Exploration Geologist
Client Legal Entity:		Norge Mining PLC
Client Address:		The Annex, The Gables, Potters Green, Hertfordshire, SG12 OJU United Kingdom

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END OF PHASE REPORT, BJERKREIM PHASE 1 EXPLORATION, NORWAY – EXECUTIVE SUMMARY

SRK Exploration Services Ltd ("SRK") has been engaged by Norge Mining PLC ("NMP", hereinafter also referred to as the "Company" or the "Client") to undertake their first phase of mineral exploration on their Bjerkreim Project located in Rogaland County, southern Norway. This work took place between April and June 2019.

The Bjerkreim project comprises several exploration permits that cover much of the Bjerkreim lobe of the Bjerkreim-Sokndal Layered intrusion ("BSL") which has long been recognised for its potential to host of titanium, vanadium and phosphate (Ti-V-P) mineralisation within certain zones that have substantial lateral continuity. The Norwegian Geological Survey ("NGU") has conducted several phases of exploration and research on the BSL and published their opinions of the mineral potential of the area. These are summarised in a Competent Person's Report ("CPR") authored by SRK on behalf of NMP in late 2018 titled "*COMPETENT PERSON'S REPORT ON THE BØMLO AND BJERKREIM PROJECTS, NORWAY*".

The NGU had defined three igneous stratigraphic sequences between 50 and 150 m wide and from 4 to 12 kilometres long, containing potentially economic concentrations of ilmenite (Ti), apatite (P) and magnetite (Fe and V). These were referred to as mineralised Zones A, B and C..The principal objective of this phase of work was to validate and expand on the results and interpretations of previous exploration and research on the BSL, particularly the locations, grades and continuity of mineralised zones reported by the NGU. The 2019 exploration programme was successful in these respects, whilst highlighting many more opportunities for further work.

SRK used continuous channel sampling across as much of the width of mineralised zones as possible to obtain data that is, to date, the most representative of the in-situ geology and grades of economic mineralisation in the BSL. A total of 21 profiles on three mineralised zones were cut and sampled and the total length of channel sampling was 496 m, resulting in 398 samples. This work concentrated on the central part of the project area, mainly due to the amount of historical data and the opportunity this gave to validate it (as a result, the mineralised Zone A has not been investigated and should be included in any subsequent exploration work). This work also included reconnaissance in the wider area to identify potential extensions of mineralised zones and discover new exploration targets. These include a new mineralised zone, parallel to and of similar dimensions as the previously defined ones, referred to as NEW Zone.

The principal outcomes of the 2019 channel sampling programme are summarised as follows:

- SRK's channel sampling data generally show good agreement to the historical NGU data, meaning that the NGU's geochemical data can be accepted with a reasonable degree of confidence. A key difference is that vanadium grades in the new channel samples are significantly higher than in NGU's grab samples, possibly as a result of differences in analytical methods;
- Of the areas sampled, Zone B has the highest grade potential when incorporating all the elements of interest. Zone C also hosts all elements of interest but at slightly lower grades. The NEW Zone was first sampled during the 2019 exploration programme having not been recognised before; this has the highest Ti grades, but apatite (P) is absent;

- With respect to the across-strike continuity of the mineralised zones (i.e. going up/down through stratigraphy), the channel sample results and field observations, show that grades in both Zone B and NEW Zone can vary considerably. The highest grades are found in rock sequences within the wider parts Zones (between 5 and 100 m wide), leaving considerable gaps locally within the mineralised zones. The width of these zones is also variable, sometimes appearing to pinch out completely but about 60-100 m wide in the main areas of interest;
- Regarding along-strike grade continuity, the reconnaissance work and a new evaluation of the NGU grab sample data has shown that variations exist in the mineralisation. This is especially true within Zone B between Lusiknuten and Terland Farm, with the latter being of lower grade and lacking the typical banding/layering exhibited by Zone B rocks elsewhere and forming a c. 1 km long lower-grade section in the Zone B mineralisation. Furthermore, the chemical characteristics along strike in the zones vary somewhat, but can still be used to discriminate each zone;
- At the area of Lake Teksevatnet, an elevated area seems to have existed in the floor of the magma chamber during the intrusion's emplacement. Onlap of the layers onto this high has caused the stratigraphic sequence to thin and the mineralised zones have become spatially closer. This has important consequences for future economics (pending a mining study and economic analysis), as it may be possible to use a single open pit to mine two zones that are so closely spaced, if it is shown that this is the optimal mining technique;
- The mineralogical study undertaken as part of the wider metallurgical study shows that the predominant ore minerals are ilmenite and magnetite. Ilmenite and apatite are the main source of Ti and P respectively, with magnetite hosting >95% of the V with an average grade of ~0.59% (within magnetite).

Table 1 Summary of channel sample assay data

Channel	Zone	No. Samples	Length (m)	XRF Assay			Model Mineral Composition %			Total Economic Minerals %
				P_2O_5 %	TiO_2 %	V_2O_5 ppm	Apt	Ilm	Mag	
10+11	B	48	58.4	4.14	6.42	1128	10.2	12.8	8.5	31.5
14	B	25	31.6	4.14	6.54	1145	10.3	13.0	8.8	32.0
15	B	23	30.9	4.19	5.72	858	10.5	11.5	7.7	29.7
B		**96**	**120.9**	**4.15**	**6.27**	**1064**	**10.3**	**12.5**	**8.4**	**31.2**
1	C	43	57.8	2.93	4.62	691	7.4	9.3	5.2	21.9
2+3	C	58	63.8	3.45	4.86	737	8.7	9.8	6.5	25.0
20+21	C	44	56.7	3.32	4.93	829	8.3	9.9	6.0	24.2
C		**145**	**178.3**	**3.24**	**4.80**	**751**	**8.1**	**9.7**	**5.9**	**23.7**
4+5+6	NEW	34	44.9	0.11	5.98	781	0.3	12.1	4.4	16.8
7-9+12-13	NEW	43	48.7	0.11	7.17	931	0.3	14.6	5.8	20.7
16	NEW	15	17.1	0.09	5.74	816	0.2	11.5	5.7	17.4
17+18+19	NEW	65	86.3	0.08	6.74	895	0.2	13.6	4.4	18.2
New		**157**	**196.9**	**0.10**	**6.58**	**871**	**0.2**	**13.3**	**4.9**	**18.5**

These assay data are weighted (by length) and averaged per section through individual mineralised zones. Each section can consist of one or several channels. Note that these data vary slightly from previously internally presented results which were unweighted averages (in the preliminary result presentation of August 2019). Modal mineral compositions are calculated in the same way as the NGU calculations (Schiellerup et al., 2001) and are thus comparable. XRF assay results are by ALS Laboratories method ME-XRF21n.

Regarding the outcomes of reconnaissance work and a re-interpretation of the historical data, the following points are highlighted:

- This work has resulted in extensions of the known mineralised zones, as compared to NGU's mapping. This includes extensions of the zones into the southern limb of the intrusion. The current interpretation and the degree of confidence in this interpretation is shown in Figure 1;
- The principal change from NGU's interpretation is that instead of only Zone C being present east of Lake Teksevatnet in NGU's interpretation, three mineralised zones have now been recognised. This means that, potentially, the combined extent of the mineralisation has substantially increased in this area, and the recognition that Zone B persists to the east of Teksevatnet may be particularly important. Preliminary interpretations of the newly-acquired aeromagnetic data suggest that some adjustments need to be made to SRK's model in the area between Lakes Teksevatnet and Bilstadvatnet, but the general conclusion that all three mineralised zones continue here is still valid;
- Outside the levels of the stratigraphy that host the known mineralisation, there are several other areas that could potentially host Ti-V-P mineralisation of interest, mainly located in the southern part of the Bjerkreim lobe at stratigraphically higher levels, closer to the core of the intrusion. In addition to these, again in the southern area, SRK has identified occurrences of different types of mineralisation including massive magnetite and massive ilmenite. These occur in a different style and appear not to conform to the general stratigraphy.

In conclusion, SRK considers this phase of work to have been a success in terms of validating and improving on historical data and the understanding of mineralisation in the Bjerkreim project area. It is encouraging that the area's mineral potential could be greater than that proposed by the NGU, notwithstanding the fact that this relates to *geological potential* which will always be substantially higher than that which can be developed as Mineral Resources.

Based on the outcomes of this work as well as ongoing modelling and interpretation of geophysical data, SRK has recommended further mapping and reconnaissance work in areas of newly identified potential as well as diamond drilling to develop some of the main areas of interest towards Mineral Resource estimation. The priority area for drilling is Øygrei (west of Lake Teksevatnet) where Zones B, C and NEW can be drilled at a spacing sufficient for a possible Mineral Resource Estimate. More widely spaced 'scout drilling' can be conducted on new targets in the southern area.

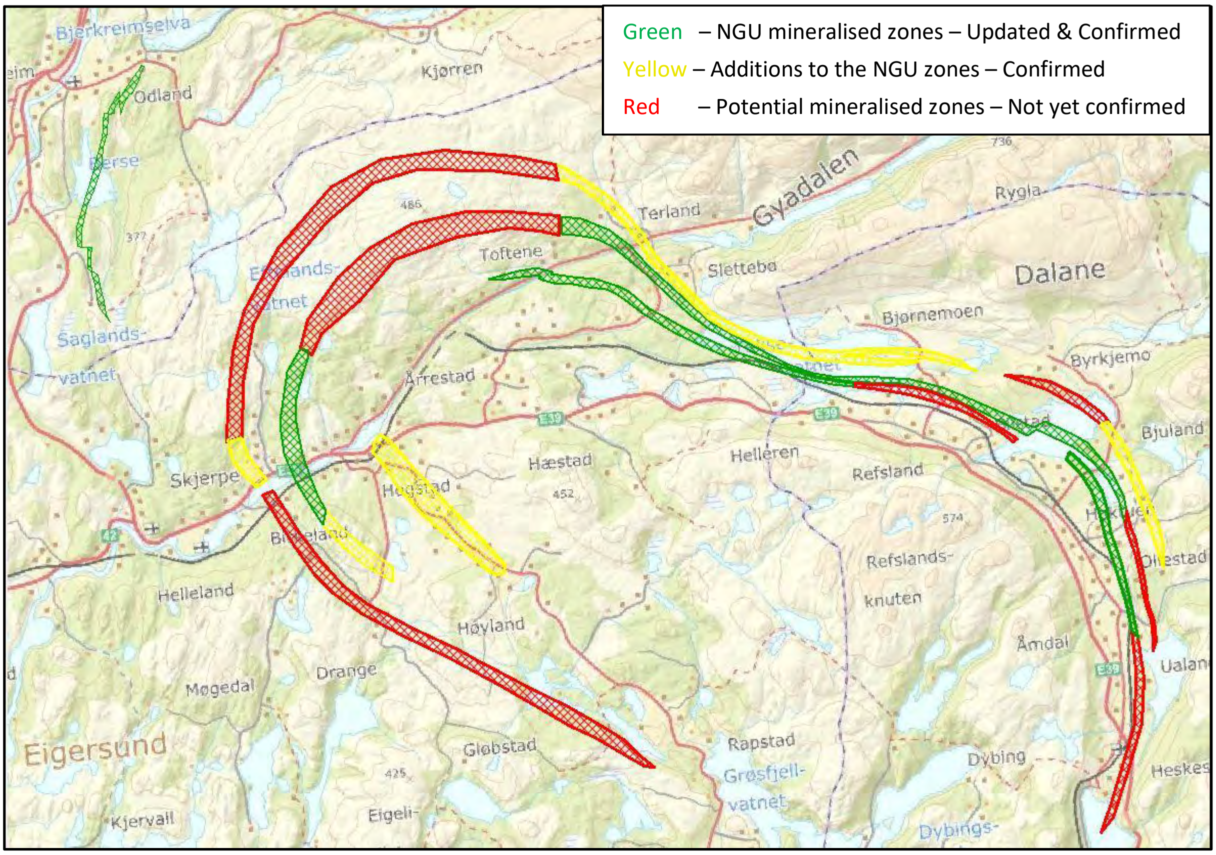

Figure 1 A new model for the extent of the mineralised zones and the degree of confidence in the interpretation of them

Additional mineralised zones, or extensions of known ones in yellow are based on reconnaissance fieldwork and re-interpretation of NGU sample analyses. Potential areas of interest (red) are either poorly exposed, locally do not reach surface or not yet ground-checked. They are largely based on aeromagnetic data.

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1 INTRODUCTION

1.1 Background

SRK Exploration Services Ltd ("SRK") is part of the global SRK Consulting Group (the "SRK Group" or "SRK"). SRK has been requested by Norge Mining PLC ("NMP", hereinafter also referred to as the "Company" or the "Client") to undertake their first phase of mineral exploration on their Bjerkreim Project ("Bjerkreim", also referred to as "the Project") located in Rogaland County, southern Norway.

The Bjerkreim project comprises several exploration permits (Figure 1-1) that cover much of the Bjerkreim lobe of the Bjerkreim-Sokndal Layered intrusion ("BSL") which has long been recognised for its potential to host of titanium, vanadium and phosphate (Ti-V-P) mineralisation within certain zones that have substantial lateral continuity. The Norwegian Geological Survey ("NGU") has conducted several phases of exploration and research on the BSL and published their opinions of the mineral potential of the area. These are summarised in a Competent Person's Report ("CPR") authored by SRK on behalf of NMP in late 2018 titled "*COMPETENT PERSON'S REPORT ON THE BØMLO AND BJERKREIM PROJECTS, NORWAY*", (SRK 2018).

The phase of work reported herein has addressed some of the recommendations in the CPR, including the use of continuous channel sampling to validate (or otherwise) the locations and grades of particular mineralised areas reported by the NGU. This work also included reconnaissance in the wider area to identify potential extensions of mineralised zones and discover new mineralised zones.

The work detailed by this report was conducted by a team of SRK ES exploration geologists between April and June 2019. This report describes the work completed and attempts to put the associated results into context.

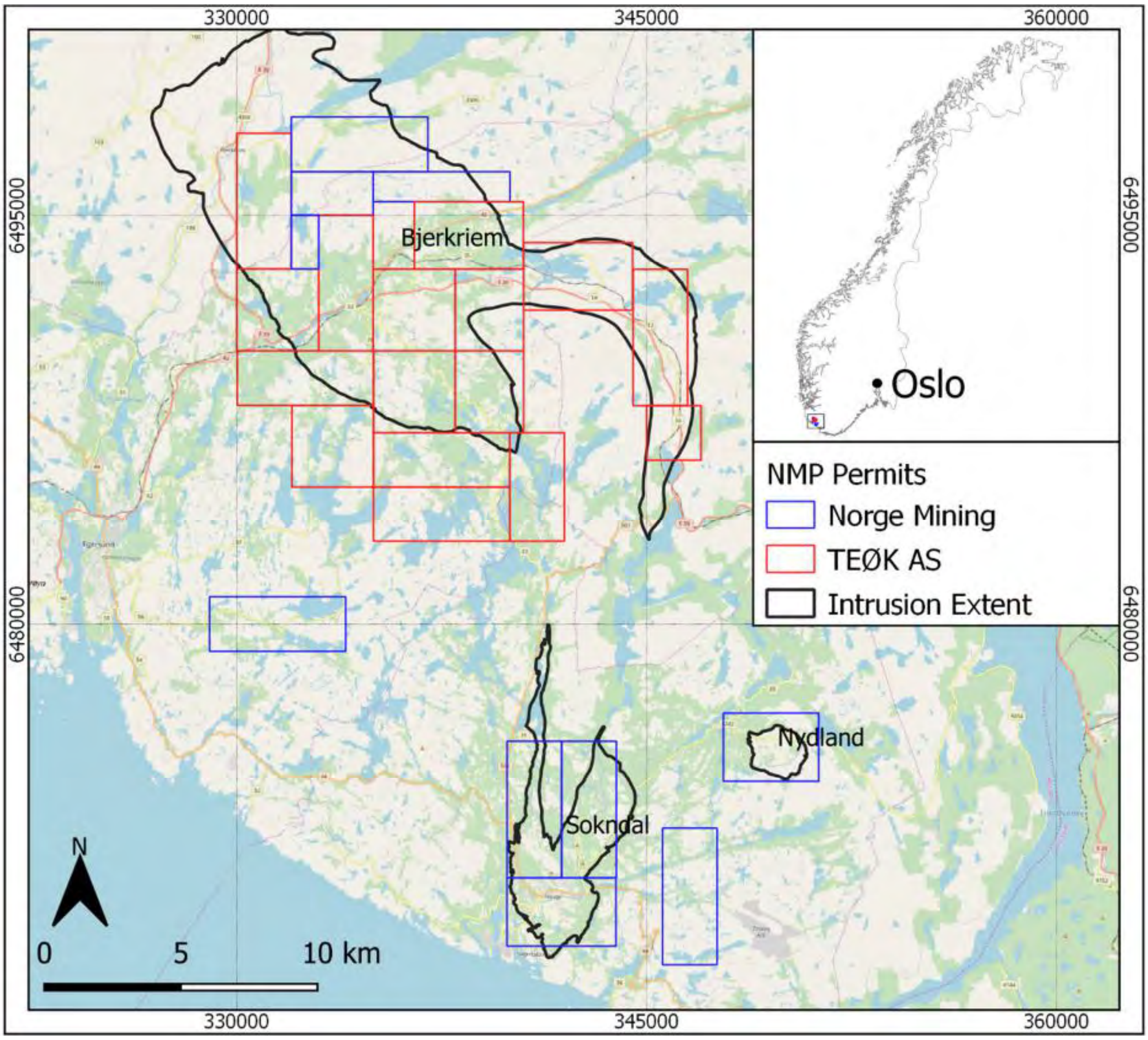


Figure 1-1 Location map of NMP current exploration permits (2019)

1.2 Scope of Work

This report covers parts of the scope of work that was included in SRK's proposal to NMP, P513 dated 01/02/2019 namely:

1. Complete compilation and review of data from historical work;
2. Further processing and interpretation of airborne magnetic and gravity data to refine the lateral extent of known mineralised zones and to improve the understanding of geology at depth;
3. More detailed review of NGU geochemical data to test the potential for extensions or increased thicknesses of known mineralised zones and improve the understanding of ilmenite- and magnetite-dominated mineralisation;
4. Field sampling and reconnaissance in locations dictated by the outcomes of the above steps:
    a. Continuous channel sampling with rock saws across known mineralised zones to test grade continuity and obtain more representative data than that produced by historical rock chip sampling. This will hopefully provide validation of historical geochemical data which is required before committing to a drilling

programme;

b. Trenching and channel- or rock chip sampling, in or adjacent to, areas of known mineralisation to confirm continuity in areas with no exposure of bedrock. This will provide evidence that NGU's assumptions of continuity across such areas were valid or otherwise. Note that this work will require permission from landowners;

c. Channel or rock chip sampling in potential extensions of mineralised zones;

d. Reconnaissance in apparently under-explored areas, for example the southern part of the intrusion, to assess geology and obtain samples. Some of this may take place concurrently to the channel sampling or trenching programme;

5. Use channel sampling to obtain up to three samples of about 100 kg each for preliminary metallurgical test work. This will be used to obtain an early indication that the minerals of interest can be recovered and at what levels, and to indicate any potential for future opportunities or risks in mineral processing. A laboratory in the UK has been contacted to provide an approach and price for this work and have suggested the following:

   a. Crushing and grinding to a range of sizes;

   b. Mineralogical analysis (e.g. QEMSCAN) on sized fractions;

   c. Density profiling and magnetic profiling by size range;

   d. A programme of beneficiation testing using a combination of Low and High Magnetic separation, gravity (table) testing with flotation of apatite on the gravity/magnetics tailings products. The test products would be assayed for Fe, TiO_2 V_2O_5 and P_2O_5;

6. Reconnaissance of potential (results-dependent) future drilling locations and assessment of access and logistical requirements.

This report is structured based on the above scope of work. There was originally an intention to conduct a ground magnetic survey, but this was not undertaken. It was considered that the large scale of the project would limit the use and cost-effectiveness of relatively small surveys, and there was willingness on the part of NMP to commission an airborne geophysical survey that would achieve far more comprehensive coverage.

At the time of writing this report the metallurgical and airborne magnetic survey results are still pending and are therefore not included in this report.

1.3 Work Completed

SRK has completed the following work in order to meet the requirements of this commission:

- Acquisition of 398 channel samples from 21 channel sample profiles on three different mineralised zones in the northern part of the Bjerkreim lobe;
- Reconnaissance work in the southern part of the Bjerkreim lobe to identify extensions of known mineralised zones and identification of new areas of potential;
- Modelling of historical airborne geophysical data to improve the geological understanding of the BSL and identify areas of interest;
- Selection of three metallurgical samples from portions of the channel samples for

mineral processing testwork, based on the channel sampling analytical results;

- Continued engagement of local stakeholders to raise awareness of the project and seek their involvement in exploration logistical requirements.

1.4 Qualifications of Consultants

SRK Exploration is part of the international group holding company SRK Consulting (Global) Limited, which comprises over 1,400 professional staff providing expertise in a wide range of exploration, mining and engineering disciplines.

The SRK Group's independence is ensured by the fact that it holds no equity in any project and that its ownership rests solely with its staff. The SRK Group has a demonstrated track record in undertaking independent assessments of Mineral Resources and Ore Reserves, project evaluations and audits, competent person's reports and independent feasibility evaluations on behalf of exploration and mining companies and financial institutions world-wide.

The SRK Group consultants include specialists in the fields of exploration, geology, Mineral Resource / Ore Reserve Estimation and classification, open-pit and underground mining, geotechnical engineering, metallurgical processing, hydrogeology and hydrology, tailings management, infrastructure, environmental management and mining economics.

The SRK personnel that would be involved with the project have extensive experience in the mining and exploration industry and are members in good standing of appropriate professional institutions.

Neither SRK nor any personnel selected by SRK has any beneficial interest in the project. SRK has been paid a fee for its services in accordance with normal professional consulting practice.

2 GEOLOGY

The Bjerkreim project is situated on the large BSL mafic intrusion on the eastern margin of the large Rogaland Anorthosite province (Figure 2-1). The project focusses on the Bjerkreim lobe of the BSL intrusion. NMP has also acquired exploration licences of the southern part of the intrusion, the Sokndal lobe. Where "the intrusion" is mentioned in this report, this refers to the Bjerkreim lobe.

2.1 Magmatic Units, Zones and Layers

A layered intrusion is formed by multiple injections of magma in thin horizontal sheets, or sills, in the earth's crust. These sills build up a sequence of horizontal layers, very much like sedimentary layers. In each sill, the heavy (dark/mafic) cumulate minerals sink to the bottom, shortly after intrusion and create the dark layers that are enriched in magnetite, ilmenite and pyroxenes, which contrast with the lighter (felsic) upper parts of the layers. In this way, the distinct layering is formed and enhanced and creates an inbuilt 'way up' structure (Figure 2-2 and Figure 2-3). The mineralogical composition of the layers, and therefore their economic grade, is controlled by the composition of the intruding magma which changes constantly during the lifetime of the intrusion and shows a progression through fractionation from the earliest to the latest intrusions.

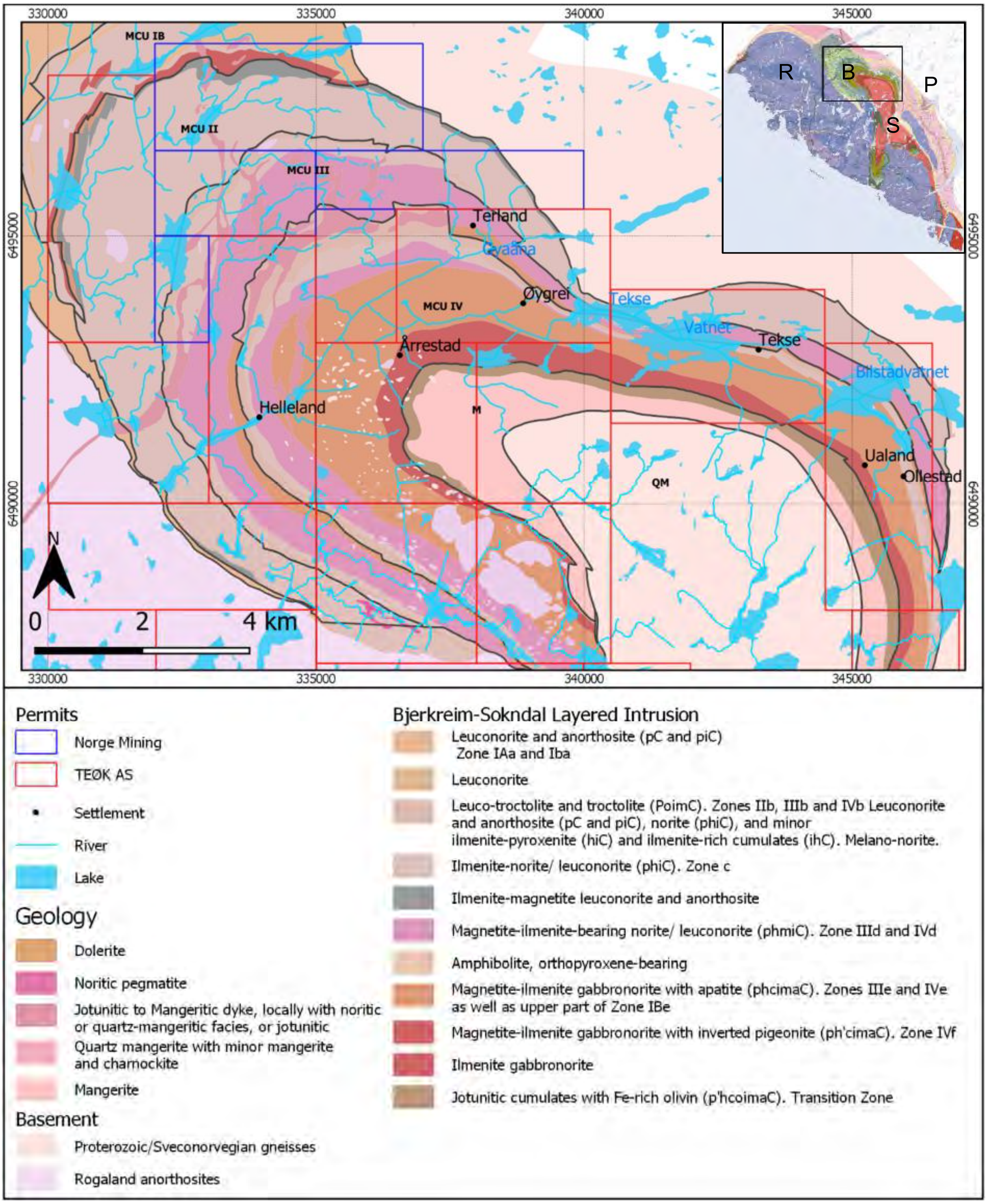


Figure 2-1 Geological map of the Bjerkreim Lobe of the layered intrusion.

Inset map shows the location of the map area in the Rogaland Anorthosite Province (with different colours of the lithological units). In the inset map: B and S are respectively the Bjerkreim and Sokndal Lobes of the layered intrusion. R: Rogaland anorthosite suite, P: Proterozoic gneisses. MCU IB to MCU IV, TZ, M and QM as defined in Figure 2-4.

The magma goes through several compositional cycles as is seen in the stacking of five Mega Cycle Units ("MCU"), the oldest at the bottom, the youngest at the top (Figure 2-4). Up to six different zones occur within each MCU, referred to as zones *a* to *f* (lower case letters), each with a different mineralogical composition. Zone *a* is earliest/lowest and zone *f* is the latest/highest. The lowest zones are more predominant in the lower MCUs that occur in the west and the higher zones are better represented in the higher MCUs in the central and eastern part of the intrusion (Figure 2-5). Each zone contains multiple (tens to hundreds) layers that can be anywhere from a few centimetres to many metres wide. Ilmenite can occur in all of these zones, but magnetite occurs only in zones *d* to *f* and apatite is restricted to zones *e* and *f* (Figure 2-4). Magnetite is the mineral that contains vanadium, ilmenite and apatite are respectively titanium and phosphorous–bearing minerals. It is these three minerals that are the focus of the exploration and they are referred to as the "value" or "target" minerals.

Above MCU IV, the composition of the magma evolved to more felsic compositions, but still include the same minerals as the zones below it, just in lower concentrations of the mafic (including the target) minerals. Adding these units and zones together, the whole sequence of the five MCUs and felsic rocks on top of them is more than 7 km in thickness. It is uncertain, however, whether at any location the layered intrusive body includes all zones has been preserved and reaches this total thickness.

Figure 2-2 Strongly layered rocks at Melhus farm in the north-western part of the BSL.

View to the southeast. Stratigraphy is up to the southwest (to the right in the photo)

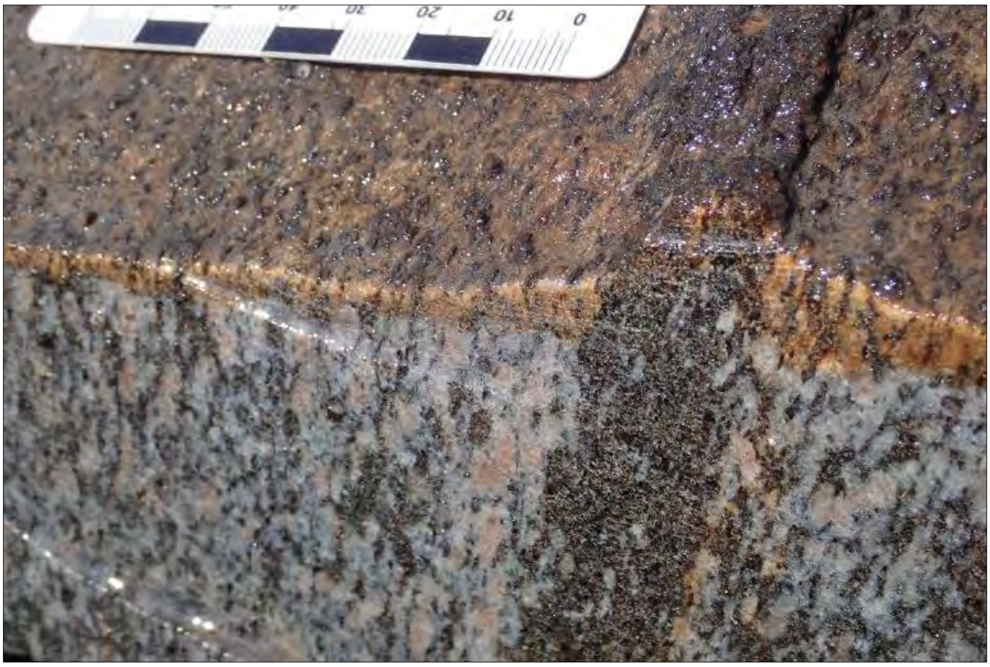


Figure 2-3 Detail of mafic and felsic banding in Zone C at Øygrei

Stratigraphic way up is to the left (south)

2.2 Mineralised zones

NGU defined three mineralised zones, Zone A, Zone B and Zone C, (not to be confused with the lower-case-labelled zones within the MCUs), with their stratigraphic position shown in Figure 2-4 and their spatial position in Figure 2-5. These are based on the occurrence of the three economic minerals ilmenite, apatite and magnetite together, which only occurs in stratigraphic zones *e* and *f*. Zone *e* occurs in MCU IB, MCU III and MCU IV, while zone *f* only occurs in the latter. Mineralisation grades are highest in the earliest phases of intrusion of each MCU, and therefore the defined mineralised zones are the base of each of the zones *e*. Grades decrease higher up in the layered sequence. Each of the mineralised zones is approximately 50 and 100 m wide and can be traced through the intrusion for many kilometres.

NGU defined the mineralised zones as follows:

Zone A - The stratigraphically lowest mineralised unit and also the smallest, stretching over about 4 km but with gaps in exposure where it is crosses lakes.

Zone B - split in two, a slightly curved, western part is 2.6 km long and crosses the river at Helleland. It strikes approximately N-S in the southern part of the hinge zone. The eastern part of Zone B is in the northern fold limb, extending over 4 km of strike, of which the eastern 1.5 km is in Lake Teksevatnet or tracing the southern shore.

Zone C – extends along 12.6 km strike which is intersected by several lakes.

Both Zones B and C are shown to be abruptly truncated in the hinge area of the fold (Figure 2-5). Figure 2-4 and Figure 2-5 also show an additional mineralised zone that was found during this current phase of exploration, named NEW Zone. This mineralised zone is stratigraphically situated within zone *d* of MCU III (i.e. below mineralised Zone B; Figure 2-4). Ti (ilmenite) and V (in magnetite) grades are similar to those for mineralised zones A and B, but phosphorous (apatite) is virtually absent. It is assumed that this zone was not discovered/not reported by NGU because, at the time, their work had a focus on apatite. NEW Zone was discovered close to Melhus Farm, northeast of Zone B, and is discussed in later sections of this report.

Detailed reports on these mineralised zones and the mineral grades can be found in several NGU publications (Schiellerup et al. 2001, Korneliussen et al. 2001, Meyer et al. 2002, Boyd et al 2012 a and b) and are evaluated in the SRK CPR (SRK 2018).

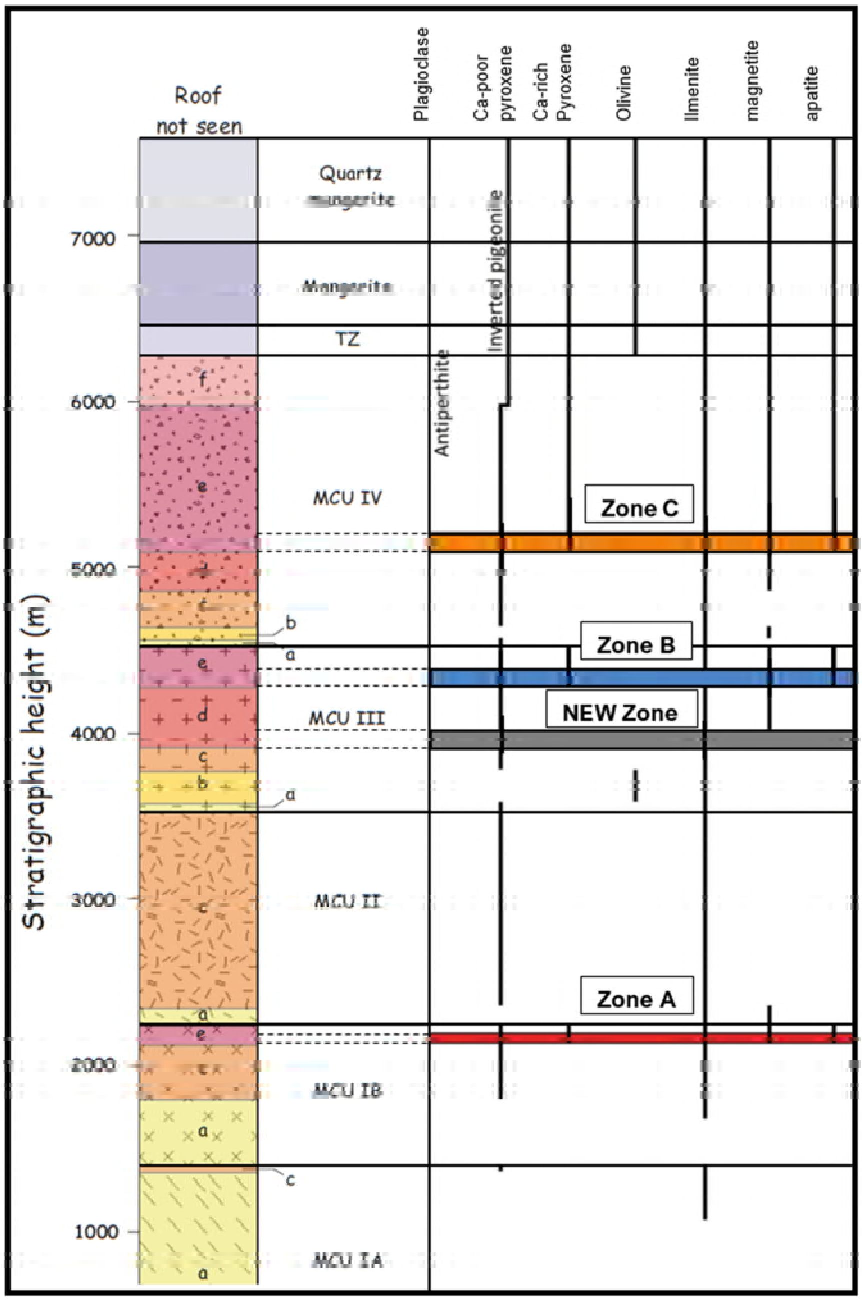


Figure 2-4 Magmatic stratigraphy in the Bjerkreim-lobe of the BS Layered Intrusion

Each of the MCU I to IV includes several of the mineral assemblage zones a to f. Coloured fields indicate the stratigraphic position of the mineralised zones. A, B and C as defined by NGU, NEW Zone is added by SRK.

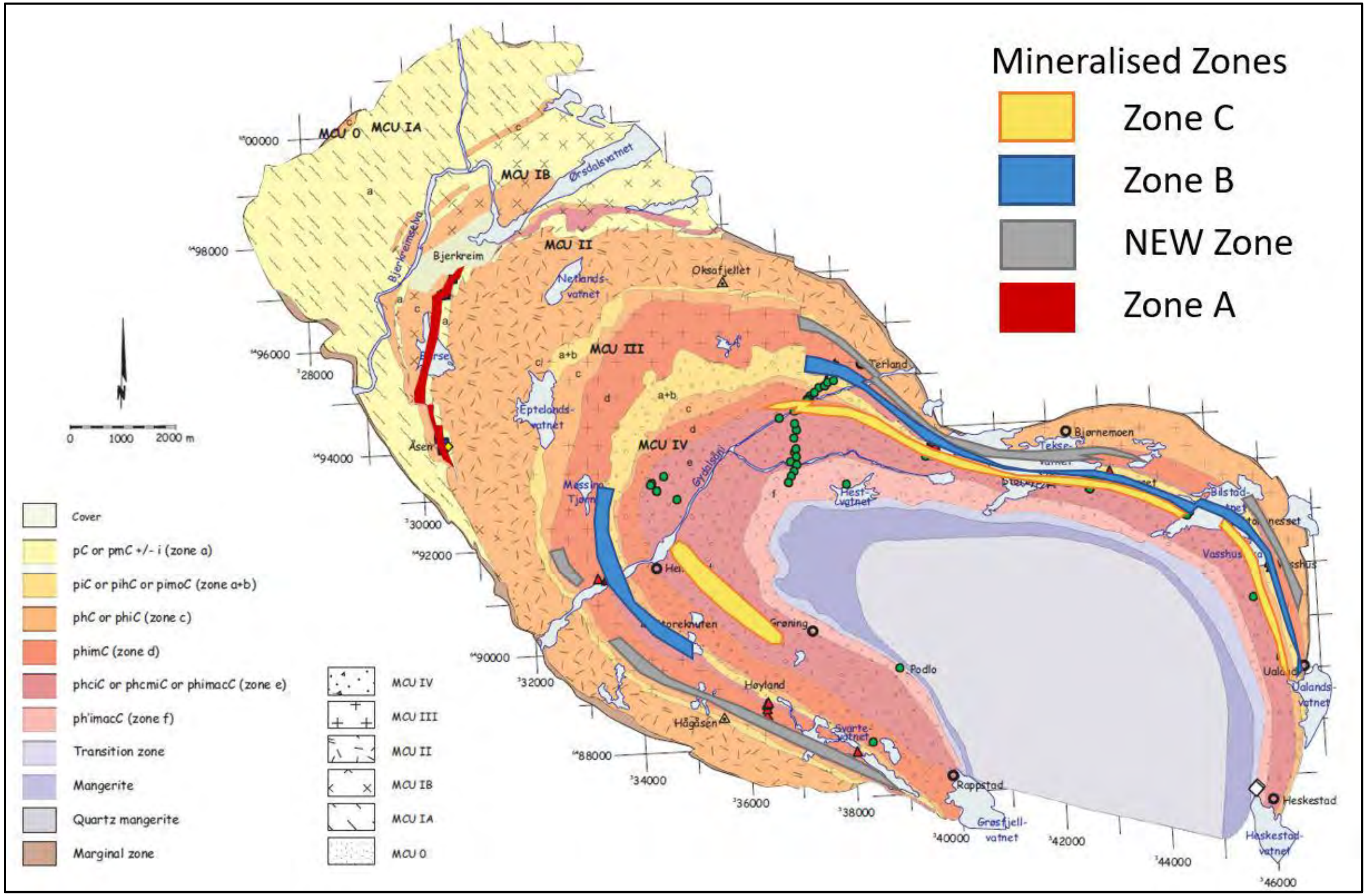


Figure 2-5 Megacycle Unit Map of the Bjerkreim Lobe of the Bjerkreim-Sokndal layered Intrusion – with SRK mineralised zone interpretation

Geological map based on mineral assemblages. Mineralised zones according to SRK definition. Map and coloured symbols indicating sample locations from Schiellerup et al. (2001).

2.3 New Interpretation of the Mineralised Zones

The exploration undertaken by SRK in this phase of work concluded that the NGU's mapping of the mineralised zones was inaccurate in certain locations. SRK has produced a new interpretation of them including a proposal for their lateral extension in some areas. This reinterpretation has increased the combined strike length of the mineralisation by several kilometres over the project area. A comparison between the NGU's and SRK's interpretation of the mineralised zones is shown in Figure 2-6.

Based on fieldwork and review of the chemistry of grab samples collected by NGU, it is clear that the part of Zone B between Lake Teksevatnet and Terland needs to be shifted north by c. 100 m. It is also proposed that Zone B does not terminate within Lake Teksevatnet but continues all the way to the eastern part of the project area. SRK also re-interprets Zone C to be continuous and running parallel to Zone B east of Teksevatnet, but it is poorly exposed until it reaches Olleland.

South of the fold hinge, in the southern part of the area, Zone B extends for at least one more kilometre to the south. North of the river at Helleland it needs to be shifted laterally by c. 100 m to the west.

During SRK's reconnaissance, mineralised rocks were encountered in the southern area, in zone MCU IV-e, that have a similar chemistry as the rocks in Zone C. This suggests that Zone C is continuous, adding at least 1.5 km to its total length.

The lateral shifts of Zone B, as well as a few other minor shifts elsewhere, do not change the overall concept of the mineralisation but need to be understood when planning future drillholes. By contrast, the along-strike extensions of the mineralised zones are more significant in that they may represent new exploration targets that could add considerably to the potential of the area. Further work is required to understand the scale of this potential, and the forthcoming airborne geophysical data will used to further define these zones. The NEW Zone also adds many kilometres to the mineralised zones, but the economic significance of this needs further assessment on account of it being almost devoid of apatite.

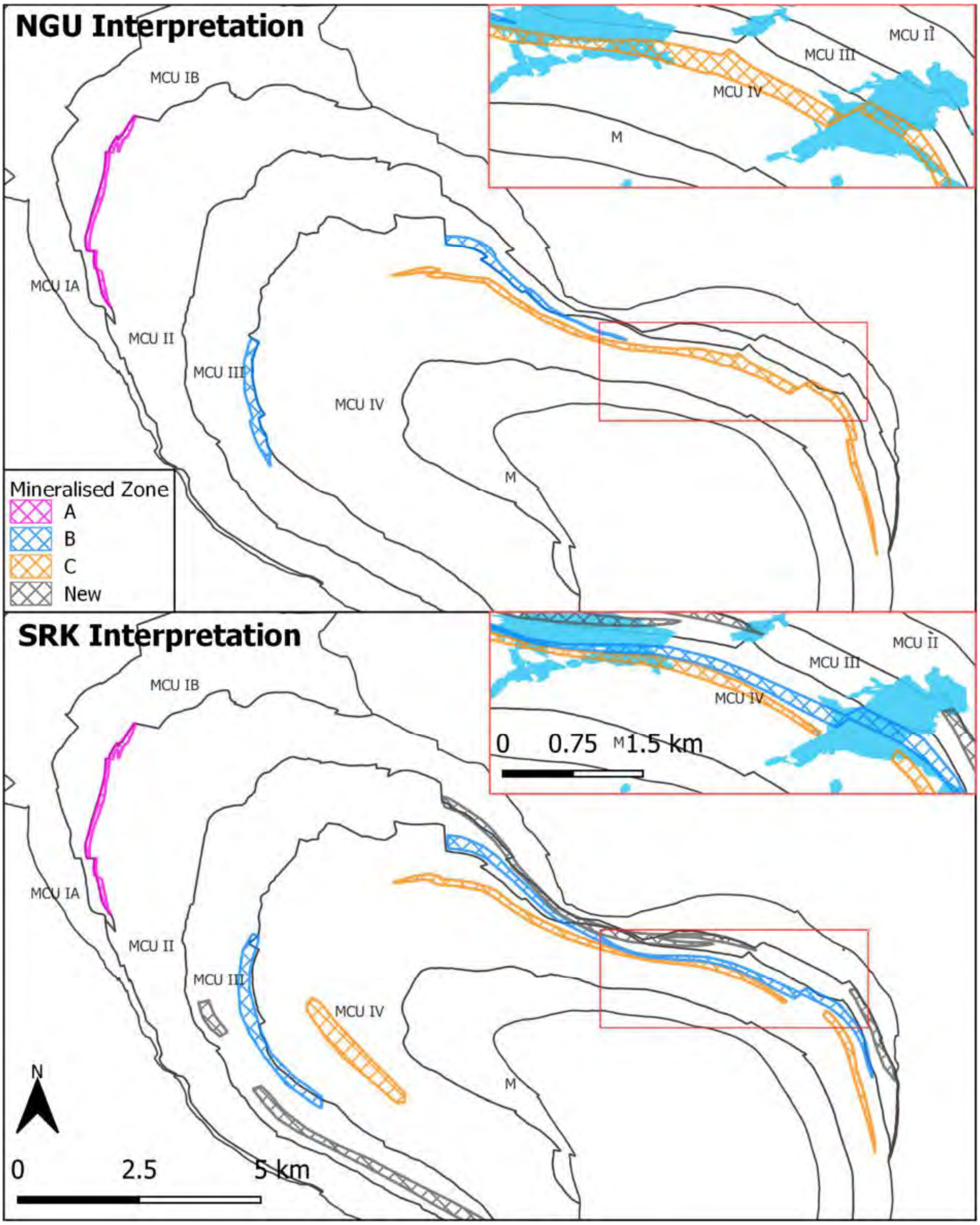


Figure 2-6 Comparison between NGU and SRK mineralised zone interpretation

2.4 Shape of the Bjerkreim Lobe

The layered intrusion was formed largely as a stack of horizontal layers and subsequently deformed into a kilometre-size syncline (trough) that plunges about 35° to the southeast. A sketch of the general shape is shown in Figure 2-7. The deepest units and zones are thus exposed in the outer parts of the trough in the west, north and south, while the upper units occur in the core in the east. The eastern part of the intrusion bends and continues southwards.

The northern fold limb is generally steep to vertical, getting steeper towards the east, even overturned in the northeast where it dips locally to the north. The southern limb is slightly shallower but shows the same steepening trend towards the east. A jotunitic dyke has intruded the hinge zone of the fold and has disrupted the layering there. Several faults were mapped by the NGU, but none seem to have offset of more than some tens of metres. More work is required to improve the understanding of the fault structures.

The trough shape continues southwards to the Sokndal part of the intrusion and splits into eastern and a western part (see inset map in Figure 2-1).

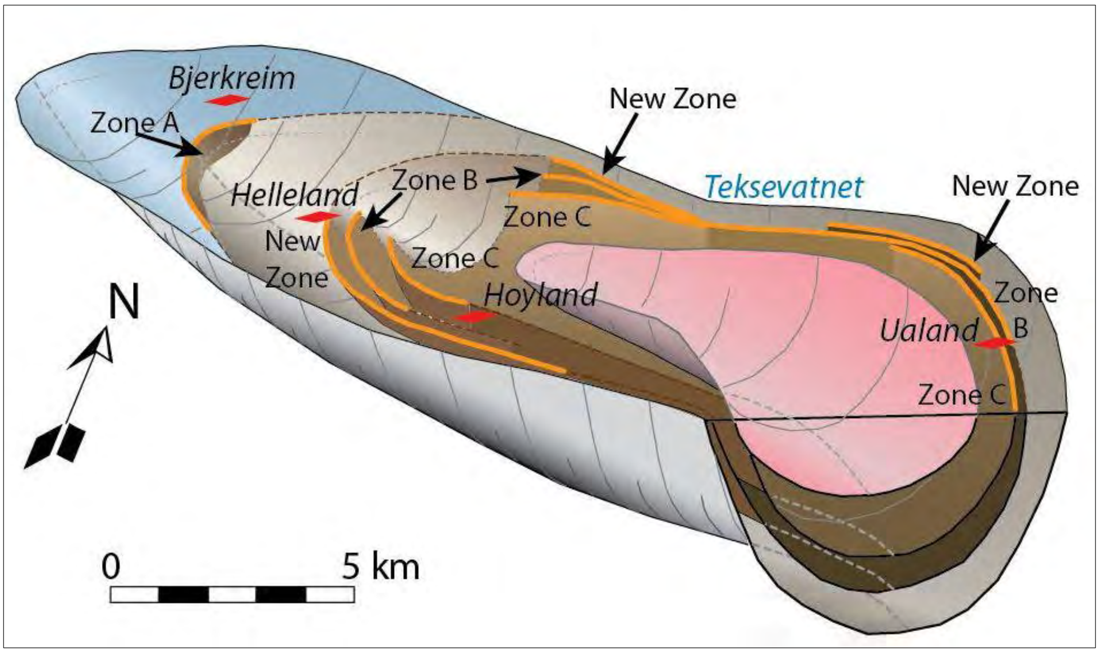


Figure 2-7 Sketch of the 3D shape of the Bjerkreim lobe of the BSL intrusion (SRK, 2019)

Stratigraphic levels that contain the mineralised zones in brown and orange. Viewing direction towards the north.

The geological map shows that the trough is indented in the northern limb (Figure 2-8A). The magnetic map emphasises this feature and shows clearly that the magnetic anomalies terminate towards the indentation (Figure 2-8B). Stratigraphic layers tend to thin towards the anomaly (Jensen et al., 2003) with the indentation coinciding with Lake Teksevatnet. It is shown in Section 4 that the character and chemistry of the mineralised zones change from western side to the eastern side of the lake. There also appears to be an overall tendency of the grade of mineralisation to decrease away from the lake to the east and the west.

SRK's current interpretation is that this indent formed an elevation high on the floor of the magma chamber during intrusion. The flanks of this ridge formed basin-like troughs where heavy minerals accumulated to a greater degree (Figure 2-9). During deformation, when the units were folded, this high was tilted and is now expressed as an indentation, bending the layers in the northern limb as well as the centre line of the trough which follows the same indented/curved shape (Figure 2-8A). This interpretation explains why the grade is elevated near the indentation and decreases moving away. The indentation could also explain why layers in this part of the trough are overturned.

Wilson et al. (1996) have addressed the issue of onlapping layers as a result of this topographic feature on the magma chamber floor, and it was also discussed by Jensen et al. (2003).

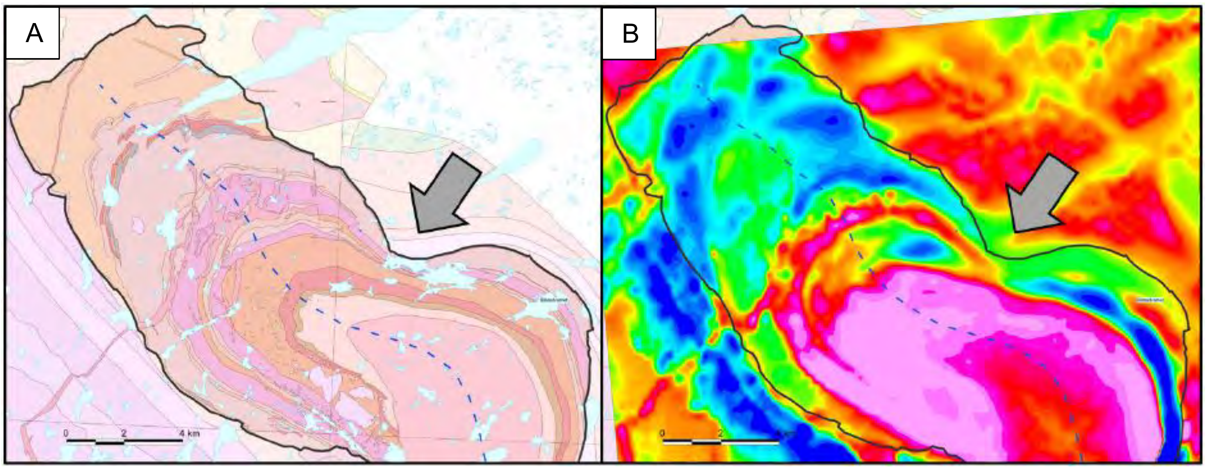


Figure 2-8 Geological and aeromagnetic maps of the layered intrusion with indentation

A) Geological map (legend as in Figure 2-1); B) aeromagnetic total field map highlighting the indentation of the northern limb of the trough. Note that the axial trace, marked by the dashed line, follows the indentation. The black line marks the outline of the intrusion. The grey arrow highlights the indentation.

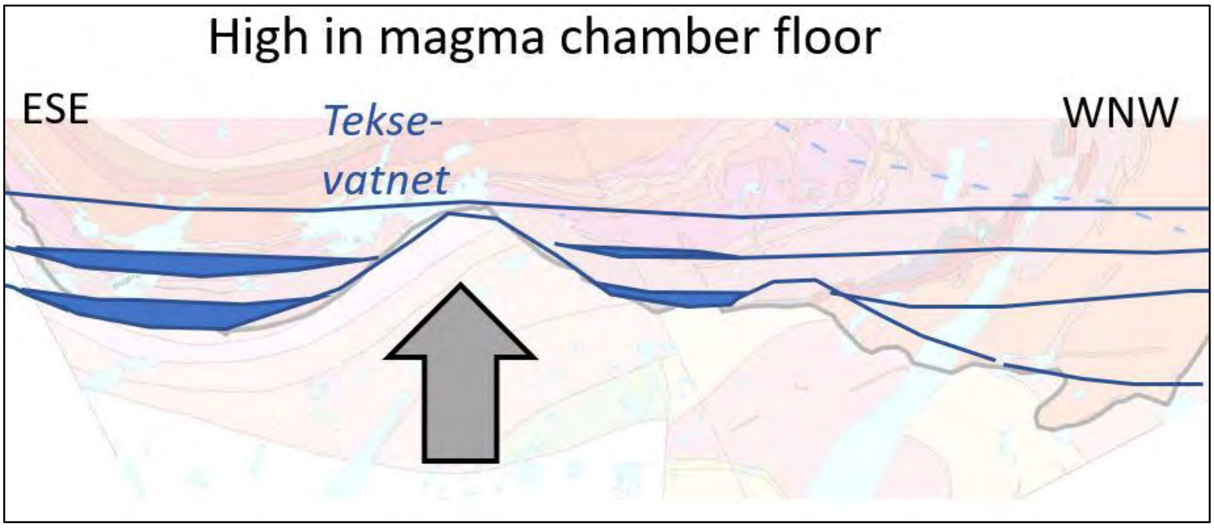


Figure 2-9 Conceptual sketch of the intrusion showing the irregular floor topography

The sketch.is a section through the northern part of the intrusion at a time before it was folded into a trough shape. The areas in blue show the areas where the highest concentrations of heavy minerals settled. The shape of the floor has been drawn to a large extent tracing the northern boundary of the intrusion in the geological map (pale map in the background).

3 CHANNEL SAMPLING

The main objective for this phase of work was to undertake a sampling programme over the already defined mineralisation zones at Bjerkreim. This programme was undertaken in April-May 2019 and consisted of continuous channel sampling across northern mineralised zones within the project area. The sampling objective was to test grade continuity and obtain more representative data set than that produced by historical rock chip sampling (NGU). This sampling was also aimed at testing the NGU's assumptions of continuity across such areas were valid or otherwise before committing to a drilling programme.

Based on the historical sampling work and geological mapping carried out by the NGU, the main target for this work was the mineralised Zones B and C of the Bjerkreim Lobe, within the MCU III and MCU IV megacyclic units respectively (Figure 2-1). The sampling locations were in the northern part of the licence area, to the west and east of Lake Teksevatnet (Figure 3-4). These were chosen because of their coverage by historical exploration, favourable amount of exposed rock and access considerations. In addition to that, the new mineralized zone defined by SRK during fieldwork, referred to as "NEW Zone", was sampled as well.

3.1 Channel Sampling Method

Channel sampling was undertaken with a petrol driven diamond saw (cut-off saw) over representative sections of the mineralised zones where there was reasonable exposure. Due to the widespread regolith and vegetation cover within the area, most of the sites selected were on the shores of lakes or at the top of ridges/hills. In several locations, thin vegetation and soil was removed to expose rock for sampling. All effort was made to sample as much of the stratigraphic width of each zone as possible (i.e. from footwall to hanging wall), but this was not always achieved given limited exposure and indistinct mineralisation boundaries.

It was fortunate that, at the time of sampling, the water level within Lake Teksevatnet had been lowered substantially to facilitate work on a dam, thus providing excellent opportunities for uninterrupted sampling along the shorelines. Most of these sampling locations are now below the current water level.

The channels were installed with two parallel cuts, perpendicular to the banded mineralised targets with 30-40 mm spacing and 50-70 mm depth. To aid with the extraction of the sample, the second cut was inclined as shown on the schematic below in Figure 3-1A and in Figure 3-2. When the exposure of the mineralised unit was buried or otherwise obstructed along the sampling profile, the channel was moved along strike the minimum distance possible. Care was taken to ensure the sampling continued at the same stratigraphic level within the mineralised sequence. This 'offsetting' was aided by the distinct banding which varied in thickness, making them identifiable within the local context of the unit. An example of this offset and reasons for it is shown below in Figure 3-1B. If an offset of >10 m was required, a new channel was collared and gaps in the sample profile were included if the overburden could not be cleared or other obstacles were encountered (roads etc). Each channel was treated as if it were a borehole. The start (or collar) position was recorded using a hand-held GPS and each section of the line including offsets were measured along a tape measure, and the dip and azimuth of each section noted. Once surveyed and photographed, the line was sampled.

The sample intervals were set to a maximum length of 1.5 m (a few samples at the start of the programme were larger before this was defined) and a minimum of 0.5 m. Sample intervals were limited to continuous line segments, i.e. individual samples were not split along an offset or a survey deflection point. The average sample volume from this sampling was 2,160 cm^3/m (calculated using field measurements of the channel after sampling), averaging 5 kg/m sample weight.

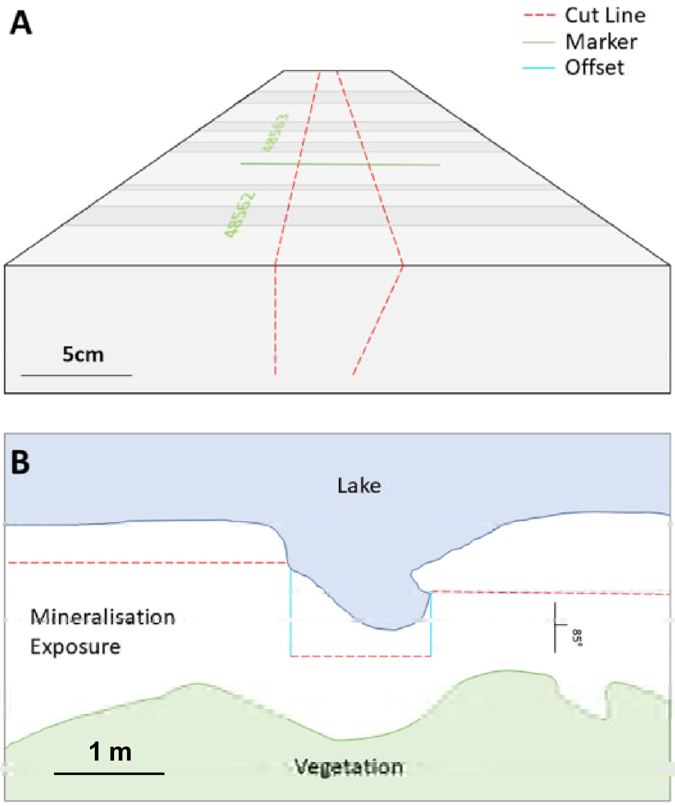


Figure 3-1 Schematics of channel sampling method

A: 3D visualisation of channel cutting; B: Map view of channel trace showing offsets. Dip and strike symbol refers to banding in the rock

Figure 3-2 Photograph showing a cut channel after the sample had been removed

3.1.1 Chanel Sampling Procedure

The channel samples were collected using the following step-by-step procedure:

1. Walk the area to be channelled and mark start and end of the targeted mineralised unit;
2. If necessary, remove any vegetation/shallow soil/regolith from the exposure
3. Lay a tape measure over the planned channel transect, ensuring that it is perpendicular to the strike of the banding and ensuring that all offset start and finish points are accurately located within the unit (Figure 3-3A). On all inflection points (especially acute offsets), care was taken to ensure that no excess distance was lost on the tape measure;
4. Survey in the start and end point with a handheld GPS using an average waypoint until 100% confidence (limited to ±5 m);
5. Mark all the major inflection points on the topography along the channel transect, for example an acute slope change, break of slope or offset;
6. The channel transect was surveyed using the line and compass method between all the demarcated inflection points and marked with marker spray/pen;
7. Sample intervals were demarcated and assigned unique sequential numbers along the sample transect (Figure 3-3B) including appropriate QAQC samples (See Section 3.4);
8. The intervals were photographed and renamed with reference to the sample number;
9. The channels were cut both along the sample transect (Figure 3-3C) and crosscut at the sample intervals;
10. The cuts were thoroughly washed removing as much of the cuttings as possible;
11. The samples were broken out using hammers and chisels (Figure 3-3D) and placed straight into a marked material sample bag with a ticket inside (Figure 3-3E);
12. The sample were removed, and the cut outcrop washed again;
13. The channel was geologically and structurally logged, utilising the fresh faces of the cut channel;
14. The samples were weighed, remaining QAQC samples (blanks and CRMs) inserted and packed for dispatch (Figure 3-3F).

3.2 Channels

A total of 21 profiles were channel sampled over Zone B, C and NEW of the Bjerkreim Lobe, east and west of Lake Teksevatnet (Figure 2-1), totalling some 500 m of channel sampling. A total of 398 samples (458 inclusive of QAQC samples) were taken during this sampling programme. The locations of these channels are shown in Figure 3-4 to Figure 3-7.

Figure 3-3 Channel sampling method

A: Area cleared and taped out; B: Channel profile and samples marked out; C: Cutting channel; D: Sample broken out of cut channel, E: Sampled bagged up; F: Samples batched up for dispatch.

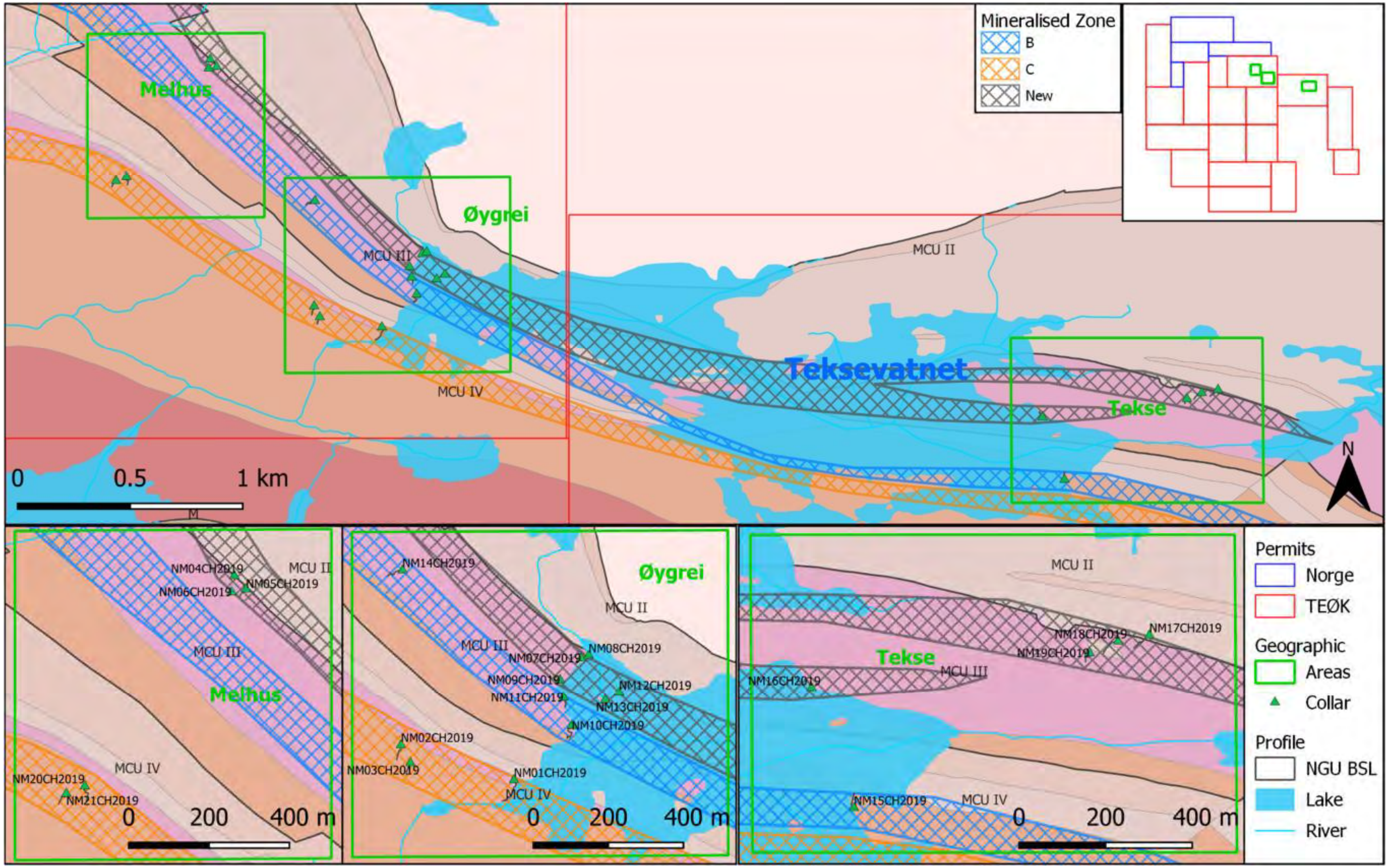


Figure 3-4 Map showing location of channel samples

Legend for geological background shown in Figure 2-1.

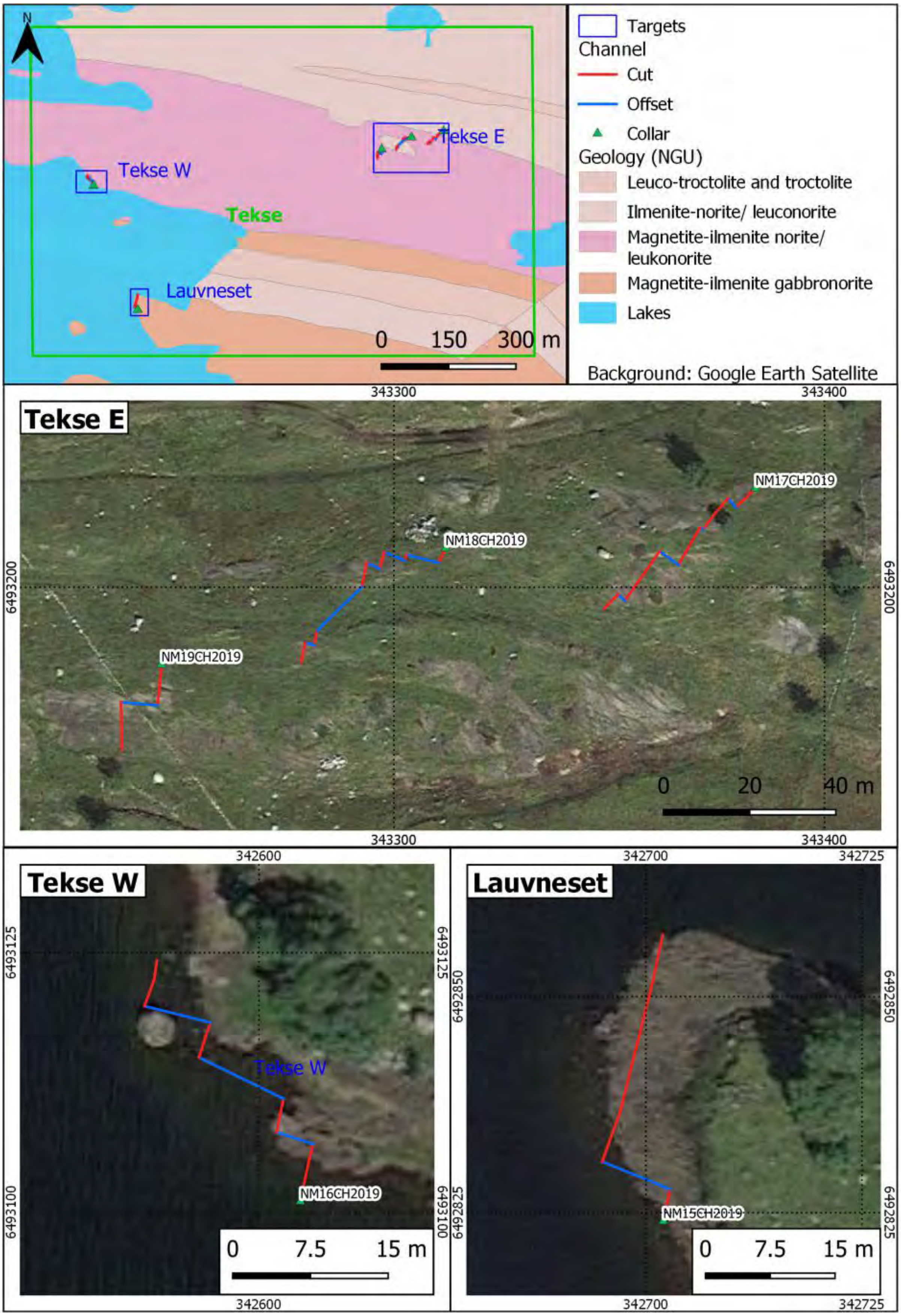


Figure 3-5 Tekse area channel locations

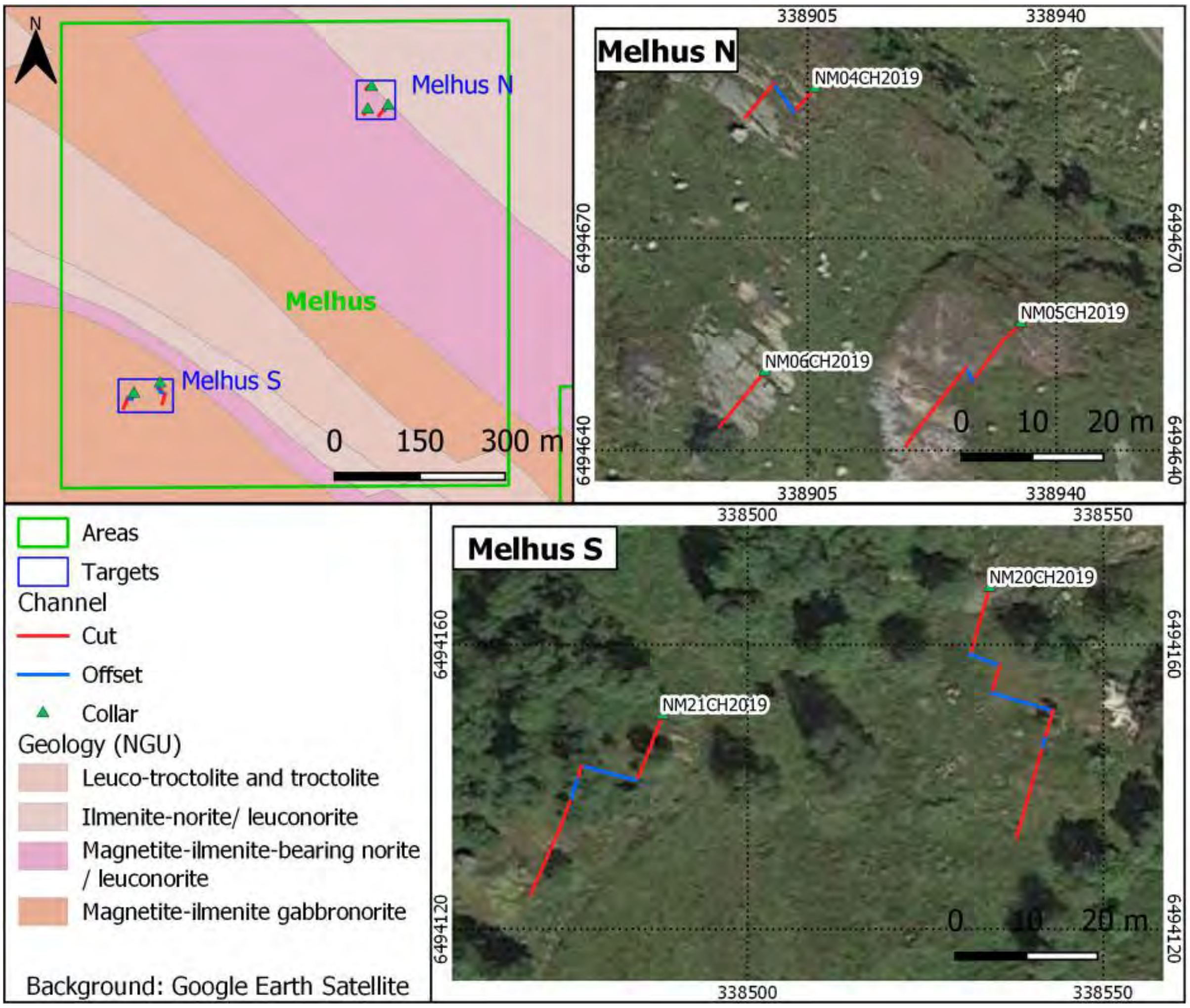


Figure 3-6 Melhus area channel locations

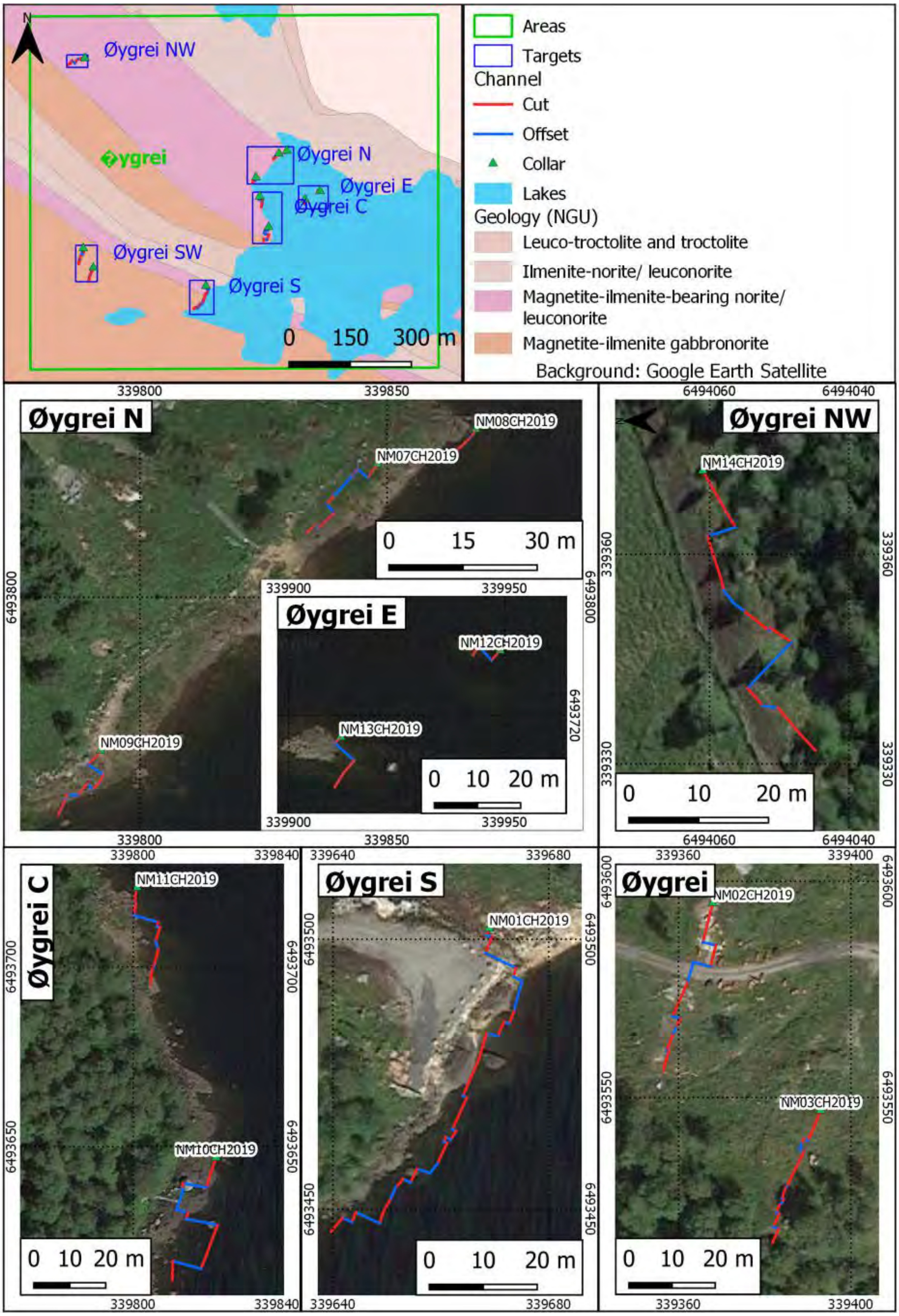


Figure 3-7 Øygrei area channel locations

3.3 Sample Preparation and Analysis

3.3.1 Sample Preparation

Sample were sent for preparation at ALS Geochemistry in Pitea, Sweden. Here the following sequence was used:

1. The whole sample was crushed to pass a 6 mm sieve;
2. A 2 kg split was taken from the <6 mm material;
3. The 2 kg split was crushed to 70% less than 2 mm, 250 g split off by riffle splitter and the split pulverised to 85% passing a 75 µm sieve (ALS code PREP-31);
4. The pulverised material was then sent to ALS Geochemistry in Loughrea, Ireland, for analysis.

The remaining 6 mm material was stored until analytical results were available. Upon receipt and review of the results, a subset of samples of this material were selected and combined into three composite samples for mineral processing test work and were dispatched to Wardell Armstrong International's facility in Cornwall, UK.

3.3.2 Sample Analysis

Sample analysis was performed by ALS Geochemistry in Loughrea, Ireland. The method used was lithium borate fusion with XRF finish (ALS code ME-XRF21n). This is often used for the analysis of oxide iron ores and provides a suitable range for the elements of interest for this project (Figure 3-8). This method of analysis uses a 0.7g sample aliquot.

CODE	ANALYTES & RANGES (%)						DESCRIPTION
ME-XRF21u (unnormalized) ME-XRF21n (normalized) **0.7g sample**	Al_2O_3	0.01-100	K_2O	0.001-6.3	Sn	0.001-1.5	Fused disc XRF.
	As	0.001-1.5	MgO	0.01-40	Sr	0.001-1.5	
	Ba	0.001-10	Mn	0.001-25	TiO_2	0.01-30	
	CaO	0.01-40	Na_2O	0.005-8	V	0.001-5	
	Cl	0.001-6	Ni	0.001-8	Zn	0.001-1.5	
	Co	0.001-5	P	0.001-10	Zr	0.001-1	
	Cr_2O_3	0.001-10	Pb	0.001-2	Total	0.01-110	
	Cu	0.001-1.5	S	0.001-5			
	Fe	0.01-75	SiO_2	0.01-100			
OA-GRA05x ME-GRA05	Loss on Ignition **1g sample**						Furnace or Thermogravimetric Analyzer (TGA)

Figure 3-8 Sample analysis method ME-XRF21n (from ALS Service Schedule 2019)

3.4 Data Verification

As part of the channel sampling programme SRK undertook a routine data quality assurance and quality control (QAQC) programme. Checks completed included validation for all tabulated data, including collars and channel surveys both using remote sensing data and, in the field, sampling and assay information. The programme also included the insertion of control samples, routinely into the sample stream for each sample batch with a global insertion rate of 15.1% of the normal channel samples (Table 3-1).

Table 3-1 Summary of QAQC samples

Sample Type	Total #	% of Normal	Comments
Normal Samples	**398**	**100**	
Certified Reference Material	**19**	**4.8**	
OREAS 463	10	2.5	OREAS 463 CRM
OREAS 465	9	2.3	OREAS 465 CRM
Field Duplicates	**21**	**5.3**	Channel sample of duplicate interval
Field Coarse Blank	**20**	**5.0**	Sourced from local Anorthosite
Total QC Samples	**60**	**15.1**	
Total Samples	**458**	**-**	Including control samples

The sample QAQC programme was implemented at this early stage of exploration to ensure that the all sampling data collected is of good quality and to ensure the ongoing quality of the analytical database as the project advances through the exploration cycle. The data can also be used to assess the suitability of sampling and analytical methods for future exploration programmes. The control sample aspect of this work included the following:

- Certified Reference Material ("CRMs" or "standards"): from Ore Research and Exploration, Australia ("OREAS");
- Field Duplicates: additional channel sample, usually cut from the opposing side of the channel or as a parallel sample; and
- Coarse 'Blank' Material: sourced form a local anorthosite quarry and tested in the field by pXRF to be extremely low grade in the target elements compared to the channel samples.

The target insertion rate for each of the above was every 20th sample (5%), giving a total QC sampling rate of 15% of the total normal sample population.

3.4.1 Certified Reference Materials

Two different CRMS were chosen as part of this sampling programme, both sourced from OREAS. The certified values for the two CRMs are provided in Table 3-2 below.

Table 3-2 CRM certified grades for elements of interest

CRM	Fe (wt.%)	P (wt.%)	TiO_2 (wt.%)	V (ppm)
OREAS 463	34.47	0.629	3.21	360
OREAS 465	34.71	3.81	10.51	534

Method: Borate / Peroxide Fusion ICP

It was difficult to find commercially available CRMs that match both the matrix of the local geology and the expected values of the target elements. Both the CRMs used are made from '*CARBONATITE SUPERGENE REE-Nb ORE*' with differing amounts of Total Rare Earth Oxides ("TREO").

All the results are plotted as weight percent (wt.% or %) throughout this section (1 wt.% is equivalent to 10,000 ppm).

SRK has reviewed the laboratory results for TiO_2, P and V for the two CRMs included in this programme. Due to the small populations of results for these CRMs (n.19), the confidence in any conclusions based from these results are limited. However, they do give a good indication into the precision and accuracy of the laboratory's analytical process and to the suitability of these standards for any future work. In summary, OREAS 463 has performed adequately, reporting values within two standard deviations of the certified grades. OREAS 465 has failed, showing a constant underreporting, outside three standard deviations for P and TiO_2. The performance of each CRM is discussed further below.

It is noted that the certified values as stated in the CRMs certificates were produced using a Borate / Peroxide Fusion ICP method, whereas the samples were analysed using a Lithium Borate Fusion XRF method (ALS: ME-XRF21n). The comparison between the reported values and the certified values is therefore not absolute.

OREAS 463

OREAS 463 was used throughout the 2019 channel sampling programme as the lower grade CRM and performed well in comparison to its certified values.

The reported results for OREAS 463 all fall within two standard deviations, however on all three target elements, the mean results fall below the certified value indicating that there may be a minor underreporting issue with this CRM (see OREAS 465 for more details). The results of this CRM for TiO_2 and V are shown in Figure 3-9 and Figure 3-10.

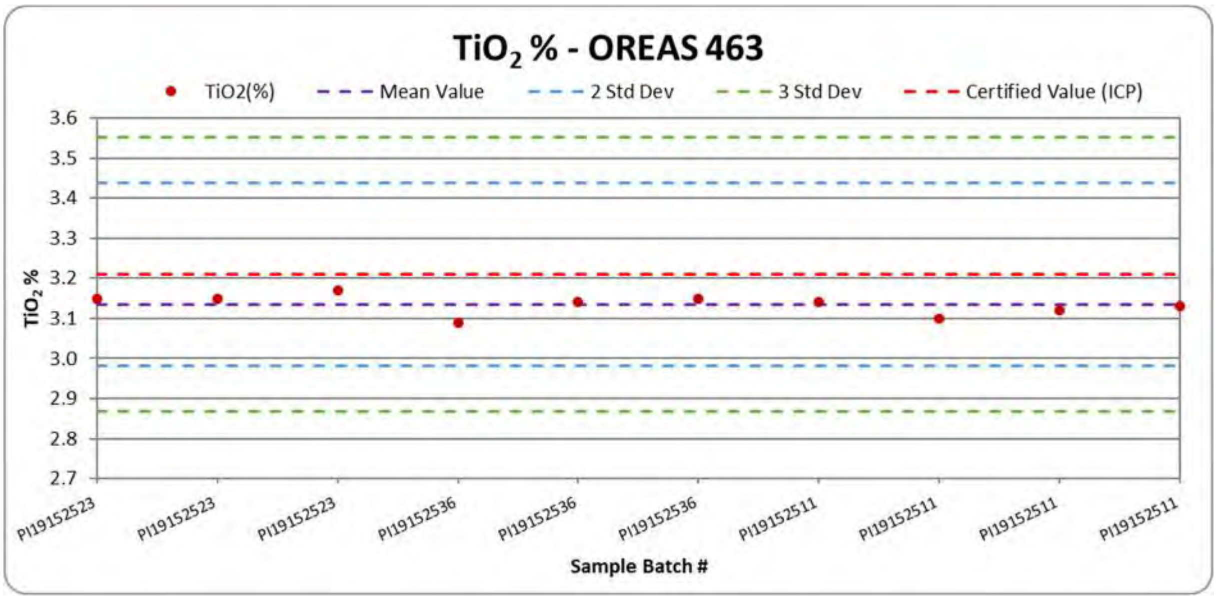


Figure 3-9 Results for TiO_2 in OREAS 463 by laboratory batch

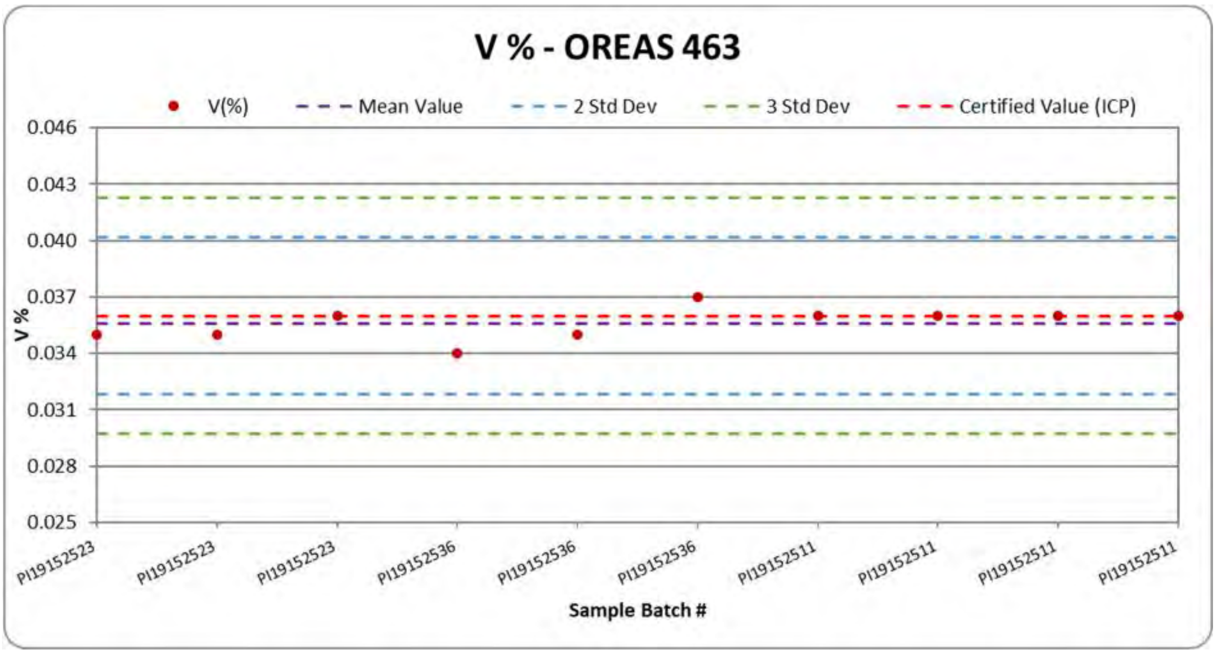


Figure 3-10 Results for V in OREAS 463 by laboratory batch

OREAS 465

OREAS 465 was inserted in parallel with OREAS 463, being preferentially used before intersections of mineralisation that were interpreted (visually) to be higher grade. The reported results from this CRM were poor, falling constantly below two and sometimes three standard deviations (Figure 3-11 and Figure 3-12). The mean value for this CRM even falls below three standard deviations of the certified value for TiO_2. This CRM has therefore failed under normal reporting guidelines.

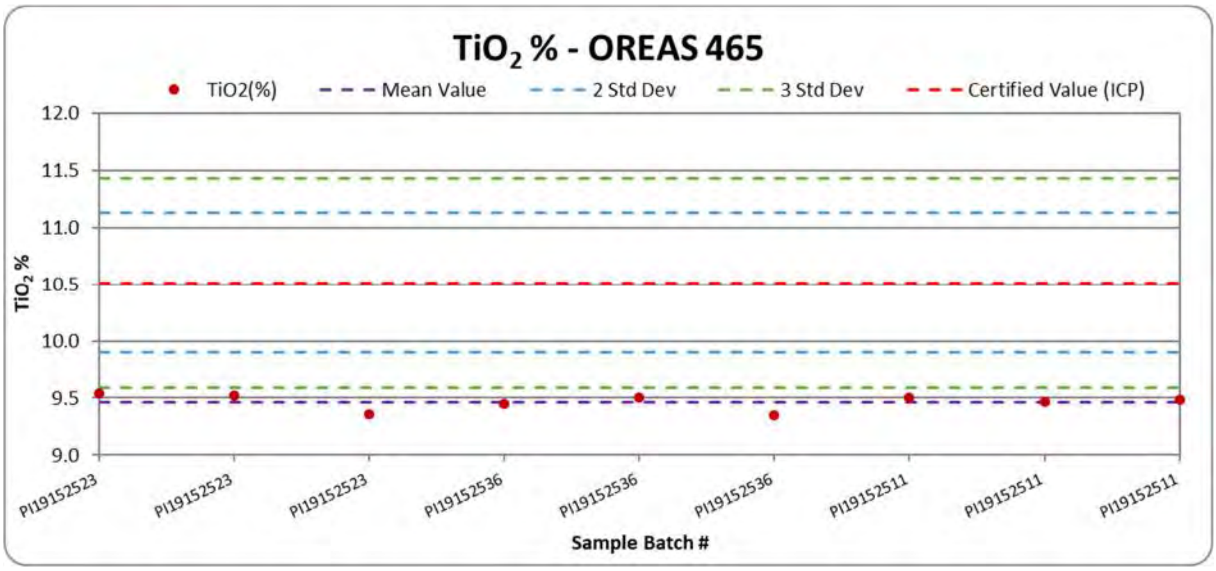


Figure 3-11 Results for TiO_2 in OREAS 465 by laboratory batch

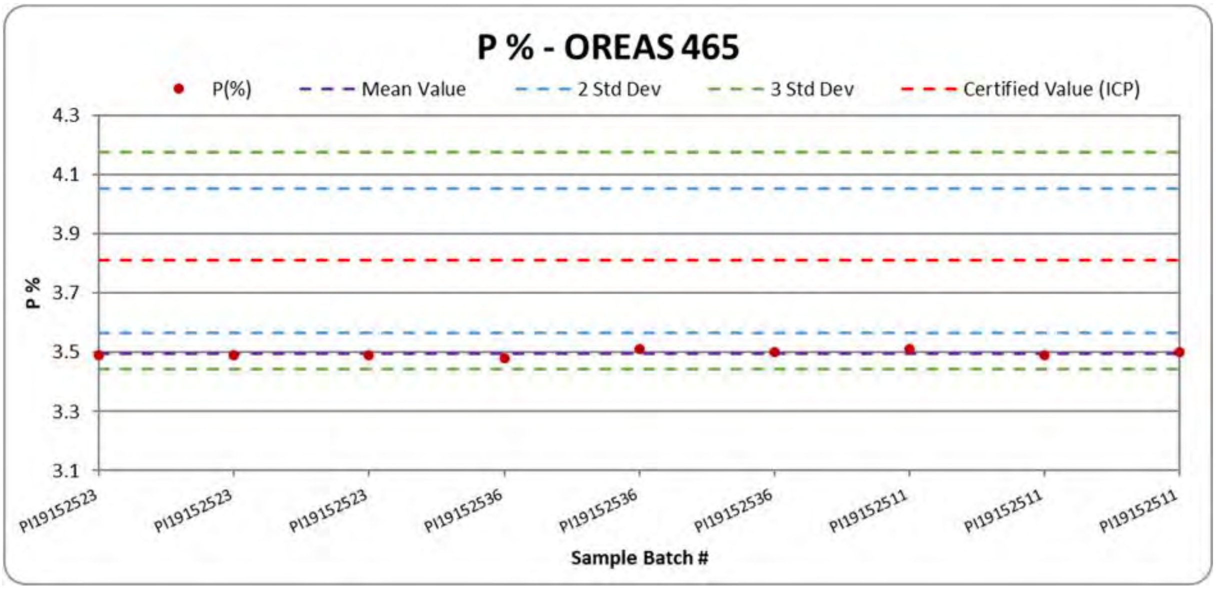


Figure 3-12 Results for P in OREAS 465 by laboratory batch

These types of failed results in a CRM could sometimes indicate a general problem with the laboratory method at certain grades. However, further inspection of the certificates issued by ALS revealed that their internal laboratory QAQC data was good in all respects. The laboratory was then contacted to isolate the issues which contributed to the poor performance of the CRM.

The conclusion to this investigation noted that OREAS 465 has high levels of Rare Earth Elements ("REEs") that are not analysed or reported by the iron ore analytical package used for this programme. This caused problems with the inter-element and Alpha corrections and affected the reported values for the elements that are measured: some being depressed and others overreported. OREAS 463 on the other hand has much lower concentrations of REEs and therefore the results report close to the certified values. These unmeasured elements should be at very low or trace concentrations. The problem is particularly acute with REEs because their high atomic weight increases interference effects.

This explains why the laboratory has included a comment on certificate PI19152511 stating that

'*Due to high concentration of elements not measured in ME-XRF21n method, interelement corrections cannot be applied and results for samples #3,27,51,68,83,104,130 may be unreliable'*. The listed samples are all OREAS 465, and this statement can also be applied to the CRM samples on certificates PI19152520 and PI19152523 (ALS mistakenly left off this comment on these certificates).

SRK concludes that neither OREAS 463 nor 465 are suitable for the analytical method used in this case. Despite this, based on the other aspects of the data verification programme and the laboratory's internal QAQC, SRK is confident that the channel samples are unaffected by this problem and that their analytical results are sufficiently accurate and reliable. If further sampling programmes are undertaken on this project, SRK recommends creating new CRM material using the coarse reject material from the channel samples. SRK can assist with this process if required.

3.4.2 Blanks

A coarse field blank was chosen by SRK from an anorthosite quarry located at 327485 mE, 6489017 mN, c. 10 km west if the project area. The rock here is homogeneous with no visible Fe-Ti-P mineralisation. This material is not certified and was not analysed by a laboratory before its use in this programme, but it was analysed by pXRF in the field and was shown to contain negligible grades for the target elements.

The purpose of blank samples is to test the cleaning procedures of the preparation lab, which should ensure that cross-contamination between samples does not occur. These samples were inserted as a coarse material which would need to undergo the same preparation sequence as the channel samples. They were used at the end of every channel profile and after some samples that showed significant visual mineralisation, perceived to be high grade. An insertion rate of insertion of 5% was maintained throughout the programme.

The results show that the field blank material contained very minor Fe-V-Ti-P mineralisation, reporting values above the lower Limit Of Detection ("LOD") (Figure 3-13 & Figure 3-14). However, the results of these elements are very constant, in line with the homogeneity of the source lithology and type. If there were any contamination issues at the laboratory, these would be represented by a variation in the average result which is not seen. The results for all elements of interest fall below the mean plus three standard deviations.

SRK recommends that, if possible, coarse blank material that is known to be void of any Fe-V-Ti-P mineralisation is sourced from outside the project area and geologically unrelated to it in any way. This material used in this programme is, however, appropriate to indicate any issues at the preparation stage and is therefore fit for purpose.

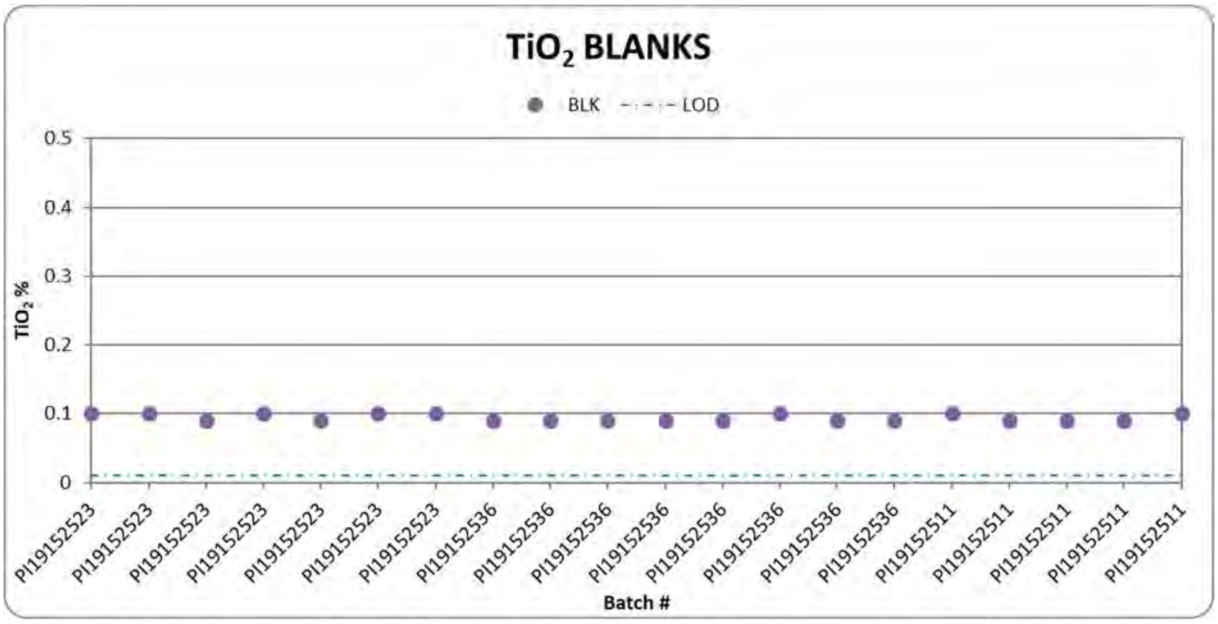


Figure 3-13 Blank TiO_2 results by laboratory batch

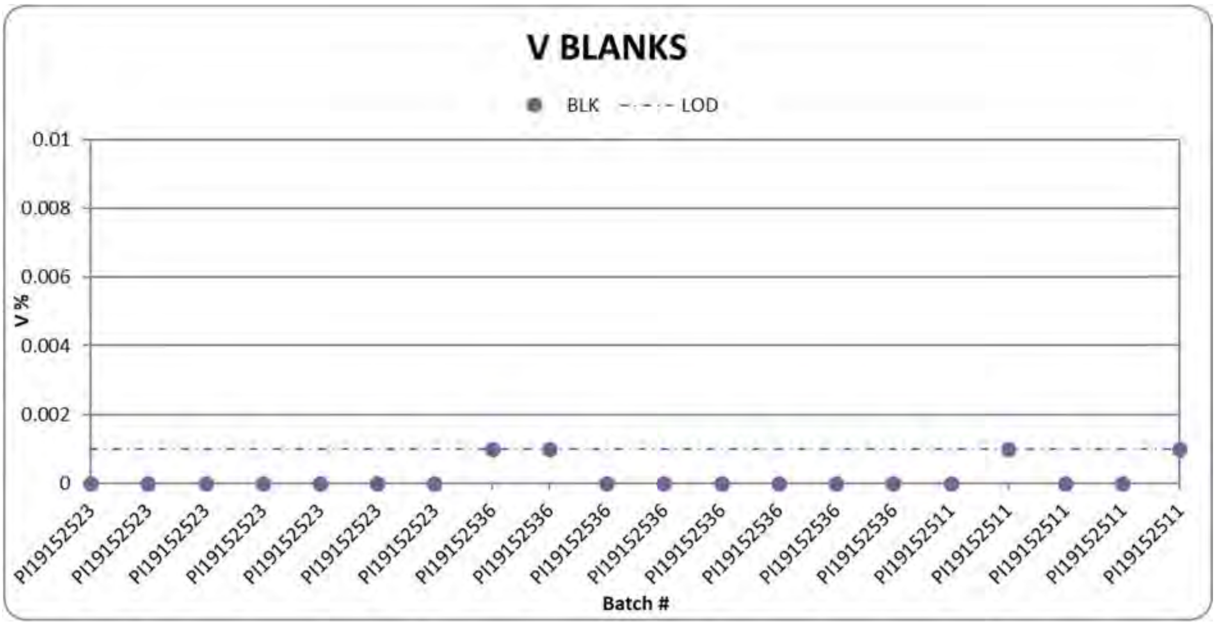


Figure 3-14 Blank V results by laboratory batch

3.4.3 Field Duplicates

Field duplicates were taken at the sampling stage, from the opposite side of the channel or, occasionally, as an offset parallel sample at the same stratigraphic position (Figure 3-15 and Figure 3-16). The purpose of these is to assess how representative and repeatable the sampling method is in relation to the mineralisation style and variability. It also helps to understand very closed-spaced variability (if any) within mineralised zones.

A total of 21 field duplicates were taken as part of this programme. Whilst this is a small population, the results for these samples do indicate that the sampling method was suitable for the mineralisation type and has not introduced variability between samples.

There is a very good correlation between the parent and duplicate sample with all elements of interest (Figure 3-17). SRK concludes that this confirms low variation within the mineralised material and that the relatively large size of the channel samples has produced data that is representative of the in-situ mineralisation.

Figure 3-15 Examples of field duplicate samples using the opposing side of the channel (left) or a parallel sample (right)

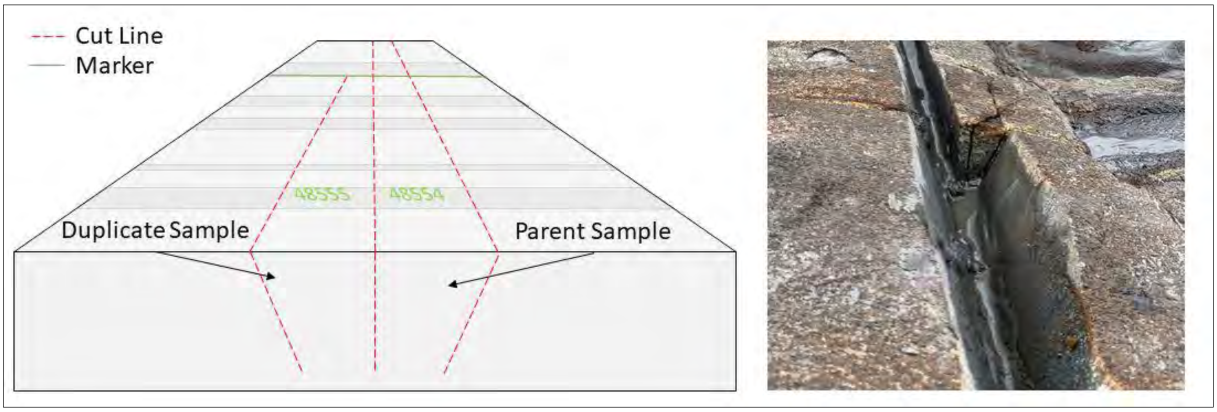


Figure 3-16 Duplicate Sample method

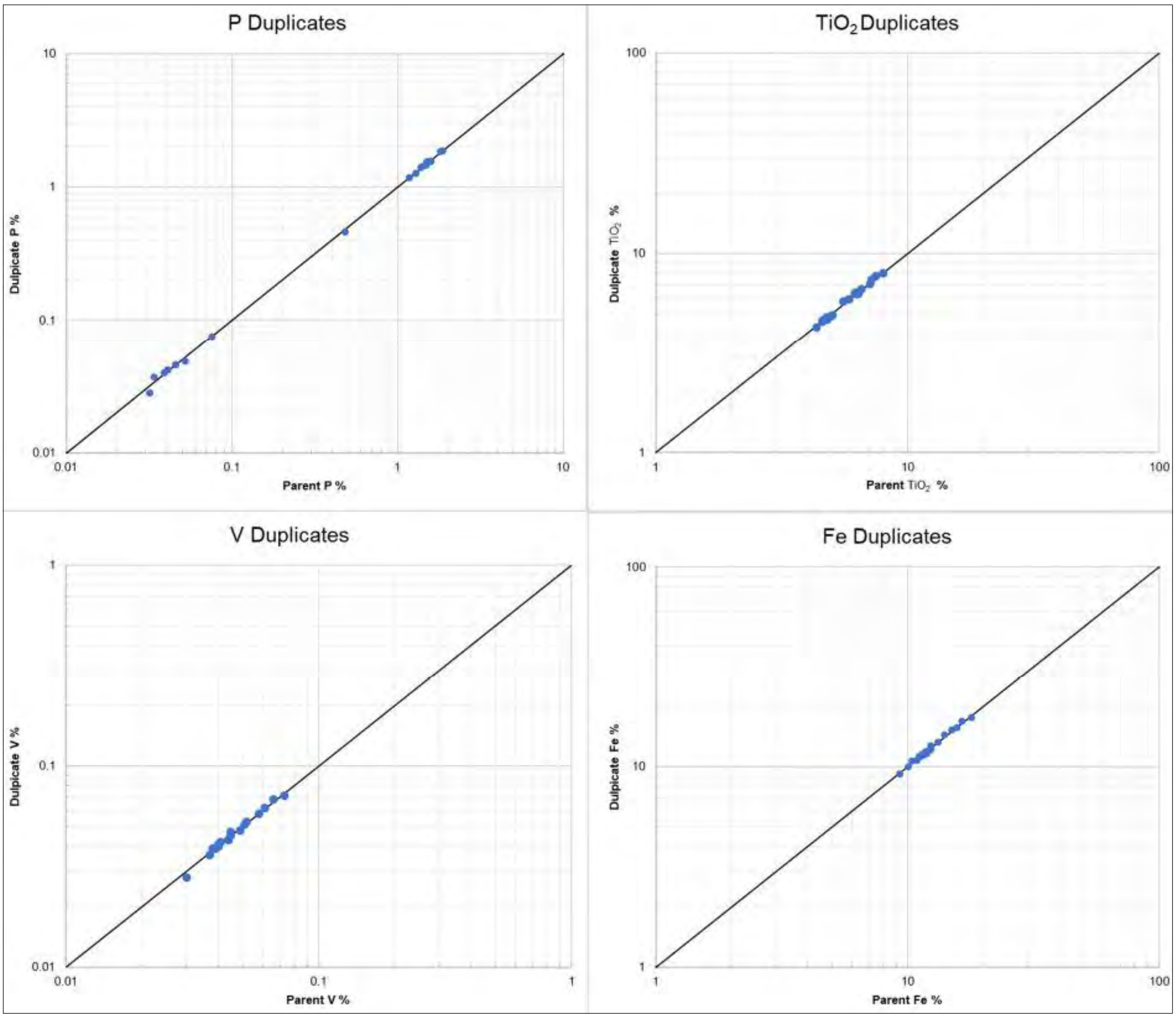


Figure 3-17 Comparison of field duplicate results

The reference correlation line represents a 1:1 ratio

4 CHANNEL SAMPLE ASSAY RESULTS

Table 4-1 provides a summary of the channel sample assay results. These are also shown graphically in Figure 4-1 and Figure 4-2 where the grades for P_2O_5, TiO_2 and V_2O_5 are plotted. Figure 4-1 also includes Fe_3O_4 and shows the grade distribution through the channel sampled zones. In Figure 4-2 channels are combined where they are collected in semi-coherent sections through a single mineralised zone. Thus, a section through a mineralised zone can consist of one or more channels. Results are organised per zone. Note that channel 15 is categorised as Zone B, despite the fact that it is located in a mineralised zone that is designated as Zone C by NGU. This new interpretation is based on the chemistry of the rocks of channel 15, which is more like that of Zone B than of Zone C. This is discussed in more detail in section 4.2. Approximate locations of the channels are indicated in Figure 4-3, and more precisely in Figure 3-4 to Figure 3-7.

Where the sample results from the ALS XRF analysis returned elemental grades, these have been converted into oxide grades using molecular mass calculations were applicable:

- P to P_2O_5
- V to V_2O_5
- Fe to Fe_2O_3*

**The iron is split between various minerals (see Section 7) however it is presented as Fe_2O_3 as to relate to the historical NGU datasets.*

4.1 Main Results

The data presented in Table 4-1 represents the weighted averages (by sample interval) per channel or group of channels in one mineralized zone. The table also shows the average grades per sampled mineralised zone. The general results are that Zone B has the highest overall grade of the three zones for two of the three targeted elements plus iron (Figure 4-3) and for the total content of economic minerals apatite, ilmenite and vanadium-bearing magnetite. NEW Zone has the lowest overall content of economic minerals as it lacks apatite, but has a slightly higher ilmenite content than Zone B. of the target elements:

- Phosphorous, in apatite, occurs in its highest grades in Zone B, c. 1% higher than in Zone C. The P_2O_5 grade appears very consistent in Zone B, slightly less so in Zone C. There is minimal phosphorous content in NEW Zone;
- Titanium, in ilmenite, is highest in NEW Zone, slightly (c. 0.3% TiO_2) lower in Zone B and c. 1.8% TiO_2 lower in Zone C, which is a significant difference;
- Vanadium, in magnetite, is significantly higher in Zone B than in the other two mineralised zones and lowest in Zone C.
- The total of economic minerals (apatite, ilmenite plus magnetite) in the three zones are highest for Zone B and lowest for NEW zone.

From the sample assay results, it is possible to estimate the modal mineralogy of the samples with the assumption that the sample is solely composed of a set number of minerals, namely; Plagioclase feldspar (Plag), Apatite (Apt), Ilmenite (Ilm), Clinopyroxene (CPX), Orthopyroxene (OPX) and Magnetite (Mag). SRK has undertaken the same modal mineralogy calculation used by the NGU in historical exploration (Schiellerup et al., 2001) and notes that although this will give a good indication of the minerology, it has certain limitations based on the above assumption and that this will tend to positively bias the results.

Table 4-1 Summary of channel sample assay data

Channel	Zone	No. Samples	Length (m)	XRF Assay			Model Mineral Composition %						Total Economic Minerals %
				P_2O_5 %	TiO_2 %	V_2O_5 ppm	Plag	Apt	Ilm	CPX	OPX	Mag	
10+11	B	48	58.4	4.14	6.42	1128	26.5	10.2	12.8	8.9	33.0	8.5	31.5
14	B	25	31.6	4.14	6.54	1145	25.2	10.3	13.0	11.8	31.0	8.8	32.0
15	B	23	30.9	4.19	5.72	858	30.3	10.5	11.5	6.7	33.3	7.7	29.7
B		**96**	**120.9**	**4.15**	**6.27**	**1064**	**27.1**	**10.3**	**12.5**	**9.1**	**32.5**	**8.4**	**31.2**
1	C	43	57.8	2.93	4.62	691	47.3	7.4	9.3	6.7	24.1	5.2	21.9
2+3	C	58	63.8	3.45	4.86	737	43.0	8.7	9.8	7.7	24.3	6.5	25.0
20+21	C	44	56.7	3.32	4.93	829	44.1	8.3	9.9	8.9	22.8	6.0	24.2
C		**145**	**178.3**	**3.24**	**4.80**	**751**	**44.8**	**8.1**	**9.7**	**7.8**	**23.8**	**5.9**	**23.7**
4+5+6	NEW	34	44.9	0.11	5.98	781	50.5	0.3	12.1	4.8	27.9	4.4	16.8
7-9+12-13	NEW	43	48.7	0.11	7.17	931	43.6	0.3	14.6	4.0	31.7	5.8	20.7
16	NEW	15	17.1	0.09	5.74	816	49.3	0.2	11.5	3.2	30.1	5.7	17.4
17+18+19	NEW	65	86.3	0.08	6.74	895	45.8	0.2	13.6	5.0	30.9	4.4	18.2
New		**157**	**196.9**	**0.10**	**6.58**	**871**	**46.6**	**0.2**	**13.3**	**4.6**	**30.4**	**4.9**	**18.5**

These assay data are weighted (by length) and averaged per section through individual mineralised zones. Each section can consist of one or several channels. Note that these data vary slightly from previously internally presented results which were unweighted averages (in the preliminary result presentation of August 2019). Modal mineral compositions are calculated in the same way as the NGU calculations (Schiellerup et al., 2001) and are thus comparable.

From Figure 4-2 and the detailed descriptions of the plotted data in Appendix A, the following can be interpreted.

4.1.1 New Zone

NEW Zone has some of the highest TiO_2 grades, but the grades are highly variable both between samples within a single channel and between channels. NEW Zone contains no significant apatite and V_2O_5 grades vary in a similar way to the TiO_2 grades, with values in between those of Zones B and C. Furthermore, the width of the zone varies significantly, from a single zone of 40 m width at Melhus Farm (channels 4 to 6, location MN in Figure 4-2) to a 115 m wide composite zone of interlayered banded, high-grade rocks and more homogeneous felsic rocks on the western side of Lake Teksevatnet (Øygrei NE, channels 7 to 9, 12 and 13, location ØNE in Figure 4-2).

On the east side of Lake Teksevatnet, the same change is seen, from several mineralised zones of 10-20 m width (e.g. channel 16, location TW in Figure 4-2) separated by tens of metres of more homogeneous and more felsic, low-grade rocks (e.g. on the Langnese peninsula, location TW in Figure 4-2), to a single zone of continuously mineralised rocks that is c. 100 m wide at Tekse Northeast (channels 17 to 19, location TE in Figure 4-2).

4.1.2 Zone B

The highest TiO_2 and V_2O_5 grades observed for Zone B in this exploration programme are found west of Lake Teksevatnet (channels 10, 11 and 14) compared to east of the lake (channel 15). According to the NGU definition, only the sections at Oygrei NW (Lusiknuten) and at the western shore of Lake Teksevatnet (Oygrey C) are Zone B. However, the chemical characteristics of, channel 15 at Lauvneset (east end of Lake Teksevatnet, Location LAU in Figure 4-2) resembles the other Zone B sections and is therefore included in Zone B (see explanation in Section 4.2). Therefore, SRK has re-designated a large part of the mineralisation previously mapped by NGU as Zone C east of Lake Teksevatnet to Zone B.

Zone B rocks are more mafic than the other zones and have the highest grades in two of the three target elements/oxides, P_2O_5 and V_2O_5. The plots for the three sections through Zone B are quite distinct, but the plots for channel 14 and 15 (at ØNW and LAU in Figure 4-2) resemble the upper (southern) part of the channels at the western shore of Lake Teksevatnet, channel 10 (ØC in Figure 4-2). Variations between samples in channel 11 are greater than in the other channels of Zone B. Only the coincident but opposite peaks (positive and negative) of TiO_2 and P_2O_5 in channel 14 is quite uncharacteristic. The sections of channels 14 and 15 are significantly shorter than that of channels 10 + 11, but the first two are open-ended, while at the latter two channels the total width of the mineralised zone is well constrained.

4.1.3 Zone C

Of the three zones, the grades of Zone C are most consistent with the least variation between samples in a single channel, but also the lowest. The package is also the most felsic of the three zones, with norites being the dominant rock type. It is interpreted that the mineralised grade of the felsic noritic rocks is higher in this zone compared to the others, but there is a significantly lower proportion of mafic (dark) rock bands that contain most of the economic minerals.

The grades in Zone C decrease slightly from Melhus S (MS in Figure 4-2) to the lake shore (channel 1 at ØS in Figure 4-2). No channel samples for Zone C were taken to the east of Lake Teksevatnet (assuming SRK's re-designation of Zone C to Zone B in this area is correct).

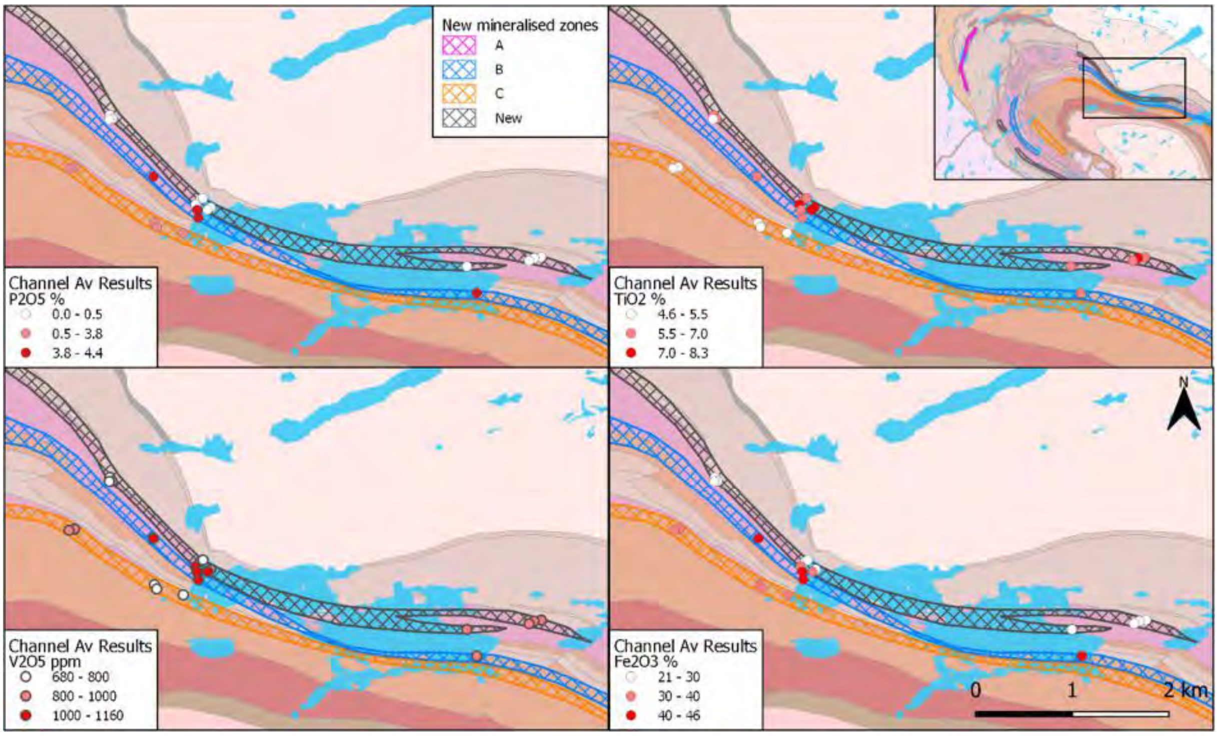


Figure 4-1 Overview of average grades in the channel-sampled mineralised zones

The plotted assay data are weighted averages per channel for the four economic oxides. Legend for geological background shown in Figure 2-1.

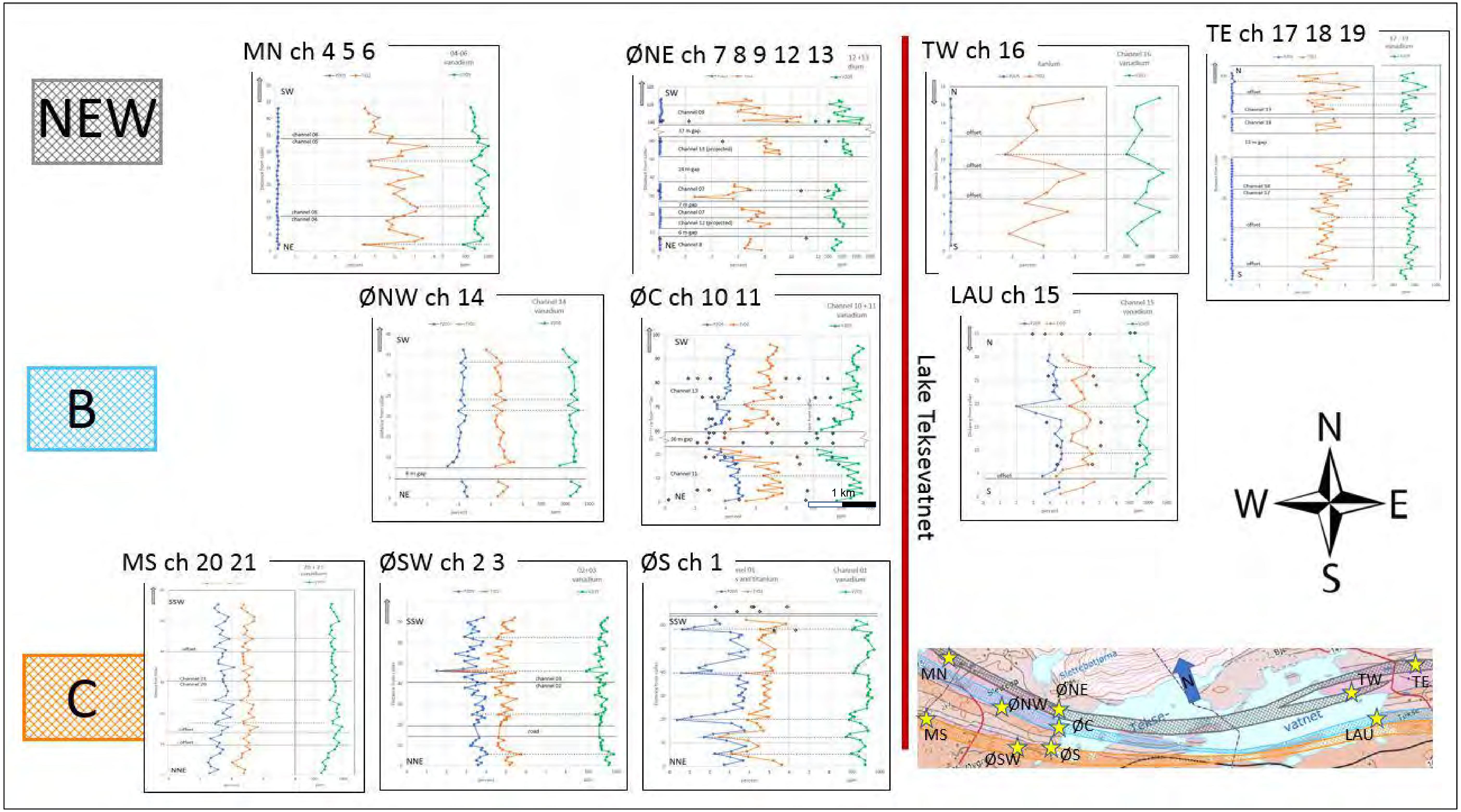


Figure 4-2 Overview of the P_2O_5, TiO_2 and V_2O_5 channel profiles in the central part of the area, grouped per mineralised zone

Blue: P_2O_5, orange: TiO_2, green: V_2O_5. Horizontal scales (concentrations) are approximately the same for all plots, vertical scales are not. Full scale versions in appendix A. Mineralised zones in the inset map show the new SRK interpretation.

4.2 Zone Differentiation Based on Chemistry

Mapping of the various geological units and mineralised zones in the intrusion is complicated by the fact that they are visually difficult to distinguish in the field. The channel sampling dataset has, however, provided a good opportunity to assess the chemical characteristics of each zone so that this can be used as a means of differentiation. This has proved particularly important in resolving some differences in interpretation between NGU and SRK in the location and extent of some of the mineralised zones.

The chemical distinction of NEW Zone from Zones B and C is simple, based on the lack of apatite (and thus phosphorous) in NEW Zone which occupies a lower stratigraphic level. However, Zones B and C have the same stratigraphic position, each within their own Mega Cycle Unit (MCU) and therefore have similar mineral composition and chemistry.

Figure 4-3 shows the differences in grade of the three targeted elements plus iron for the three zones. It shows clearly that, for all four elements, Zone B is higher grade than Zone C, but also that there is a large overlap when the compositions of individual samples are considered. The averages calculated per channel fit well with this distinction of zones.

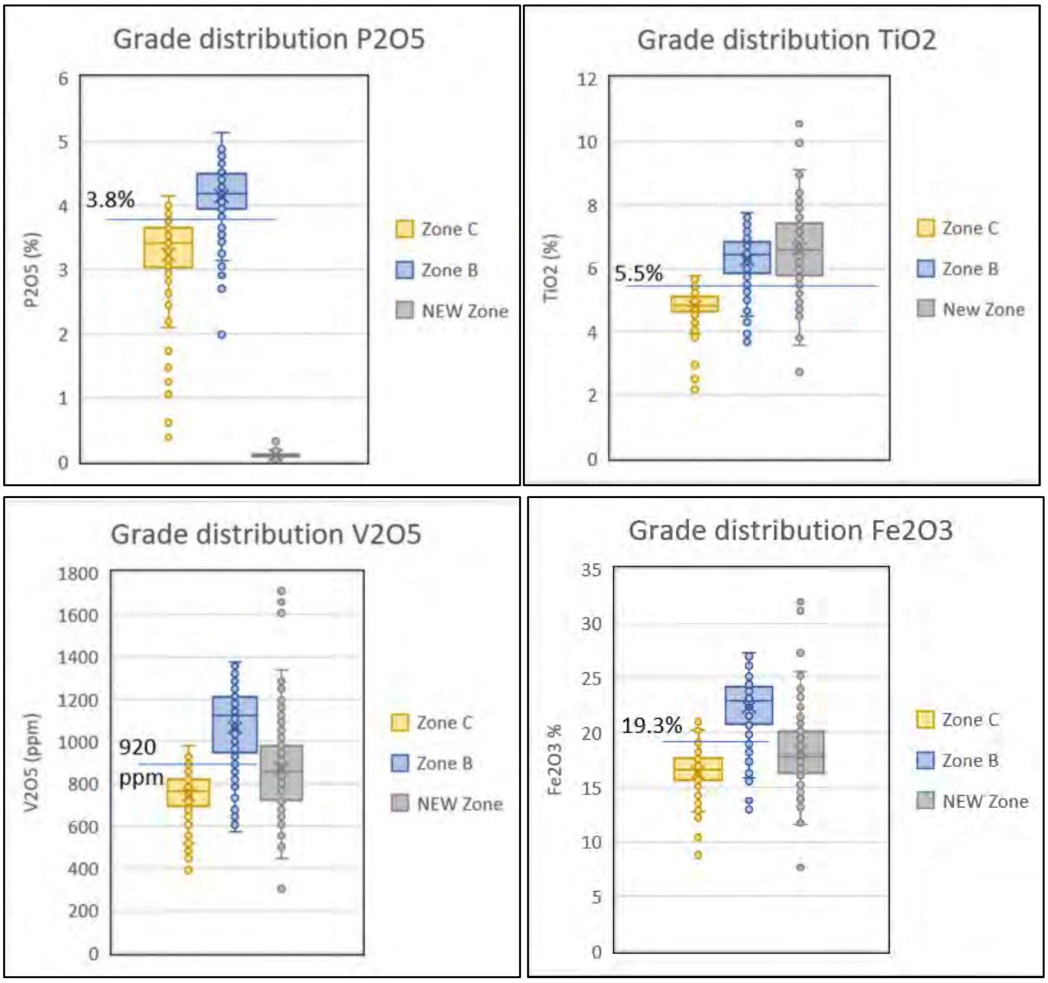


Figure 4-3 Box and whisker plots showing the grade distributions in the zones

The data show the channel sample assays for the four main oxides, divided into each zone. The diagrams show that there is a distinction between the zones, despite a significant amount of overlap. The horizontal blue line and number indicate the middle between quartile boxes of Zones B and C. Averages for each channel in Zone B lie above this line, while averages for Zone C lie below. The same is true for most of the averaged NGU grab samples (averaged by location).

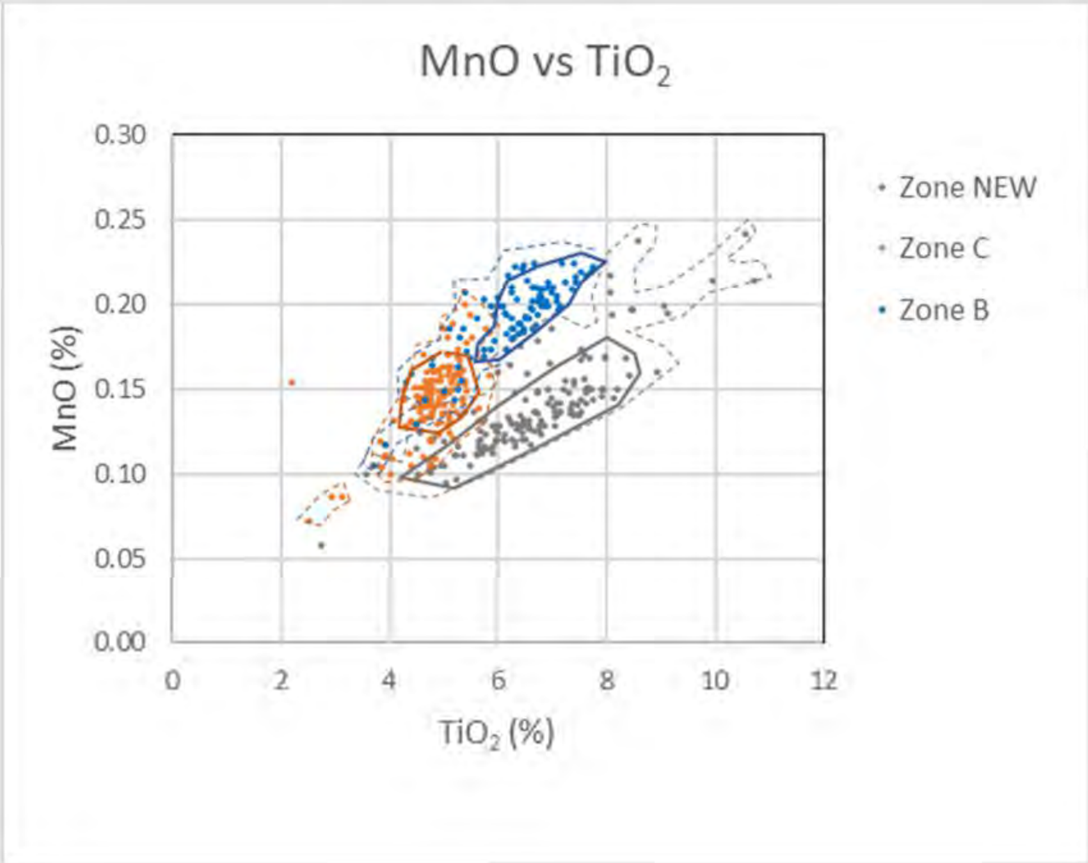
Another way to use chemistry to distinguish the different zones is by plotting different elements against each other in correlation plots (Figure 4-4). Of many possible combinations, it was found that plots of MnO versus TiO_2 and of Na_2O versus TiO_2 show the clearest separation of data between the three zones. MnO content is highest in the mafic (dark) rocks, while Na_2O (or Al_2O_3) will be highest in the felsic (light) rocks.

The data in these plots form three well defined clusters, with some overlap between Zones B and C, whereas NEW Zone rocks stand clearly apart in a different trend. The Zone B and C samples lie approximately on a common trend, but with separate clusters.

An important conclusion of this comparison is that, as well as distinct clustering for each zone, there is a large spread of compositions within each zone. This is particularly so for NEW Zone, whereas the more tightly clustered data from Zone C suggest a more consistent composition.

In Figure 4-5, three channels were selected to emphasise that composition varies along strike in the zones. Samples from channel 15 lie outside the main trend of Zone B (and Zone C) in the MnO-TiO_2 plot but have a reasonable fit with Zone B in the Na_2O-TiO_2 plot. The samples of channels 9 and 16 (NEW Zone), each occurring in the top part of the stratigraphic zone MCU III-d, show compositions in the MnO-TiO_2 plot that are shifted towards Zone B. Several other such relationships can be observed and can help in understanding the full development of the mineralisation as part of future geological interpretation.

Chapter 5 discusses how, with the help of these plots, the compositions of NGU samples can be evaluated to increase the understanding of the distribution of the mineralised zones in the wider area.



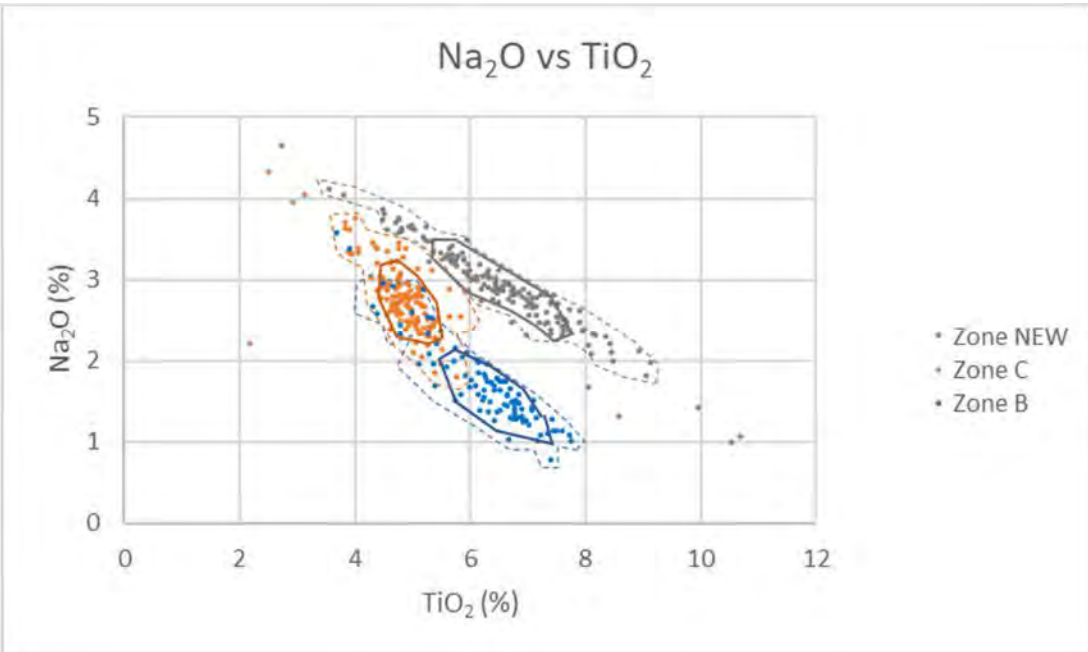


Figure 4-4 Plotted grades of channel samples as MnO and Na_2O versus TiO_2

All channel sample data are plotted, clearly showing the formation of three clusters for Zones B, C and NEW. The hand-drawn full and dashed lines in grey, orange and blue indicate the densest cluster and most of the datapoints (without outliers) of Zones NEW, C and B respectively.

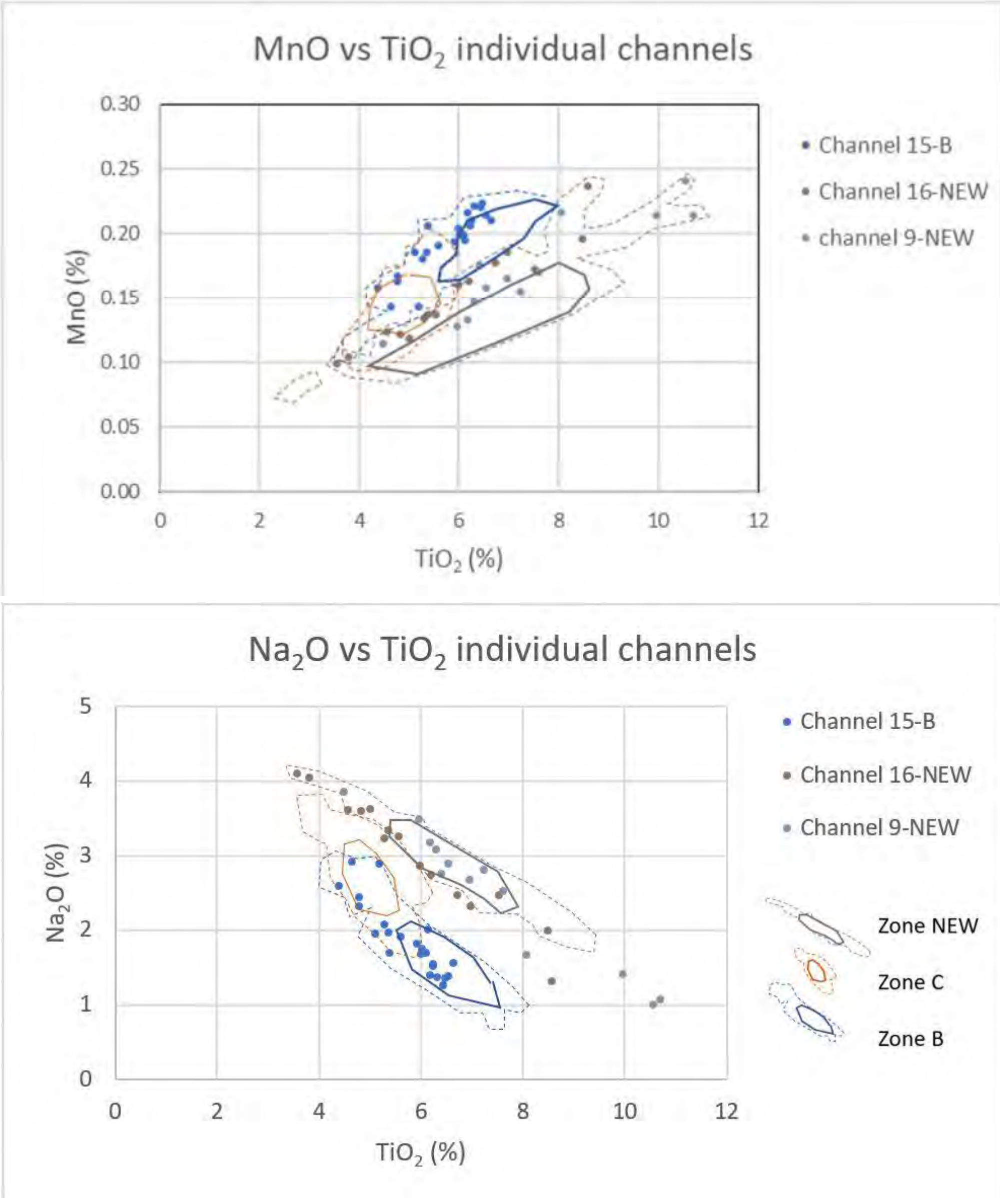


Figure 4-5 Plots of MnO and Na_2O vs TiO_2 for zone selected sample channels

The areas outlined in grey, orange and blue are the fields determined from the full set of channel sample data as shown in Figure 4-4.

4.2.1 New Interpretation of the Bilstadvatnet area

In SRK's CPR of 2018 the suggestion was made that around Bilstadvatnet (the lake immediately east of Lake Teksevatnet), the distribution of geological units, and therefore the location of the mineralised zones, could be different to that indicated by NGU maps. This observation is now supported by the channel sample data which suggest that channel 15, located in NGU's Zone C, has a chemistry that is more like Zone B. This calls for a re-evaluation of the situation around Bilstadvatnet. The implication of this is that Zone B, which appears to have more economic potential than the other zones, has a substantial eastward extension beyond the limit shown on existing maps. In the following chapter, this new interpretation is discussed in more detail, using NGU grab sample and drill core data to substantiate the new interpretation by SRK.

It should be noted that a preliminary release of the newest aeromagnetic data, acquired in

September-October of 2019, indicates that the situation between the two lakes, Teksevatnet and Bilstadvatnet may diverge slightly from this interpretation and closer examination of the final magnetic data is required, once it is available. This will not significantly affect the extent of mineralised zones in the area.

5 COMPARISON OF SRK CHANNEL SAMPLE DATA WITH NGU GRAB SAMPLE DATA

One of the main purposes of this phase of exploration was to test the data and conclusions published by NGU (Korneliussen et al., 2001; Schiellerup et al., 2001; Meyer et al., 2002; Boyd et al., 2012a, b; Ihlen et al., 2014), assessing whether they were valid and provide a representative view of the area's mineral potential. These reports include chemical data of 314 grab samples of rocks in the Bjerkreim lobe of the Bjerkreim-Sokndal layered intrusion. Based on these data and on geological mapping, the NGU defined their model of mineralised zones A, B and C and calculated a volume of mineralised rocks (Table 5-1).

Table 5-1 Dimensions of mineralised zones in the Bjerkreim area (Korneliussen, 2012)[1]

				Dimensions (distances in metre)				Mineral composition**	
Deposit	Zone	Unit	Length	Width*	Area	Depth	Mt	MgO% in ilm	V_2O_3% in mag
Åsen	A	MCU IB	2000	50	100 000	100	29	2.0 %	0.9 %
Helleland	B SW	MCU III	2000	130	260 000	100	75	2.1 %	1.0 %
Terland	B NE	MCU III	4000	120	480 000	100	139	2.5 %	0.9 %
Lauvneset	C		12000	90	1 080 000	100	313	1.5 %	0.8 %
				Sum:	1 920 000	m^2	557	million metric tons	

** The width presented here is that at the named section (deposit column);*

*** Mineral compositions represent the named sections, not the whole length of the zone. These two columns are reversed in the publication, i.e. they have the wrong headings there.*

This chapter compares SRK's channel sample data with the historical NGU grab sample data where it occurs close to the channels. In Section 6, the new data are combined with some basic mapping and reconnaissance work and evaluated in terms of the extents of the mineralised zones.

The channel sampling focussed on the central part of the area, west and east of Lake Teksevatnet. As Zone A does not occur in this part of the area, only Zone B and Zone C are tested against NGU data. A few NGU grab sample data from NEW Zone are also available to be compared.

In Table 5-2, the channel sample data are compared with NGU grab sample data from the same locations. NGU equivalents are not available for all the channels. Only the three economic elements (P, Ti and V) are included in the comparison, and only NGU grab samples that were collected in the vicinity of the channel sampled section are considered. An exception for this is

[1] The tonnage represented in this table is NGU's interpretation of the geological potential and conservatively assumes a depth continuation of 100 m. Lateral dimensions are based on assumptions of continuity along strike (sometimes for several km) and across stratigraphy through areas with no outcrop, and grades are based on chip sampling. This does not represent a mineral resource in compliance with any international reporting code.

samples in Zone C, for which only one single NGU grab sample was taken close to a channel. Therefore, several samples collected at a larger distance to the channel were included in the comparison. In Appendix A and Figure 4-2 the NGU grab sample assay results are plotted together with the channel sample data for a more detailed comparison. In Section 5.2, NGU data from several other locations that were not channel-sampled is also reviewed and compared.

The majority of the NGU samples used in this comparison are described by Schiellerup et al. (2001) and are mostly from rocks with either a felsic (noritic) composition or a mafic (gabbroic) composition. In a few instances they included both felsic and mafic components. The mafic bands are commonly enriched in the three elements of interest. Sample chemistry data from Korneliussen et al. (2001) do not include vanadium (or other trace elements) and these samples are not described in Korneliussen's publication. Because the NGU samples are grabs, they represent the grade of a single location and do not represent the average composition of a section through a mineralised zone. In SRK's experience, grab sampling often reports higher grades than a representative sample (drilling/channel) of the same mineralised package. This is due to the inherent bias in its collection; for example, e.g. geologists may only sample visible mineralisation with no internal dilution accounted for. By contrast, the weighted average calculations of the channel samples do give a true average of a section through the sampled part of a zone.

Table 5-2 Comparison of SRK channel sample data with NGU grab sample data

SRK Data						NGU Data				
Channel	Zone	No. Sample	P_2O_5 (%)	TiO_2 (%)	V_2O_5 (ppm)	P_2O_5 (%)	TiO_2 (%)	V_2O_5 (ppm)	No. Sample	Location
10-11	B	48	4.14	6.42	1128	3.14	5.61	644	17	Øygrei C
14	B	25	4.14	6.54	1145					
15	B	23	4.19	5.72	858	3.72	6.18	653	9	
1	C	43	2.93	4.62	691	3.73	5.23		5	Øygrei S & SW
2-3	C	58	3.45	4.86	737					
20-21	C	44	3.32	4.93	829	4.29	5.38		2	
4+5+6	NEW	34	0.11	5.98	781					
7-9+12-13	NEW	43	0.11	7.17	931	0.12	7.74	479	5	Øygrei NE
16	NEW	15	0.09	5.74	816					
17-19	NEW	65	0.08	6.74	895					

The data represent averages for each of the sections through the mineralised zone. Those grades that are highest in the comparison are highlighted with a slightly darker background colour.

There is generally a fair agreement of the two datasets, but in detail there are some differences. This is most obvious in the vanadium grades: these are significantly higher in the channel samples.

As described in Section 4.2 and Figure 4-4, the channel sample data give a clear distinction in grade between the three zones. That same pattern is not obvious in the NGU data, at least not for Zones B and C. In the NGU samples there is not much difference in TiO_2 grade between Zones B and C, while the grade in NEW Zone is distinctly higher. And in contrast to the channel samples, the P_2O_5 grades in the NGU samples are slightly higher in Zone C than in Zone B.

5.1 Comparison by mineralised zone

5.1.1 Zone B

There are only NGU samples for comparison at Øygrei C (channels 10+11) and Lauvneset (channel 15). P_2O_5 grades in the channel samples are slightly higher and TiO_2 grades in are slightly lower than in corresponding grab samples. V_2O_5 grades are significantly higher in the channel samples.

5.1.2 Zone C

Only one of the NGU samples was collected at a channel sample site at Øygrei S (at the lake shore). The four other samples used for comparison to channel 01 were collected between 40-150 m distance from the channel. The two samples used for comparison to channels 20 and 21 were collected 300 m to the SE of the channel location. None of these NGU samples include data for vanadium.

The grades in the channel samples are slightly below the grades in the NGU grab samples. P_2O_5 is 0.3% to 1% lower in the channel samples, TiO_2 is 0.4% to 0.6% lower.

5.1.3 NEW Zone

NGU sample data are available for channel sampled locations in only the Øygrei NE are. Although these samples lack apatite, they were not specifically noted by NGU as being of a different stratigraphic level and were marked as being part of Zone B (MCU-IIIe) by NGU. In the present comparison they are interpreted as being of NEW Zone.

The channel samples from Øygrei NE (channels 7-9, 12 and 13) have the highest grades of all four channel sampled sections in NEW Zone. Despite that, the TiO_2 grade is 0.6% lower than the grab samples from the same area. In the detailed description and the plots therein (Section A4, Figure A7, Figure 4-2), it is obvious that in the northern, stratigraphically lower part of the section (channels 7, 8 and 12) the TiO_2 grades of the two NGU samples are about 4% higher than the channel samples, while in the southern, higher part of the stratigraphy (channels 13 and 9), the TiO_2 grades of the channel samples are up to about 6% higher than in the three NGU samples.

The V_2O_5 grades in the channel samples are higher than in the NGU samples, especially in the southern part of the section where grades are up to 500 ppm higher.

5.1.4 Differences in Vanadium Grades

The consistently higher vanadium grades of the channel samples imply that the difference could relate to the type of analysis or a problem with analysis. Both the channel samples and NGU samples were analysed by XRF, but while the exact specifications of the method used to analyse the channel samples is known (ALS method ME-XRF21), the same cannot be said for the NGU analyses.

Importantly, SRK has confidence in the grades for the channel samples because these are supported by a robust QAQC programme that shows the ALS laboratory to be reporting vanadium grades accurately. This implies that the NGU may have underestimated the vanadium grades for this project.

It should, however, be noted that vanadium grades from NGU drill core samples fit very well with the average channel sample grades (see Section 5.2). has yet been found

5.1.5 Sample Bias

Whereas the channel samples include every part of the section that is exposed and can be cut with a rock saw, the grab samples only collect a small part of the rock at selected points, usually either a mafic or felsic part. This automatically gives a bias in the NGU sample set. It is clear from Table 5-2 that where few grab samples were collected (most of the Øygrei locations), their average grade is higher than that of the channel samples, whereas those locations where more grab samples were collected (Øygrei C, channels 10+11, and to some extent Lauvneset, channel 15), their average grade is lower than or almost equal to that of the channel samples. This implies that where few samples were collected, mafic, higher grade rock was favoured, while where many samples were collected a more representative collection was made.

5.1.6 Summary and conclusion

There is a fair similarity in grades when comparing SRK channel samples with NGU grab samples, with the exception of the vanadium grades which are considerably higher in the channel samples and are believed to be more accurate. Channel sample results from Zone B, the zone with the highest percentage of value minerals, are slightly better in terms of phosphorous and titanium grades, and significantly better in terms of vanadium, compared to the NGU samples. Grades in Zone C are slightly lower than in the NGU grab samples, but this is believed to be due to high-grade sampling bias in the NGU data.

The main conclusion can be made that the NGU grab sample data are overall a reasonable representation of the titanium and phosphorous grades in the mineralised zones, while they significantly under-estimate the vanadium grades. Only the grades of Zone C are over-estimated by the NGU samples by c. 0.3 - 1 % (excluding vanadium).

5.2 Comparison with Other NGU Samples

Table 5-3 contains the summarised chemical data of 107 NGU grab samples and 29 core samples from two drill holes that were collected in areas more distant to SRK's channel samples. This section seeks to evaluate if the data can be used to identify the presence of each mineralised zone in the wider area of the exploration licences; an important purpose is to provide a base for the evaluation of the continuity of the mineralised zones east of Teksevatnet where there is uncertainty regarding the positions of the zones.

These data are taken from the NGU reports by Korneliussen et al. (2001) and Schiellerup et al. (2001). They represent a large part of the NGU grab sampling of the mineralised zones between Helleland in the western side of the Bjerkreim lobe and Ollestad in the east. This investigation only uses data from samples that represent one of the mineralised zones and show clearly elevated grades of TiO_2, V_2O_5 and (in Zones B and C) also P_2O_5. Where lower grade samples occur within a series of mineralised rocks, these were also included.

Furthermore, the data from the two drill holes in the east of the area (Mjåsund and Ollestad; MJ and OL in Figure 6-3) are included (kindly provided by H. Schiellerup 2019). In contrast to the NGU grab samples, the drill hole data represent continuous sections through the stratigraphy and are more comparable to the channel sample data, representing a true average composition over the intersected rock sequence. In the Mjåsund drill hole only 10 m of the stratigraphy was sampled, while 28 m true thickness of the stratigraphy was sampled in the Ollestad drill hole.

It should be noted that vanadium cannot be used for the designation of the grab samples into the different zones, as classified by channel sample compositions, because 1) many of the NGU samples do not have vanadium grades, particularly in Zone C and NEW Zone, and 2) the vanadium grades of the NGU grab samples are systematically lower than those of the channel samples.

The data are divided according to the mineralised zones they occur in (but see discussion below) and subsequently split up according to their position east or west of Lake Teksevatnet.

The same dataset is plotted in Figure 5-2, where the NGU data are compared with the SRK channel sample data in MnO and Na_2O versus TiO_2 plots. These plots are used to test to what extent the chemistry of the NGU samples fits in the chemical subdivision of Zones B, C and

NEW. Originally, an attempt was made to plot single NGU sample compositions, but as these represent rather specific felsic or mafic compositions, they plot mainly out of the fields defined by the more representative average compositions shown in the channel sampling data.

Table 5-4 is a list of the acronyms and location names used in the text, figures and tables.

Table 5-3 Overview of selected NGU grab sample data

Location	ZONE	No. of samples	SiO2 (%)	Fe2O3 (%)	TiO2 (%)	MgO (%)	Na2O (%)	K2O (%)	MnO (%)	P2O5 (%)	V2O5 (ppm)	W/E of lake
Helleland road cut	B	12	37.26	21.82	6.62	8.89	1.71	0.29	0.16	3.46	830	W
Terland	B	8	39.44	20.01	5.83	8.31	2.16	0.34	0.15	3.34	728	W
Øygrei C	B	17	40.47	19.76	5.61	8.79	2.12	0.40	0.16	3.14	639	W
Lauvneset	B?	9	38.50	21.11	6.18	9.16	1.79	0.38	0.18	3.72	653	E
Bilstadvatnet SW	B	8	37.80	21.68	6.62	10.28	1.50	0.29	0.18	3.79	728	E
Storaneset (Bilstadv. NE)	B	8	35.95	25.38	7.57	12.57	0.97	0.15	0.20	3.27	775	E
Mjåsund drill hole	B	14*	35.18	23.66	6.75	9.91	1.34	0.23	0.19	4.13	1096	E
Vasshusvika 3e	B	6	36.90	21.46	6.36	9.08	1.53	0.41	0.17	3.83	503	E
Melhus S	C	2	39.17	18.95	5.38	9.47	2.06	0.29	0.16	4.29		W
Øygrei S	C	5	39.89	19.49	5.23	8.82	2.07	0.37	0.17	3.73		W
Teksevatnet south a	C	5	39.06	19.20	5.36	8.20	2.07	0.41	0.16	4.30		
Ollestad	C	8	40.54	17.01	4.90	6.44	2.70	0.50	0.14	3.84		E
Ollestad drill hole	C	15*	40.94	17.32	4.52	7.88	2.48	0.48	0.15	3.56	701	E
Øygrei NE	NEW	5	43.81	18.78	7.74	8.59	2.64	0.46	0.13	0.12	479	W
Teksevatnet south b	NEW	3	44.30	17.70	6.97	9.37	2.54	0.47	0.13	0.32		
Vasshusvika 3d	NEW	9	46.17	15.08	5.68	6.48	3.25	0.63	0.11	0.14		E

The data are averages of groups of samples from several locations mainly in the northern and eastern parts of the project area. 'W/E of lake' refers to their location west or east of Lake Teksevatnet. All samples are grab samples, except the samples from the two drill holes at Mjåsund and Ollestad, for which the number of samples is marked with an asterisk (*).

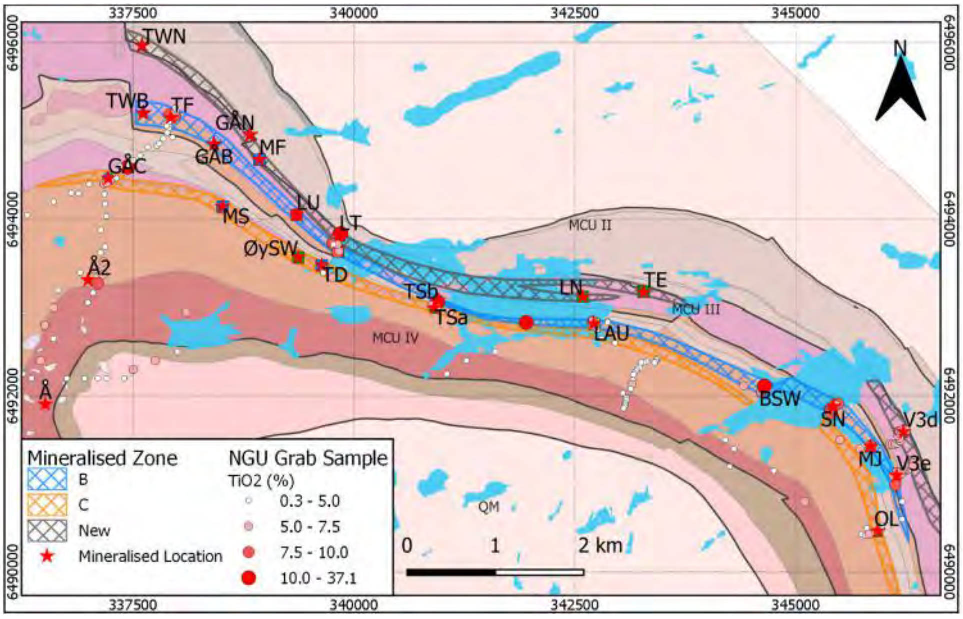


Figure 5-1 Location names and NGU grab sample locations in the northern area

Red stars and acronyms mark the locations that are referred to in the text. Red and pink dots are NGU grab samples coded with TiO2 grade. Plotted on the geological map, legend as in Figure 2-1.

Table 5-4 Acronyms and location names used in the text

Acronym	location	comment	Acronym	location	comment
Å	Årestad south	location south of the E39 near Årestad	MI2	Magnetite-Ilmenite loc 2	high grade single outcrop
Å2	Årestad		MJ	Mjåsund	Drill hole location
BSW	Lake Bilstadvatnet West	sample location on the west shore	MS	Melhus S	Close to H. Øygreid farm, ch 20-21
GÅB	Gyaåna Zone B	Where Zone B intersects the road	N?	Birkeland	potential continuation of NEW Zone
GÅC	Gyaåna Zone C	Where Zone C intersects the road	OL	Ollestad	Drill hole location
GÅN	Gyaåna NEW Zone	Where NEW Zone intersects the road	SK	Storeknuten	
GR	Grøning		SN	Storaneset	Peninsula in NE Bilstadvatnet
H	Hellestad	location of the road section	TD	Teksestemmet	Dam in SW Teksevatnet, Øygreid S, ch 1
HO	Hogstad		TE	Tekse East	
LAU	Lauvneset	Peninsula in Taksevatnet east - ch 15	TF	Terland Farm	
LN	Langneset	Peninsula in Taksevatnet east - ch 16	TS	Teksevatnet South	South shore of the lake
LT	Lake Teksevatnet	Northwest corner of the lake ch 9-13	TW	Terland West	
LU	Lusiknuten	Hill about 150 m NW of ch 14 - in forest	V3d	Lake Vashussvika NE	in MCU III-d
MF	Melhus Farm	Also referred to as Melhus N, ch 4-6	V3e	Lake Vashussvika SE	in MCU III-e
MI1	Magnetite-Ilmenite loc 1	high grade single outcrop			

The subdivision of the sample groups from east of Teksevatnet into Zones B or C in Table 5-3 is mainly based on where they plot in Figure 5-2 and where the sample locations occur in the geological map. The sample groups with low phosphorous are attributed to NEW Zone. This fits with NGU mapping in the case of the samples from Øygrei NE at the western shore of Lake Teksevatnet and for samples from northeast of Lake Vasshusvika (marked V3d in Figure 5-1) that were collected in the stratigraphic level below Zone B.

The group of three samples from the southern shore of Lake Teksevatnet (Teksevatnet south b) with low phosphorous lie outside the NGU's defined mineralised zones. Their average chemical composition, especially high Ti and low Ca, fits NEW Zone in all aspects (compare Table 5-3 with Figure 4-3 and Figure 5-2).

There are several critical observations that can be made in the table and the plots:

1) The grades of the drill hole data fit quite well with the chemical characteristics of Zones B and C, plotting well in the fields of Zones B and C respectively (Figure 5-2). This supports the new interpretation that both Zones B and C are present east of Lake Teksevatnet, in contrast to the NGU's geological mapping that only recognizes Zone C east of the lake;
    a. As an aside, the vanadium grades of the drill hole samples are very close to those of the channel samples in the corresponding zones. The reasons for this are not yet known;
2) NGU designated all mineralised rocks from east of Lake Teksevatnet as Zone C. Except for the samples from Ollestad (OL in Figure 5-1) and the drill hole here, all other samples from east of the lake have a chemistry that is similar to that of Zone B (Figure 5-2). The Ollestad samples plot well within the Zone C cluster;
3) Fe_2O_3 and TiO_2 grades in Table 5-3 agree well with the boundaries set for the three mineralised zones in Figure 4-3 (19.3% Fe_2O_3 and 5.5% TiO_2) with the exception of the sample group from Øygrei S (Zone C, TD in Figure 5-1), which has slightly too high Fe_2O_3. The opposite is the case for the P_2O_5 grades of sample groups from Zones B and C. In Zone B samples, only two out of eight locations show grades that are above the boundary of 3.8% P_2O_5 set in Figure 4-3, while in Zone C only two out of five samples are below that boundary. TiO_2 is therefore a more reliable discriminator for Zones B and C using grab samples;
    a. Like the vanadium grades, it should be noted that the averages of the drill hole

samples have “the appropriate” P_2O_5 grades that agree with the distinction based on the channel samples;

4) There is a clear distinction (but not a big difference) in the chemistry of Zone B west and east of Lake Teksevatnet, plotted with blue squares and green triangles respectively in Figure 5-2. There are fewer datapoints for Zone C, but the difference between west and east of the lake is much less clear;

5) The data for grab samples from Zones B and C west of Lake Teksevatnet (orange and blue symbols) show an inconsistent pattern with indications that the chemistry of the B and C zone samples may overlap in this area. These samples were collected where the mineralised zones are well defined in the geological map and confirmed by channel sample data. Except for the samples from Helleland (H in Figure 5-1), all grab samples from Zones B and C plot very close to each other near the transition from Zones B to C. In the MnO vs. TiO_2 plot, all Zone B and C grab samples from west of the lake plot in or close to the Zone C cluster, but within the overlap of Zone B channel samples. In the Na_2O vs. TiO_2 plot they all lie within, or close to, the Zone B cluster, but within the overlap of the Zone C channel samples.

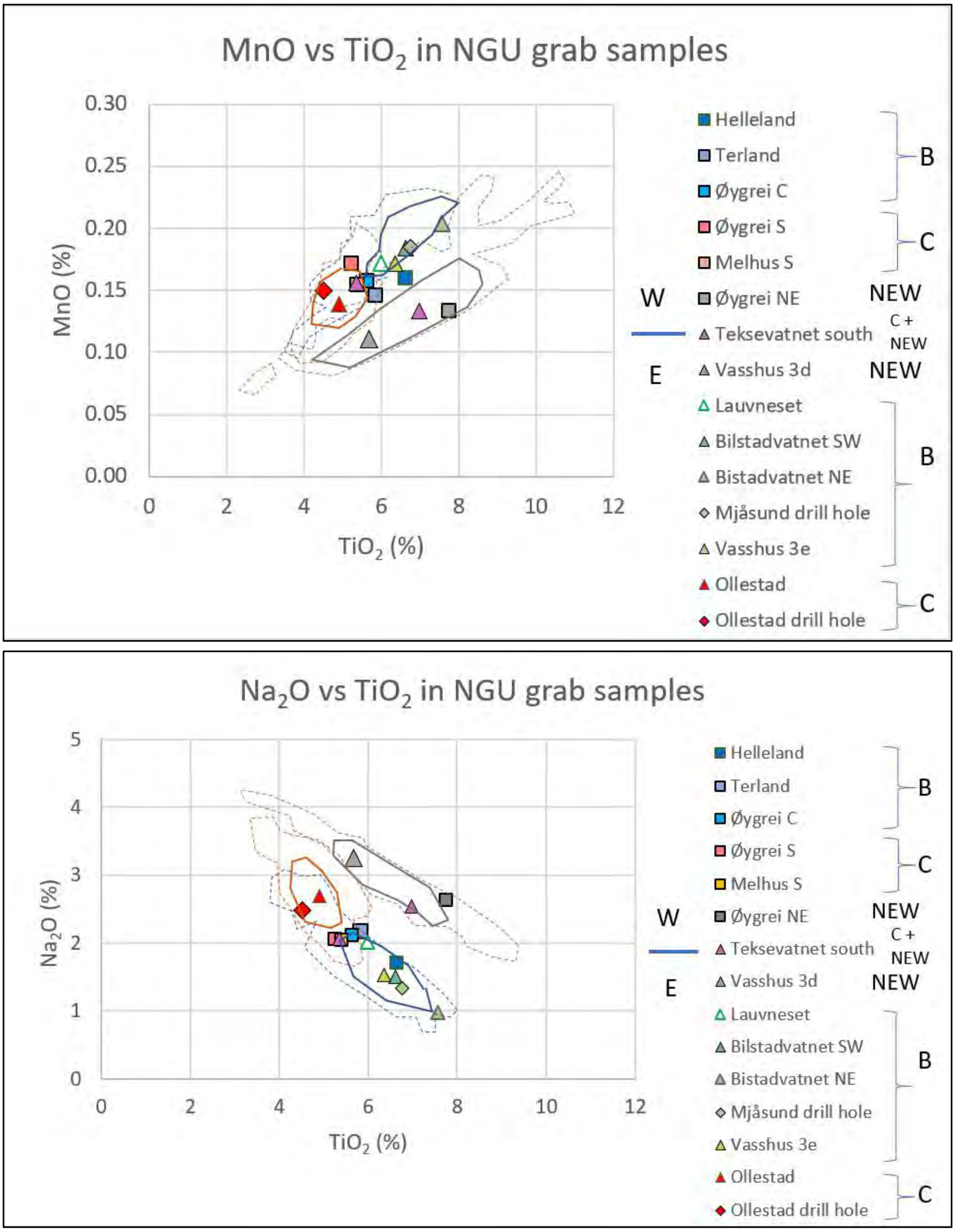


Figure 5-2 MnO and Na_2O versus TiO_2 plots of NGU grab samples

The plots include the same averaged data as Table 5-3. These plots were used to subdivide the data into different mineralised zones in the table. The areas indicated in grey, orange and blue are the same as in Figure 4-4. 'E' and 'W' refer to sample locations either east or west of Lake Teksevatnet. In both plots the datapoint for the Melhus S sample group is obscured by the datapoint for Teksevatnet S in the Zone B cluster.

These data show that the chemistry of the grab samples is in many cases inconsistent with the channel samples in terms of chemical differentiation of the mineralised zones. However, based on iron and titanium content alone, Zones B and C appear to be distinct, while the phosphorous and calcium grades differentiate the NEW Zone samples from Zones B and C.

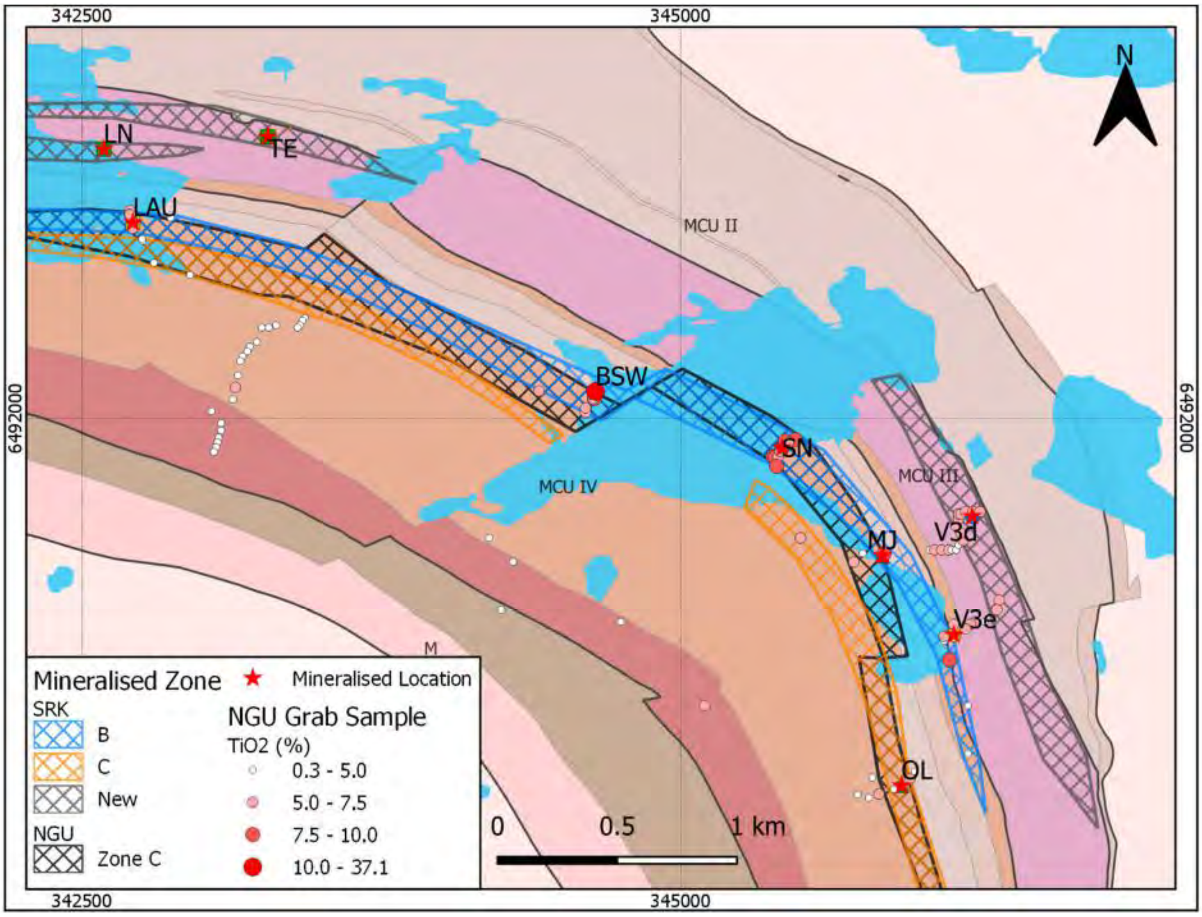


Figure 5-3 Comparison of NGU's and SRK's zone definitions east of Lake Teksevatnet

Red stars and acronyms mark the locations that are referred to in the text. Red and pink dots are NGU grab samples coded with TiO_2 grade. The zones as defined by SRK are not mapped in the field and may be slightly inaccurate. Plotted on the geological map, legend as in Figure 2-1.

5.2.1 Summary and New Interpretation

This section attempts to use NGU grab sample chemistry in a comparison with the SRK channel sample chemistry to differentiate between the three mineralised zones in areas where channel sampling was not carried out. This leads to a disagreement with the NGU interpretation of the mineralised zone east of Lake Teksevatnet: SRK believes that most of this is Zone B rather than Zone C. In contrast, the data from two shallow NGU drill holes fit very well with the chemistry of the channel samples and suggest that both zones Band C are present in the eastern part of the area..

The main conclusions from this comparison exercise are that:

1) The chemistry of the NGU samples indicate a distinct difference between the mineralised zones east and west of Lake Teksevatnet;

2) The data indicate that most of the samples from east of Lake Teksevatnet have a chemistry that is similar to that of Zone B channel samples, with the exception of the samples from Ollestad; and

3) The data indicate that east of Lake Teksevatnet rocks of a composition similar to channel samples of Zones B, C and NEW occur. That would indicate that all three mineralised zones are present, not only zone C, as in NGU's model.

This last conclusion could have major implications for the volume of mineralised rocks in this part of the area and needs further investigation. It is expected that the new aeromagnetic data that are being processed at the time of writing can provide important information on the potential continuity of the mineralised zones.

6 RECONNAISSANCE AND INTERPRETATION IN THE WIDER AREA

During and after the channel sampling, SRK spent about 10 days undertaking reconnaissance work in areas close to where the channel samples were being collected as well as more distant areas. Information from other short field trips in March and September 2019 are included in this report. SRK's observations were entered in a GIS system and combined with channel sample data, NGU data (mapping and grab sample chemistry), and aeromagnetic maps (the relatively low-resolution data that was acquired by NMP before the onset of fieldwork).

The reconnaissance work had several purposes. Initially it was restricted to the main area of interest and directed at improving the understanding of the geology and to find locations suitable for channel sampling. Later, the objective was to extend the known zones of mineralisation, especially in the southern part of the licence area, and to find new mineralised zones. The reconnaissance work was in part guided by the existing aeromagnetic map.

A detailed description of the results and methodology of the reconnaissance and GIS work is presented in Appendix B. Each of the mineralised zones is described, starting at a well-defined point west of Lake Teksevatnet where most of the channels sampling took place, and traced from there first to the west and south, and subsequently from Lake Teksevatnet to the east. Grades of the zones from pXRF analyses and NGU grab samples are reported in Appendix B.

Figure 6-1 shows the new extents of the mineralised zones as proposed by SRK following this reconnaissance, and the locations that are referred to in the text. NEW Zone, being the stratigraphically lowest, is the first to be discussed. Thereafter, the stratigraphically higher Zones B and C.

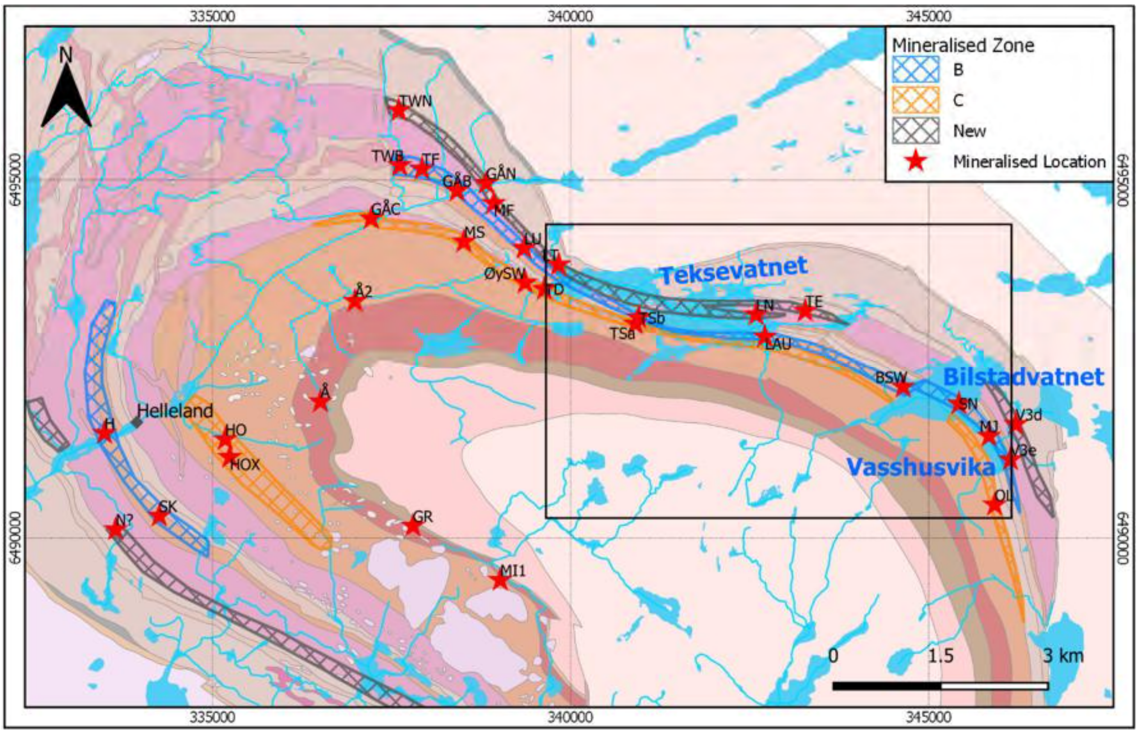


Figure 6-1 New interpretation of mineralized zones and locations referred to in the text

Red stars mark the locations that are referred to in the text, named with acronyms. Plotted on the geological map, legend as in Figure 2-1. The black square marks the position of the map in Figure 6-3.

6.1 NEW Zone

NEW Zone, or rocks with characteristic composition and appearance of this zone, have been recognised from Terland in the west to Tekse East in the east (TW and TE in Figure 6-1), a distance of 6 km, with 2.3 km not exposed due to Lake Teksevatnet.

Additionally, NGU samples east of Vasshusvika (V3d in Figure 6-1) suggest that the same stratigraphic level that hosts NEW Zone further west, is mineralised in the east as well. NEW Zone continues thus into the eastern part of the intrusion, extending for another 3 km, but with slightly lower Ti grades.

At Helleland (H in Figure 6-1), 6 km west of Terland (measured along the fold hinge), NEW Zone has again been recognised in outcrops along the E39 road and to its north. In the geological map, the stratigraphic zone that hosts NEW Zone (MCU-IIId) is continuous through the fold hinge, as opposed to Zone B which shows a large gap between Terland and Helleland. The mineralisation in NEW Zone may well be continuous through the fold hinge, although it is disturbed by the Jotunitic dyke that intrudes this area. This needs confirmation which, in part, may be obtained from the newly acquired magnetic data and from reconnaissance in the field.

Starting from about 1.4 km south of the road outcrop at Helleland, a strong linear magnetic anomaly at the stratigraphic level of NEW Zone could indicate that NEW Zone continues here. The anomaly can be traced at this stratigraphic level for 6 km south-eastwards from Birkeland (marked with N? in Figure 6-1). This needs to be confirmed in the field.

Although NEW Zone appears to be continuous over many kilometres, the character of the zone changes along strike. Apart from at Tekse East, the zone is observed as several narrow zones (5-50 m wide) of banded rocks that are interlayered with more homogeneous and lower-grade rocks, together forming a mineralised zone of up to 110 m wide, possibly even up to 200 m at

Vasshusvika.

These changes in width occur over relatively short distances. For example, at Langenes (east side of Teksevatnet, LN in Figure 6-1) the banded rocks occupy 20-30% of the whole zone, but at Tekse East, only 500 m further east, the banded rocks occupy almost 100% of the 100 m wide zone.

East of Vasshusvika, in the easternmost part of the intrusion, 9 NGU grab samples from the lowest part of stratigraphic layer MCU III-3d are closely spaced and suggest a homogeneous mineralised zone of 150 m width and with NEW Zone characteristics (see Section 5.2).The mineralisation in this location has not yet been confirmed by SRK.

SRK's observations of the rocks in NEW Zone suggest a dynamic intrusive environment. Troughs, slump folds and erosive surfaces occur regularly and evidence a high energy environment, probably because intrusion occurred in a tectonically active period. Such an environment is favourable for creating deposits of heavy, dark minerals (e.g. ilmenite and magnetite) in low energy pockets. Lenses of high-grade rocks could be expected at both small (Figure 6-2) and large scales.

Figure 6-2 Formation of troughs with enriched heavy minerals at Tekse East

The stratigraphic horizon UMC IVd is equivalent to that of NEW Zone and could have potential for similar mineralisation. The area west of Teksevatnet where this occurs is well investigated and does not have such mineralisation. South of Gyaåna at Helleland, however, one NGU grab sample with 5.1% TiO_2 (low P_2O_5) from between Zones B and C and an aeromagnetic linear anomaly at this stratigraphic level indicate that this area needs to be investigated. This potential target is very uncertain and has not been shown in the maps.

6.2 Zone B

Zone B consists of two parts: Zone B West in the southern part of the fold-hinge and Zone B

East in the northern limb of the trough. Most of SRK's work has been carried out in Zone B East which appears to be semi-continuous from Terland in the west to Lake Vasshusvika in the east (TW and V3e in Figure 6-1) and has the highest grades of all three target mineralised zones (Figure 4-1). Its character changes frequently along strike, both in appearance (width and rock type) and chemistry, but a distinct chemical fingerprint can be recognised through most of the length of the zone (Section 4.2). A c. 1 km long lower-grade gap occurs between Terland Farm and Lusiknuten, the site of channel sample 14 (respectively TF and LU in Figure 6-1).

At Terland Farm in the west, Zone B forms a 120-200 m wide zone of banded rocks with a high proportion of mafic and intermediate layers, but at Gyaåna (GÅB in Figure 6-1) it has changed to a 90 m wide zone that is more homogeneous, more felsic and of lower grade than at Terland Farm and at Øygrei+Lake Teksevatnet (respectively TF and LU+LT in Figure 6-1). The chemistry at Gyaåna is different to the remainder of Zone B in that P_2O_5 occurs at a higher concentration than TiO_2. South of Gyaåna the zone is not observed at surface for about 800 m after which it crops out again at Lusiknuten as a >90 m wide, well-defined banded zone with some of the highest grades in the area (site of channel sample 14, Øygrei NW). At the western shore of Lake Teksevatnet, the 100 m wide zone is split in two, separated by a c. 45 m wide lower-grade unit.

At Lauvneset on the eastern shore of Lake Teksevatnet (LAU in Figure 6-3), the mineralised zone that SRK has re-interpreted to be Zone B is more mafic and higher grade (in P, Ti and V) than west of the lake. East of Lauvneset, NGU observations and grab samples of mineralised rocks occur at fairly regular spacings, suggesting there is a certain continuity of the zone. This gives Zone B east of Teksevatnet a strike length of 4.5 km. These rocks east of the lake were originally interpreted as Zone C by the NGU and therefore this new interpretation does not add directly to the total length of the mineralised units but if Zone C is also present, parallel to this occurrence of Zone B, it could add to the total volume of mineralised rocks. Further work is required because the width of Zone B is poorly constrained here and there is little exposure where Zone C should be found southwest of Zone B.

The drill core samples from Mjåsund and the mineralised grab samples from southeast of Lake Vasshusvika (respectively MJ and V3e Figure 6-3) have a Zone B chemical character and confirm that Zone B continues here. Further south, there are not yet any indications for the continuation of Zone B except that the strong magnetic anomaly that is associated with both Zones B and C in the northern fold limb continues for 4 km further south of Ollestad (OL in Figure 6-3).

As mentioned previously, the preliminary data of the new helicopter-borne magnetic survey indicate that the interpretation between Lakes Teksevatnet and Bilstadvatnet may need further revision, but it does confirm the new interpretation of the zones southeast of Bilstadvatnet. The data suggests that all three mineralised zones are present southeast of Lake Teksevatnet.

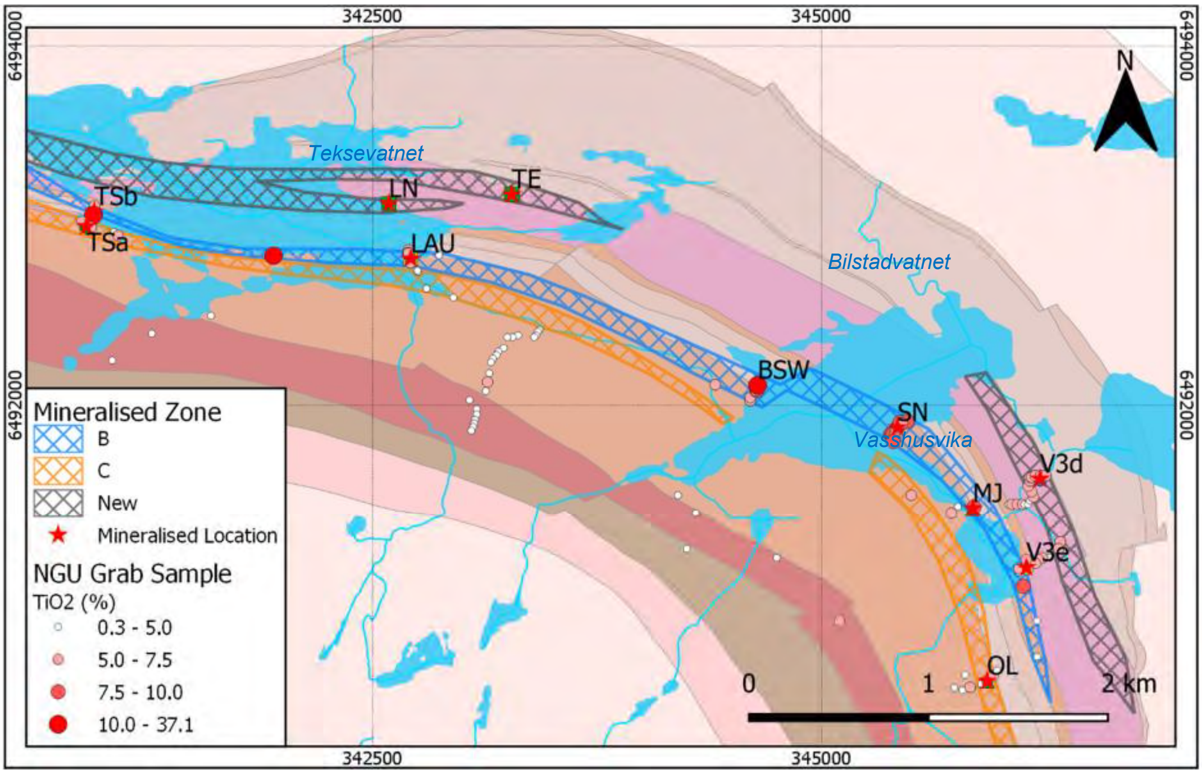


Figure 6-3 Location names and new interpretation of mineralised zones in the eastern area

Red stars and acronyms mark the locations that are referred to in the text. Red and pink dots are NGU grab samples coded with TiO_2 grade. Plotted on the geological map, legend as in Figure 2-1.

Zone B West, south of the fold hinge, runs southwards from Helleland (H in Figure 6-1) to south of Storeknuten (SK in Figure 6-1). This extension adds 1.2 km to the length of the mineralisation compared to the NGU model. Further to the southeast, no significant mineralisation has yet been recognised at this stratigraphic level during reconnaissance.

6.3 Zone C

Zone C is now recognised through most of the intrusion at the stratigraphic level MCU IV-e, apart from in the fold hinge area. Therefore, it can also be divided in a Zone C West south of the hinge zone and Zone C East in the northern limb. The latter is best understood and is rather well exposed from Gyaåna in the west to Øygrei S at Lake Teksevatnet (respectively GÅC and TD in Figure 6-1).

The mineral grades are lower and more consistent than those in Zone B. The is little variation both within single channels and between channels, except for along in channel 01 where there are a few narrow low-grade layers.

Nowhere has the zone been mapped from bottom to top, so the true width is quite uncertain. The minimum width as defined by channels 01, 02+03 and 20+21 is 129 m, 85 m and 100 m respectively. However, these profiles are open-ended.

Between Lake Teksevatnet and Lake Bilstadvatnet (Figure 6-3), a few individual NGU grab samples could indicate that Zone C continues here, parallel with the newly re-interpreted Zone B that occurs on Lauvneset peninsula (LAU in Figure 6-3). NGU grab samples and the drill hole at Ollestad (OL in Figure 6-3) have a Zone C chemical fingerprint (Figure 5-2) and indicate that Zone C exists besides Zone B in the east of the area.

At Hogstad, South of the Gyaåna River near Helleland (HO in Figure 6-1), the stratigraphic level MCU IV-e continues and several mineralised rocks with moderate grades were sampled here, both by NGU and SRK. These samples suggest that Zone C continues in this area (possibly at a lower grade), despite not having been delineated by the NGU. No continuous exposure has yet been observed to sample across the whole zone.

6.4 Other Targets

Several moderate- to high-grade mineralised occurrences exist in the high levels of the MCU IV-e unit, stratigraphically above Zone C. Some of these appear very local and discrete, whilst others like at Årrestad (Å2 in Figure 6-1), which is defined by spread of NGU grab samples, could have a larger extent. In the east of the area some large, strong, linear aeromagnetic anomalies could indicate further mineralisation at depth. The new aeromagnetic data which is currently being modelled will be of use in planning further investigations into these occurrences.

Another promising occurrence is at Grøning (GR in Figure 6-1) in the southern part of the intrusion where there are rocks with relatively high titanium grades in a small quarry. These have not been traced over large areas and may be very local, but work carried out on this occurrence is limited. No other obvious targets in the higher levels of stratigraphic units MCU IV-e and MCU IV-f are known, but the new aeromagnetic data may define new targets.

About 2 km southeast of Grøning (at MI1 in Figure 6-1) a small outcrop with high iron and titanium grades is associated with a strong magnetic anomaly of about 1 km length. An NGU grab sample from here contains 47.8% Fe_2O_3 and 24.8% TiO_2.

A further unit that has potential to extend over a larger area lies in the stratigraphic level above the Grøning quarry, in the Transition Zone above MCU-IVf. Relatively high vanadium grades (average 0.2% V, pXRF) but low P and Ti grades occur in homogeneous norites that could extend over a larger area which needs further investigation.

7 MINERALOGY

A mineralogical study was undertaken as part of an ongoing mineral processing testwork programme of three bulk samples, representing the three main mineralised zones of the Bjerkreim area. These samples have been formed by compositing the coarse reject material (+6 mm) of samples from individual channel profiles, one from each of Zones B, C and NEW. These samples were selected, based on their geology and geochemical assay results, to best represent the typical mineralisation styles and grades of their respective zones. Details of the composite samples are shown below in Table 7-1.

The mineralogical study was completed by Petrolab Ltd., subcontracted by Wardell Armstrong International Ltd. (WAI) in the UK who are undertaking the mineral processing testwork. A technical report from Petrolab (Zając & Brough, 2019) detailing the techniques and results is included in full in Appendix C and summarised below.

Table 7-1 Summary of composite samples submitted for mineral processing and mineralogy (from Zając & Brough, 2019)

Zone	Channel	No. Samples	P (%)*	TiO2 (%)*	V (%)*	Original Weight (kg)	Submitted Weight (kg)
B	10	29	1.72	6.46	0.065	170.3	112.3
C	20 & 21	44	1.43	4.90	0.046	255.7	167.7
NEW	17	33	0.03	6.62	0.050	210.8	144.8

**Results are weighted averages based on the submitted weight of the sample*

The scope of this study was to characterise the bulk mineral deportment and particle liberation in the samples at different size fractions. This work was carried out using ancillary scanning electron microscopy (SEM) and 'point-and-shoot' analysis was also undertaken to determine Ti and V values for magnetite, titanomagnetite and ilmenite. Results for the parent sample were back-calculated based on the proportional mass split between the fractions.

The samples were prepared and split by WAI into four size fractions (+1 mm, +500 µm, +250 µm and - 250 µm) and a sub-sample of each was sent to Petrolab.

7.1 Particle Maps

Particle maps were generated for each of each of the size fractions for each sample. The images created were Backscattered Electron ("BSE") and semi-quantifiable particle maps showing the mineral species identified. Both these images are created from the collection of multiple readings over the sample, giving a point reading that is then combined to create the image. The BSE images represent the compositional contrast and the particle maps use the energy-dispersive X-ray spectroscopy (EDX) analysis elemental results (at surface) to interpret the source mineral in relation for the BSE result, which are then mosaiced into the individual minerals.

In other words, the BSE images can be used to see the grains and texture within them, and the particle maps show the interpreted minerals within the grains. This in turn, has been used to calculate the bulk mineralogy, grain size and deportment.

An example of both these images can be seen below in Figure 7-1 and Figure 7-2.

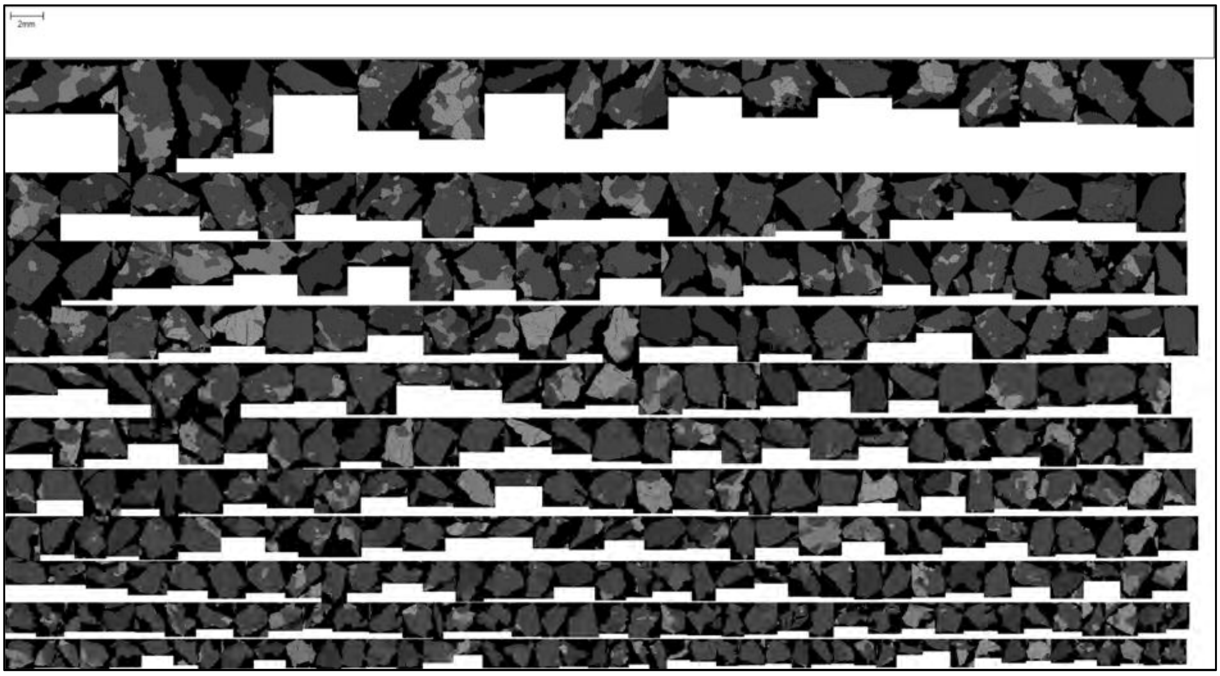


Figure 7-1 BSE image of the +500 µm size fraction from Zone B (from Zając & Brough, 2019)

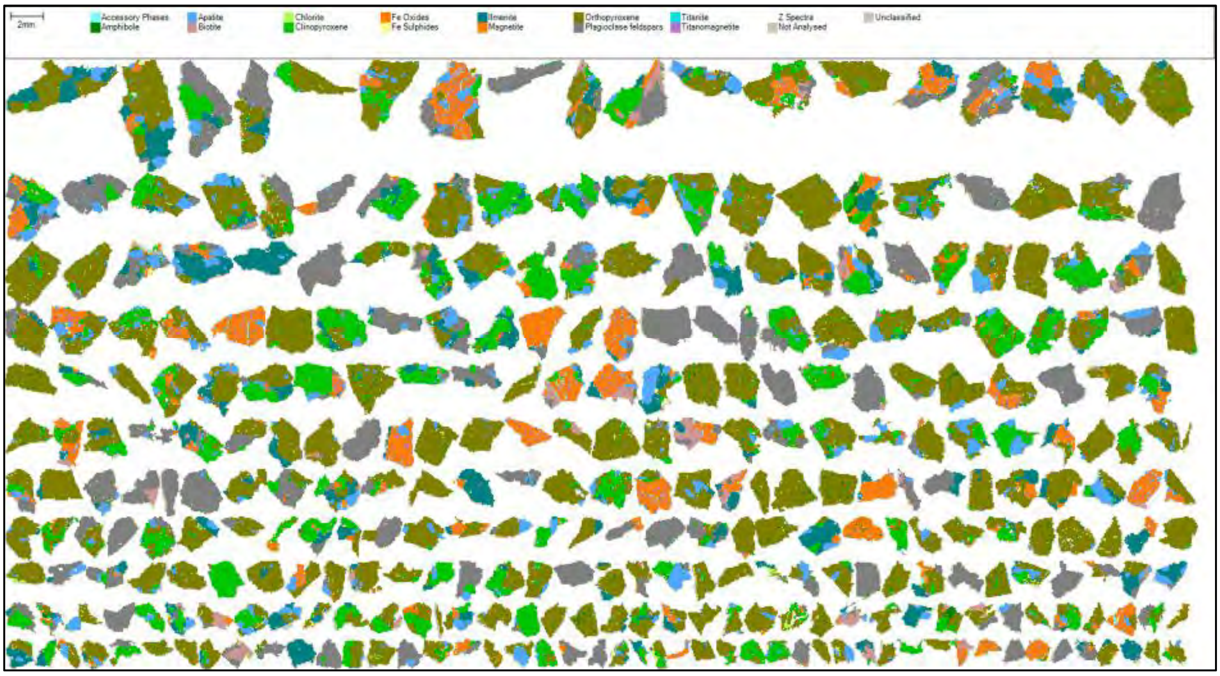


Figure 7-2 Particle map image of the +500 µm size fraction from Zone B (from Zając & Brough, 2019)

7.2 Bulk mineralogy

The mineralogical study classified four target minerals and associated gangue minerals, as summarised in Table 7-2.

Table 7-2 Mineralogical classification (from Zając & Brough, 2019)

Target mineral	SG*	Typical composition/Group minerals
Ilmenite	4.7	$FeTiO_3$
Magnetite	5.2	Fe_3O_4
Apatite	3.2	$Ca_5(PO_4)_3F$
Titanomagnetite	5.2	$Fe(Fe,Ti)_2O_4$
Gangue mineral	**SG**	**Typical composition/Group minerals**
Plagioclase feldspars	2.6-2.8	Predominantly anorthosite
Orthopyroxene	3.9	Ferrosilite $(Fe^{++},Mg)_2Si_2O_6$
Clinopyroxene	3.4-3.6	Predominantly diopside $CaMgSi_2O_6$, trace hedenbergite $CaFe^{++}Si_2O_6$
Chlorite	2.6	$(Mg,Fe)_5Al(AlSi_3O_{10})(OH)_8$
Fe Oxides	4.2-5.3	Hematite Fe_2O_3, goethite FeOOH
Biotite	3	$K(Mg,Fe)_3AlSi_3O_{10}(OH,F)_2$
Amphibole	3.0	Predominantly actinolite $Ca_2(Mg,Fe^{++})_5Si_8O_{22}(OH)_2$
Fe Sulphides	4.2-5.0	Predominantly pyrite FeS_2, trace pyrrhotite $Fe_{1-x}S$ | $x = 0 – 0.17$ and chalcopyrite $CuFeS_2$
Titanite	3.5	$CaTiSiO_5$
Accessory Phases	2.6-4.0	Include quartz, ilvaite, hercynite and gibbsite

**Typical mineral composition and s.g. data use for calculations of abundance by mass*

Magnetite and ilmenite were analysed using point-and-shoot scanning electron microscopy for vanadium and titanium content. Typical vanadium values in magnetite range between 0.55 % V in New Zone to 0.62 % V in Zone B. Exsolution textures were commonly observed during point-and-shoot analysis and these likely relate to variations in Fe and Ti content. Ilmenite doesn't contain any vanadium.

The target mineral phases include ilmenite, magnetite, apatite and titanomagnetite:

- The amount of ilmenite is similar in samples NEW Zone and Zone B and slightly lower in sample Zone C;
- Magnetite content is similar in all samples and varies from 4.7 wt% in NEW Zone to 6.6 wt% in Zone B;
- There is a distinct difference in apatite abundance across the samples. The sample from NEW Zone contains only trace apatite (0.2 wt%), while samples from Zone B and Zone C contain 8.4 wt% and 7.1 wt% apatite respectively;
- Titanomagnetite occurs in trace amounts in samples New Zone and Zone C with slightly higher abundance in sample Zone B (1.2 wt%).

The observations of mineral abundances are in agreement with grade variations seen in the channel sample assay data.

The main gangue mineral phases in all samples are plagioclase feldspars and orthopyroxene (mainly ferrosilite) with trace to major clinopyroxene. There are also minor amounts of chlorite, Fe oxides, biotite, amphiboles and trace Fe sulphides, titanite and accessory phases.

The total mineral compositions for the three parent samples can be seen in Figure 7-3.

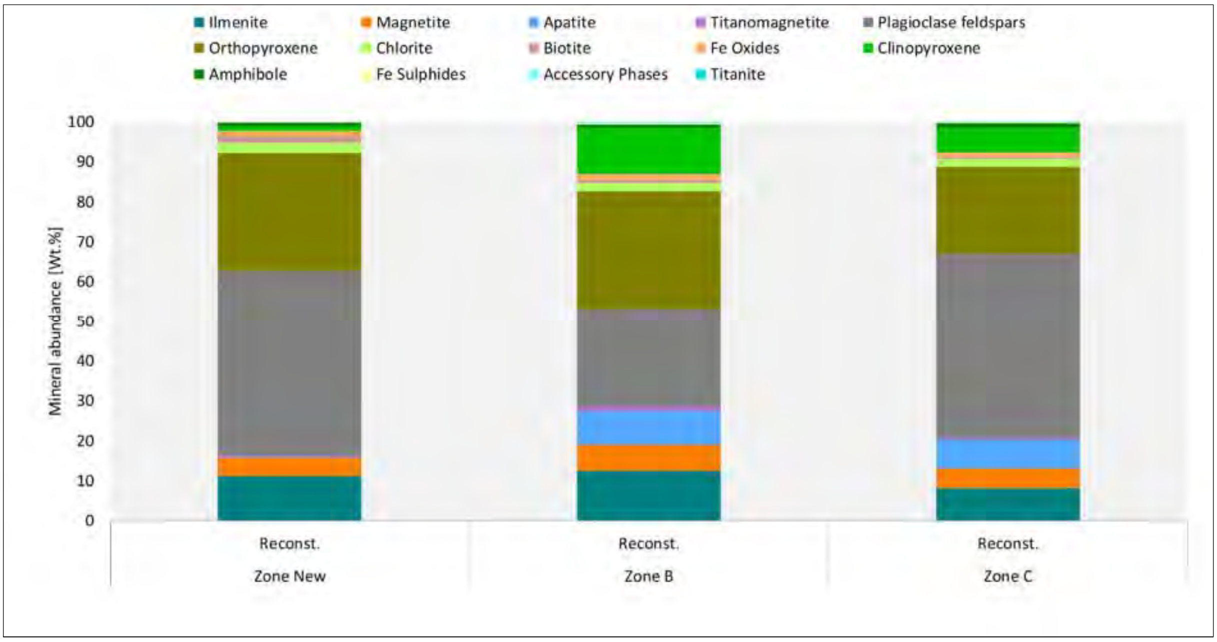


Figure 7-3 Mineral abundance for the reconstructed mineralogical samples (from Zając & Brough, 2019)

7.3 Deportment

A deportment study is the investigation of how element(s) are distributed between minerals in a sample. The four elements of interest (Ti, P, V and Fe) were all assessed for deportment and, based on the automated mineralogy results, reconstructed grades were calculated for the sample from each zone. This showed good agreement with the whole rock assay results from the corresponding channel samples (see Appendix C for more details).

The results from this work are shown below in Figure 7-4. These are encouraging in that they show Ti, P and V to be hosted in the expected mineral phases, ilmenite, apatite and magnetite respectively, and not contained in other minerals to any significant amount. Although titanomagnetite is present, it only accounts for very minor quantities of the Ti and V due to its low abundance within the samples. Fe is predominantly hosted in ilmenite and magnetite (>50% total Fe), with the rest contained in other rock forming minerals that are not of economic interest.

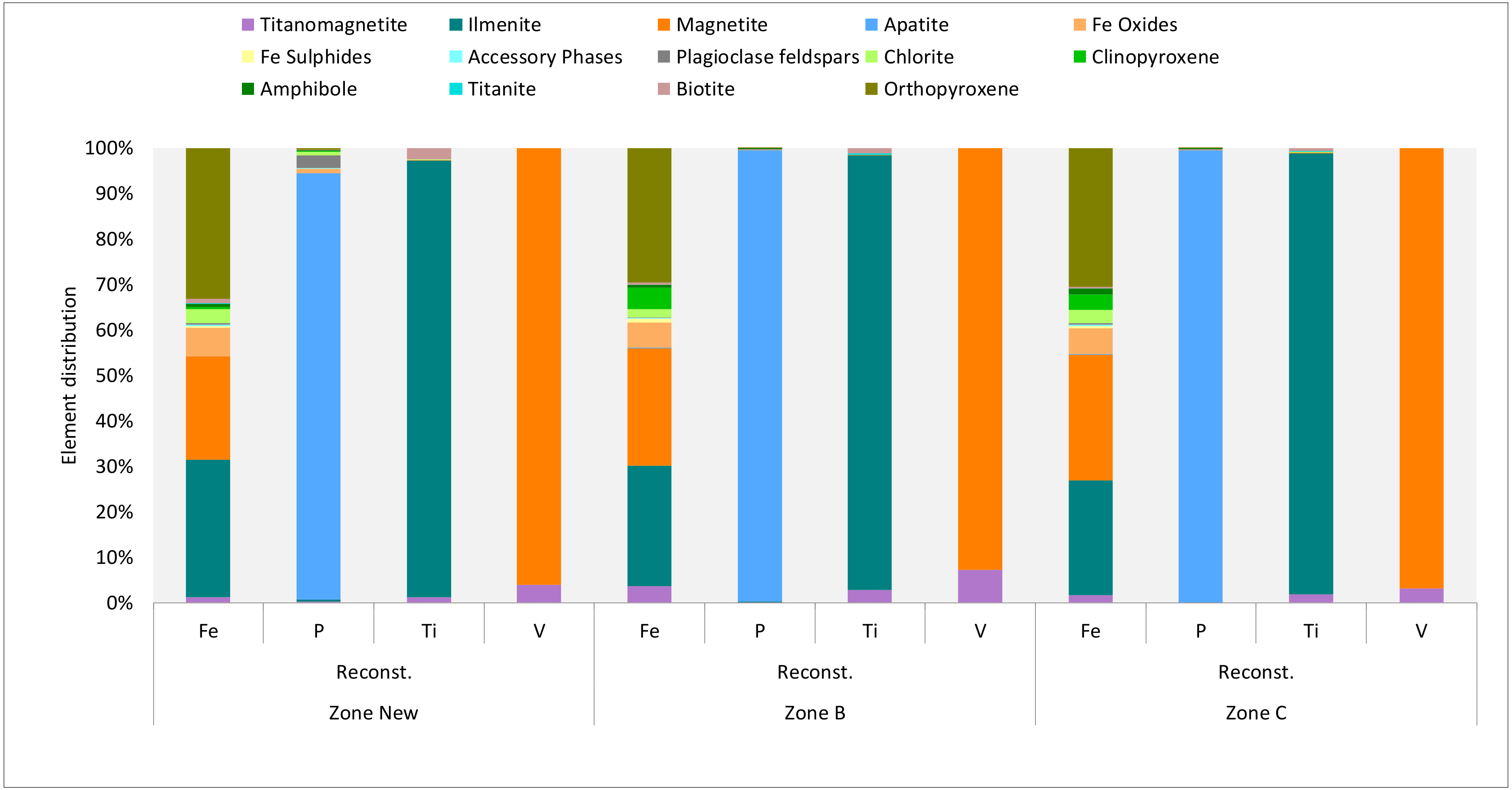


Figure 7-4 Department of elements of interest within the mineralogical samples (from Zając & Brough, 2019)

7.4 Grain Size

The grain size occurrence and distribution statistics for ilmenite, magnetite, apatite, titanomagnetite and overall mineral particles is shown in Table 7-3. This information is used for guidance in mineral processing testwork.

The grain-size statistics for ilmenite and magnetite are similar in all samples except in Zone C where the magnetite is coarser. Apatite is finer-grained than ilmenite and magnetite. Titanomagnetite is much finer grained than remaining target minerals. The overall grain size distribution of target minerals is similar in each sample.

Table 7-3 Grain size of target minerals (from Zając & Brough, 2019)

Sample[1]	Occurrence[2]	Grain size (µm)			
		D20[3]	D50	D80	D95
Mineral Particle					
Bjerkreim New Zone	1,935	469	1,000	1,555	2,022
Bjerkreim Zone B	2,029	257	832	1,504	1,992
Bjerkreim Zone C	1,952	288	930	1,549	2,142
Ilmenite					
Bjerkreim New Zone	1,180	206	413	679	890
Bjerkreim Zone B	1,500	146	301	564	1,010
Bjerkreim Zone C	844	196	403	741	1,143
Magnetite					
Bjerkreim New Zone	776	172	405	769	892
Bjerkreim Zone B	1,318	128	302	586	876
Bjerkreim Zone C	724	157	541	932	1,283
Apatite					
Bjerkreim New Zone	72	99	222	292	388
Bjerkreim Zone B	2,224	113	197	351	627
Bjerkreim Zone C	1,334	110	192	345	609
Titanomagnetite					
Bjerkreim New Zone	1,464	19	23	39	77
Bjerkreim Zone B	4,227	15	24	55	92
Bjerkreim Zone C	1,447	19	23	52	142

[1]*reconstructed sample*

[2]*number of individual particles scanned as part of this process including particles with multiple minerals*

[3]*Dx is the grain size at that percentage point within the grain size distribution of that mineral by cumulative mineral mass, i.e. D80 is the grain size at the 80% point, with 80% by mass finer and 20% coarser than the given diameter value in µm.*

7.5 Scanning Electron Microscopy

Magnetite, titanomagnetite and ilmenite grains from all three samples were located and analysed by EDX with a total of 60 points in order to determine the content of the targeted elements in these grains. This can give some initial indications on the quality of the minerals as economic commodities.

- The V values show consistency across individual magnetite grains with average content of 0.59%V and a range of 0.0-0.68 %V;
- The average content of Ti in magnetite was 0.64 %Ti, with a range of 0.01-2.43%Ti;
- The average content of Ti in ilmenite was 29.25% Ti, with a range of 28.21-30.47% Ti.

8 DISCUSSION AND RECOMMENDATIONS

The aim of this first phase of exploration in the Bjerkreim project area was to test the results of the historical NGU work and to better define and extend the zones of known mineralisation. This included testing both the potential grade of different zones of mineralisation as a whole and the continuity of mineralisation across strike. The exploration conducted in 2019 has succeeded in both these two aspects.

This work has concentrated on the central part of the project area, mainly due to amount of historical data and the opportunity this gave to validate historical data. As a result, the mineralised Zone A has not been investigated and should be included in any subsequent exploration work.

Almost all interpretations of the mineral potential of the Bjerkreim area by NGU was based on field observations supported by grab samples collected within the mineralised zones. Based on the results from these samples, NGU proposed average grades for the target elements in the area in the three mineralised zones A, B and C. The continuous channel sampling performed by SRK across the central part of the known mineralised zones has established a more robust and representative framework for the potential grades of economic minerals. This data also provides a better basis to evaluate along-strike consistency because it has allowed chemical characteristics of each zone to be established and compared between channel samples separated by several kilometres along the zones.

8.1 Conclusions

The variations in channel sample grades for the three target elements are shown in Figure 4-1. The data indicates that Zone B has the highest-grade potential when incorporating all the elements of interest. Grades are slightly higher east of Lake Teksevatnet. P and V grades are the highest in Zone B while NEW Zone has the highest Ti grades with V grades approximately the same as Zone B, but apatite (P) is absent. Zone C has all three elements of interest, at slightly lower grade than Zone B.

The channel sample assay data to a large extent agree with the NGU grab sampling results as shown in Table 5-2. Only the grades reported by NGU for Zone C west of Teksevatnet are significantly higher, ranging from 0.3-1.0% for both TiO_2 and P_2O_5 above that reported by SRK's channel sampling.

With respect to the across-strike continuity of the mineralised zones (i.e. going up/down through stratigraphy), the channel sample results and field observations, show that grades in both Zone B and NEW Zone can vary considerably. The highest grades are found in rock sequences within the wider parts Zones (between 5 and 100 m wide), leaving considerable gaps locally within the mineralised zones.

Regarding along-strike grade continuity, the reconnaissance work and a new evaluation of the NGU grab sample data has shown that variations exist in the mineralisation. This is especially true within Zone B between Lusiknuten (channel 14) and Terland Farm, with the latter being of lower grade and lacking the typical banding/layering exhibited by Zone B rocks elsewhere. This forms an approximately 1 km long lower-grade section in the Zone B mineralisation. The new aeromagnetic data also indicates that although the zones appear continuous as magnetic anomalies, the strength of the magnetic signal is variable along strike, which could indicate that grade is variable along strike.

The width of the zones is also variable along strike, as also suggested by NGU. Zone B is approximately 90 m wide immediately west of Lake Teksevatnet, non-existent or very narrow at Gyaåna and then again at least 150 m wide at Terland Farm. New Zone shows a similar variation, locally consisting of isolated sequences of mineralised rocks of less than 10-40 m wide, but then in Tekse East forming a zone of continuously mineralised rocks that is slightly more than 100 m wide.

Chemical characterisation of the three mineralised zones shows that a certain chemical ‘fingerprint’ can be used to discriminate between them. This characterisation also shows that some variation occurs along strike within a mineralised zone, especially between the eastern and western sides of Lake Teksevatnet.

At the location now occupied by Lake Teksevatnet, an elevated area seems to have existed in the floor of the magma chamber during the intrusion’s emplacement. Onlap of the layers onto this high has caused the stratigraphic sequence to thin and be closer spatially in this area. For example, the distance between Zone B and NEW Zone on the western shore of Lake Teksevatnet is in the order of 20 m, while 1.5 km to the northeast that distance is around 200 m. This has important consequences for future economics (pending a mining study and economic analysis), as it may be possible to use a single open pit to mine two zones that are so closely spaced, if it is shown that this is the optimal mining technique.

Reconnaissance work and a re-interpretation of the historical data has resulted in extension of the mineralised zones, as compared to NGU’s mapping. The current interpretation is shown in Figure 8-1, which also shows the degree of confidence in the interpretation; some potential areas of interest (red in Figure 8-1) are either poorly exposed or not yet ground-checked and largely based on aeromagnetic data. The variation of the grades in the zones is shown in Figure 8-2.

The principal change from NGU’s interpretation is that instead of only Zone C being present east of Lake Teksevatnet in NGU’s interpretation, all three mineralised zones have now been recognised. This means that, potentially, the combined extent of the mineralisation has substantially increased in this area, and the recognition that Zone B persists to the east of Teksevatnet may be particularly important. Preliminary interpretations of the newly-acquired aeromagnetic data suggest that some adjustments need to be made to SRK’s model in the area between Lakes Teksevatnet and Bilstadvatnet, but the general conclusion that all three mineralised zones continue here is still valid.

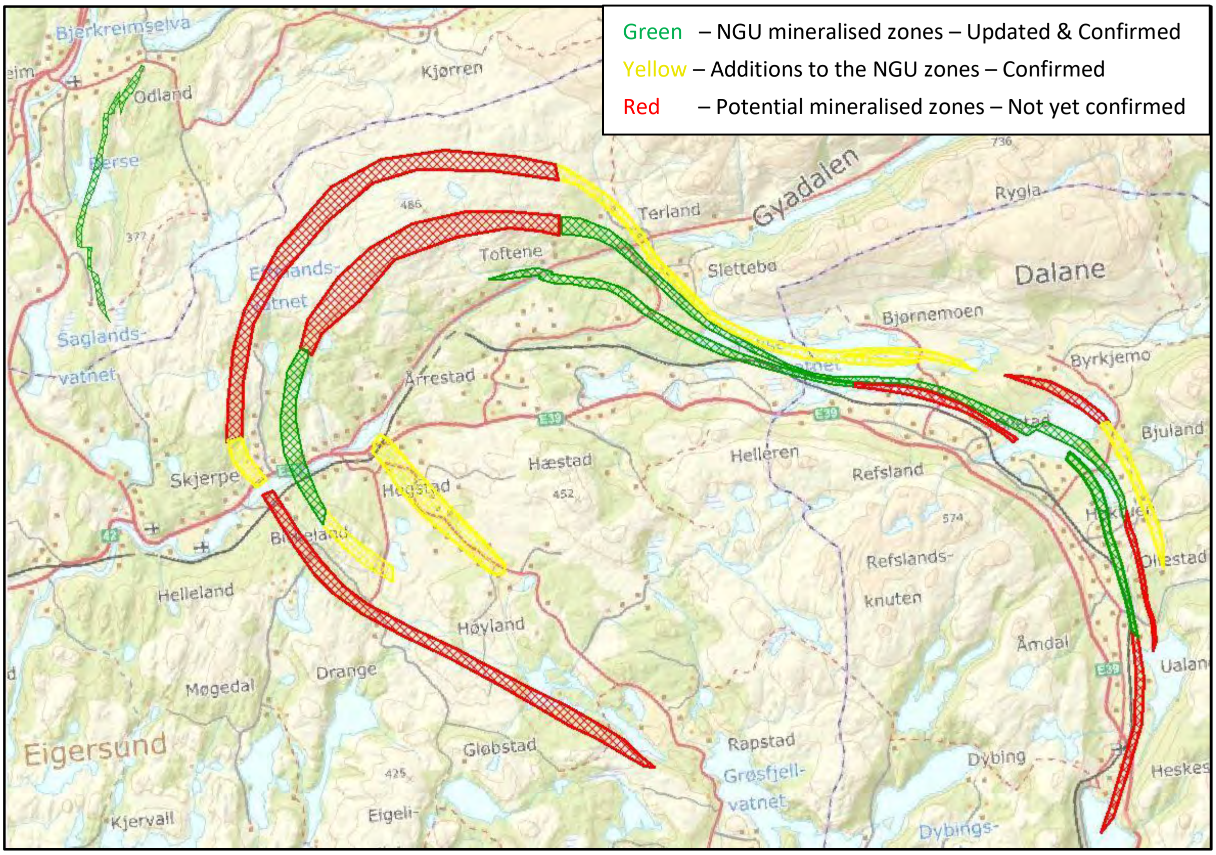


Figure 8-1 A new model for the extent of the mineralised zones and the degree of confidence in them

Additional mineralised zones, or extensions of known ones in yellow are based on reconnaissance fieldwork and re-interpretation of NGU sample analyses. Potential areas of interest (red) are either poorly exposed, locally do not reach surface or not yet ground-checked. They are largely based on aeromagnetic data.

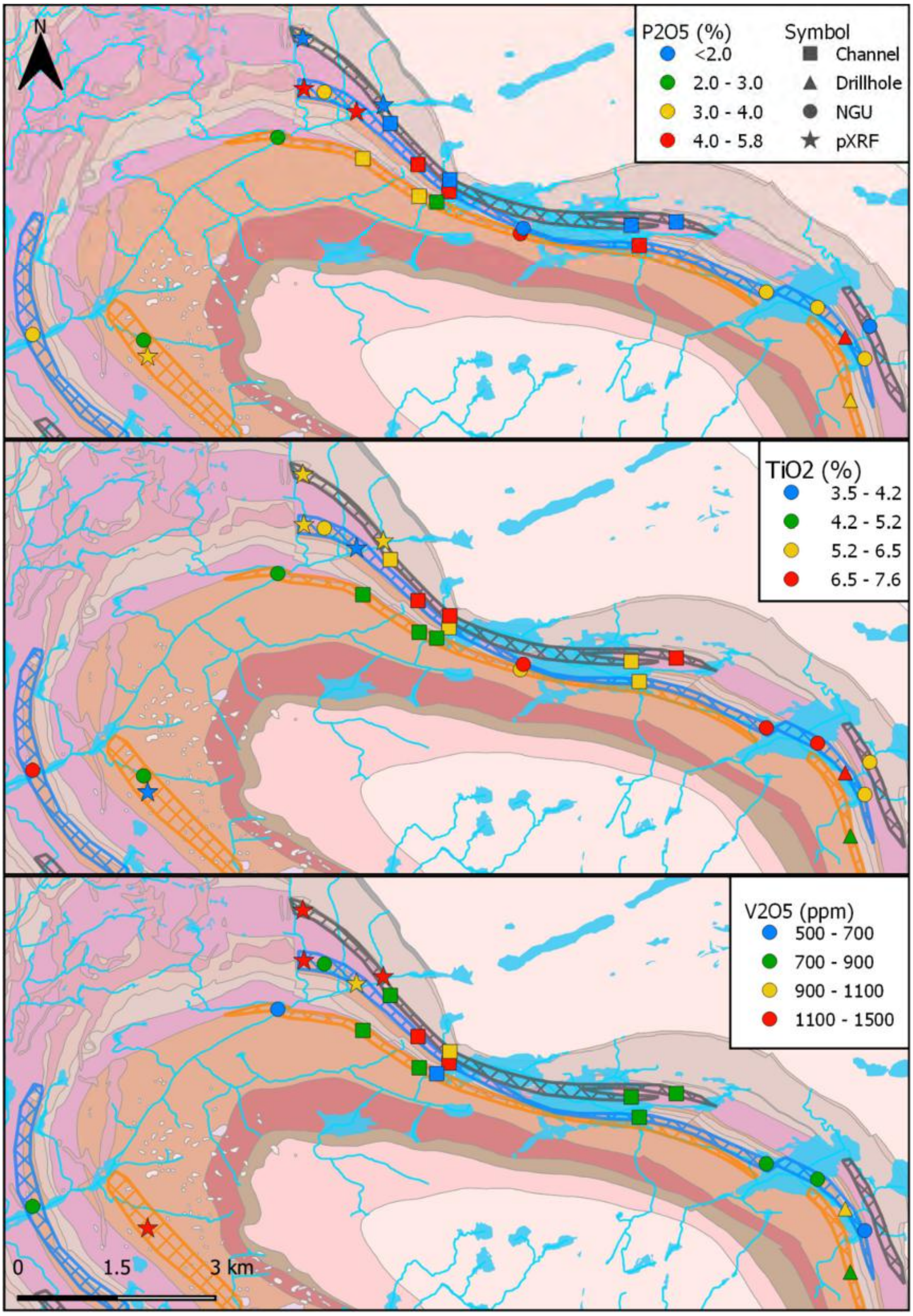


Figure 8-2 Geological map with grades of economic elements in the three mineralised zones

The grades of the three economic elements (oxides) are taken from 1) SRK channel samples, 2) NGU drill holes, 3) NGU grab samples and 4) SRK pXRF analyses. The data are averages of 1) whole sampled sections through a mineralised zone, 2) average over a whole drill hole, 3) and 4) a group of grab samples or pXRF analyses from one location, representing a single mineralised zone. In locations where both channel samples and NGU grab samples exist, only the channel sample grades are shown. Colours of the three mineralised zones as in previous figures. Plotted on the geological map, legend as in Figure 2-1.

SRK's work has also shown that the mineralised zones can be extended into the southern part of the area, albeit apparently at slightly lower grades (based on a very limited amount of sampling). This means that all three mineralised zones consist of an eastern section and a western section, separated by a hinge zone in the core of the trough structure, where Zones B and C are not exposed. It is possible that NEW Zone does continue through the hinge zone, and magnetic signals suggest that Zone B possibly continues here at depth. The new extensions of the mineralised zones need to be investigated further.

Outside the levels of the stratigraphy that host the known mineralisation, there are several other areas that could potentially host mineralisation of interest, mainly located in the southern part of the Bjerkreim lobe at stratigraphically higher levels, closer to the core of the intrusion. In addition, the potential for an equivalent of NEW Zone in a higher Magmatic Cycle Unit (MCU IV-d) needs to be investigated. No significant mineralisation was observed within this level during fieldwork in the northern area. In the southern area however, one NGU grab sample reported 5.1% TiO_2 and is related to a magnetic anomaly at this level that may indicate an extension of this mineral occurrence. The final aeromagnetic anomaly maps will likely show other locations of interest that require ground proofing.

The mineralogical study undertaken as part of the wider metallurgical study shows that the predominant ore minerals are ilmenite and magnetite. Ilmenite and apatite are the main source of Ti and P respectively, with magnetite hosting >95% of the V with an average grade of ~0.59% (within magnetite). The grain size distribution of the target minerals are similar to each other except within Zone C, where the magnetite is coarser. These results are positive and agree with the historical mineralogical work undertaken by the NGU. At the time of writing this report the metallurgical study is ongoing and SRK cannot comment further on the beneficiation potential of this material, however there appear to be no fatal flaws identified so far with respect to the mineralogy of the target mineralisation.

8.2 Recommendations

This initial phase of work has concluded that Zone B hosts the highest proportion of target minerals, making it the priority for further exploration. This work has also identified and interpreted potential extensions to the known mineralised within the BSL. With this in mind, SRK recommends the that further exploration focuses on the following activities to advance the project.

8.2.1 Geophysical modelling/interpretation

The airborne electromagnetic and magnetic survey undertaken over all of Norge Mining's exploration licences in 2019 will produce important data for refining geological interpretations and targeting further exploration. Modelling of the final data will need to account for lateral extensions of mineralised zones at surface and their extension to depth; it is likely that it will again result in a new interpretation compared to that shown in Figure 8-1, and may identify new exploration targets at depth. Further geological fieldwork will be directed by these data and can commence soon after interpretations are completed/

8.2.2 Mapping/Reconnaissance

SRK recommends that mapping and reconnaissance work is undertaken outside the focus area of this recent phase of work. The objective will be to confirm mineralisation in areas identified in SRK's interpretation model as having potential to be new occurrences or extensions of known occurrences (Figure 8-1. The mapping should include the use of a magnetic susceptibility meter and a pXRF analyser which will allow for rapid determination of whether mineralisation is present and, if so, some indication of which zone it may represent. Channel sampling is also recommended where appropriate in order to obtain representative grade data prior to further work.

SRK is involved with ongoing tests to determine whether hyperspectral imaging of outcrops would be a useful tool to aid mapping and identification of mineralisation. This is a photographic method that analyses absorption and reflectance of infrared light and can identify the targeted minerals based on the recorded spectra and provide an indication of their relative abundance within and between mineralised zones. It could aid in the prioritisation and characterisation of targets that can then be investigated further with detailed mapping and sampling. The method would be most effective in relatively dry, warm and bright conditions and therefore is best deployed in spring or summer.

Based on the mineralisation model and observations seen in the field, SRK interprets that there may be pockets of elevated grade within the mineralised zones and these require further delineation. A known example of this elevated grade model is east and west of lake Teksevatnet where Zone B is seen to be more endowed with elements of interest. This also seems to be shown by the aeromagnetic data. Detailed mapping and sampling should also be undertaken on anomalously magnetic areas within the mineralised zones. This should include channel sampling and pXRF analysis in areas that are spatially separate from the sampling undertaken in 2019 in order to increase sample coverage along strike.

8.2.3 Scout Drilling

SRK recommends undertaking a 'scout' diamond drilling programme of 2,000-4,000 m in total (for example, 10-20 holes of 200 m length each) targeting two or more zones of elevated grades within the defined zones, Zone B being a priority. Drill planning will be undertaken once all outstanding information has been reviewed and interpreted, particularly the metallurgical and geophysical data. It is also recommended that the above mapping field programmes are undertaken before any drilling is carried out to minimise the risk and ensure the most prospective areas are targeted. That said, it is possible that the 2019 sampling data and geophysical data could provide sufficiently robust targets to consider drilling at an early stage.

Multiple inclined drill holes on parallel 'fences' would be used to drill and sample the mineralised zones along strike and at least two points at depth. This will give the most geological and structural information required to understand the mineralised bodies. Having multiple pierce points through both the hanging and footwall contacts will allow for more accurate modelling of the geology and geometry of the mineralised layers.

In areas where the zones are close and parallel to one another, it may be possible to intersect more than one zone of mineralisation within single holes, although these may need to be several hundred metres long. This will provide information about the degree of dilution between the zones, should such areas be mined in a single pit.

SRK does not consider the depth extent of the mineralisation to be a limiting factor as there is good geological reason to assume that they extend to hundreds of metres depth. More information may become available on this following modelling of the new geological data. The grade and width variation with depth, however, is unknown and only drilling can answer this.

8.2.4 Conceptual economic analysis

SRK undertook a conceptual economic model for the project in March 2019. This was to provide a conceptual view of which of commodities, or what combination of commodities, is likely to be the principal economic driver to a future mine. This work should now be updated with the new grade information from the channel samples, better understanding of the extents of mineralisation, the metallurgical test work results and incorporation of the mineralisation type at New Zone. This work will also use an updated commodities price forecast. This work must also include a trade-off study to assess the viability of underground mining compared to open pit mining. This information will be useful for designing future exploration as well as in ongoing stakeholder engagement and assessment of the impact of the proposed new road in the area.

8.2.5 Continued Stakeholder Engagement

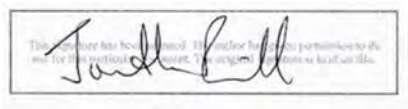
It is critical that Norge Mining continues and expands their stakeholder engagement activities, particularly as exploration may move towards a more intensive and invasive approach and in light of developments surrounding the E39 road. Monitoring community sentiment towards the project is also important as it develops. Increased dissemination of information should be considered in the form of public displays and public meetings so that local stakeholders are aware of project and how it is developing. The next phase of exploration would also benefit greatly from the involvement of a dedicated community relations person who can coordinate and record engagement activities, obtain consent to access exploration areas and be a first point of contact for the community. Overall, operating in a way that is as open, accessible and transparent as possible will help greatly in maintaining trust, tolerance and acceptance of Norge Mining within the community.

Finally, it must be remembered that exploration activities should always be planned and implemented in such ways that minimise the impact on the community and the environment, whilst also obtaining quality data. This requires very robust exploration targeting and logistical management, collaboration with local landowners and authorities, and operating to the highest standards in the field. This is critical to maintaining good relations and avoiding opposition to the project.

For and on behalf of SRK Exploration Services Ltd

Authored by:

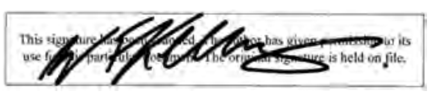
Jeroen van Gool,
Senior Exploration Geologist
SRK Exploration Services Ltd
Date: 09/12/2019



Jon Russill
Principal Exploration Geologist
SRK Exploration Services Ltd
Date: 09/12/2019

Patrick Johnson
Exploration Geologist
SRK Exploration Services Ltd
Date: 09/12/2019

Peer reviewed by:



Bill Kellaway
Principal Exploration Geologist, Chairman,
SRK Exploration Services Ltd
Date: 09/12/2019

SRK EXPLORATION SERVICES LTD

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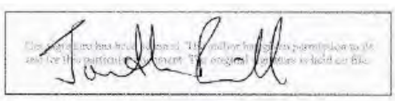


9 APPENDIX A: DESCRIPTIONS AND PLOTS OF THE SAMPLING CHANNELS

9.1 Introduction

Each of the channels is briefly described based on the plotted values of P, Ti and V and on field observations. The chemical data are plotted as horizontal distance from the collar, but small gaps in the channels are ignored in the plots, therefore the plotted channel lengths can be shorter than the actual length from Collar to End-Of-Channel (EOC). Because the geological layering is rather steep in the majority of the sampled sites, the horizontal lengths are close to true thickness. The dip angles are between 70° and 90° for most of the channels, with the exception of channel 16 where dip angles are 30° to 45°. Where several channels are sampled more or less in extension of each other, sampling one mineralised zone, they are plotted together, with the data projected on a common line. Where historical NGU grab sample locations are at or near the channel, the data for these were also projected on figure in the correct location. At Øygrei N (Figure 3-7) the channels from two islands (channels 12 and 13, about 100 m off the shore) were projected onto the line of channels 07 to 09 in order to constitute a more complete section.

Most of the channels are sampled (and plotted) from stratigraphic bottom to top and are thus “right way up”. Stratigraphic way up could in most areas be determined from compositional grading of some of the layers. In very few locations inverse grading was observed.

The projections have a certain inaccuracy, increasing with the distance to the line of section. It was also found that NGU sample locations are not always totally accurate, sometimes with an error between 5 and 10 m. It should be noted that errors of the same magnitude were detected in the locations of some of the channels, most likely due to cumulative errors in handheld GPS data (which has ± 5 m accuracy) as well as in the tape and compass method of surveying. It is suspected that local magnetic variations due to high magnetite contents in the rock caused errors in compass readings. Where possible, these errors were corrected during fieldwork in September 2019, but locations on the shores of Teksevatnet could not be checked due to high water levels. The locations of the channels are shown in Figure 3-5 to Figure 3-7.

SRK believes that the NGU’s grab samples were collected with a bias, often towards the more mineralised dark bands in the rocks and thus favouring higher grades. When comparing NGU grab sample results with channel sample results, the types of the samples (leucocratic versus melanocratic) in the NGU dataset is taken in consideration. Sample descriptions for many of the NGU the grab samples are given by Schiellerup et al. (2001).

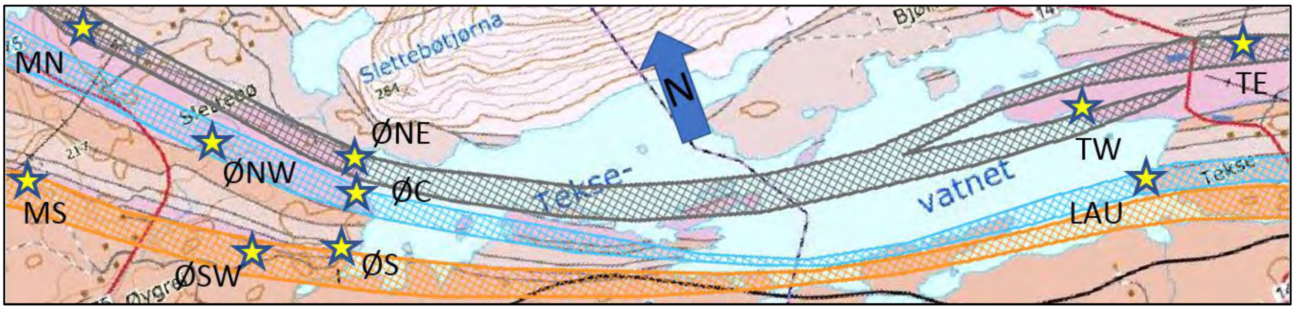


Figure 9-1 Locations of the channel samples

Acronyms are explained in the text.

9.2 Channel 1 – Øygrei S (ØS) – Zone C

The collar and first three samples are in a small stream about 10 m from the shoreline of Teksevatnet, and the remainder was collected along the waterline at low water level (submerged during normal water levels). There are several small offsets.

The channel is about 63 m long and starts and ends in banded rocks. The collar is within 10 m of the base of the mineralised zone in the NNE. To the SSW, banded rocks were observed as far as 66 m from the end of the channel. That gives a minimum width of Zone C at this location of 129 meters. Grab samples with similar grades (plotted in the top of the diagram, Figure 9-2) occur as far as 47 m from the SSW end of the channel, projected onto the same line.

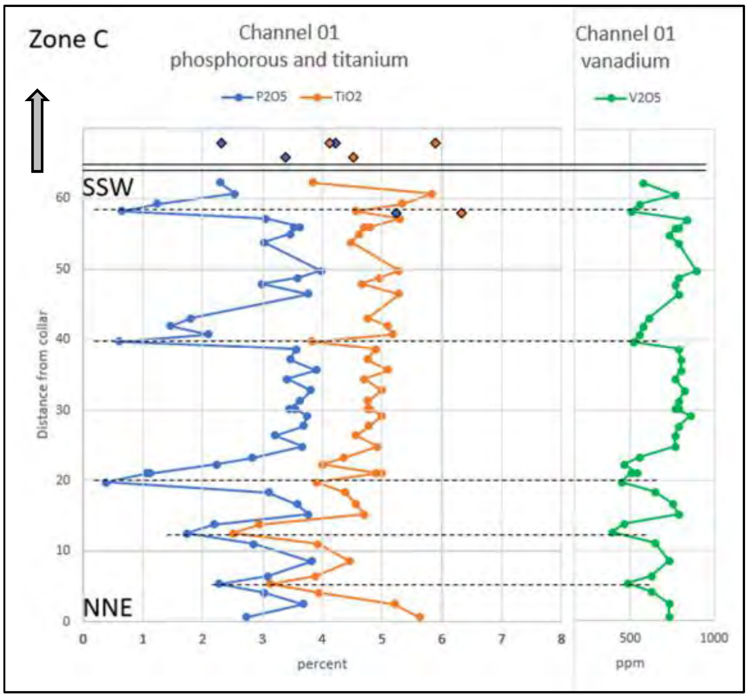


Figure 9-2 Ti and V grades in channel 01 in Zone C at Øygrei S

Stratigraphic top is indicated by the grey arrow. Dashed lines highlight correlation of peaks. Full lines are breaks. Diamonds are NGU grab sample compositions, using the same colour coding as the channel samples. Only one grab sample was collected at the location of the channel, and the positions of the three samples beyond 65 m are not accurate. They were collected at about 40 m and 150 m distance from the channel.

There is a lot of variation in the concentrations of the three elements, up to three percent between lowest and highest P and Ti grades. There is a variation of around 300 ppm in V. Overall the grades are low to moderate. The spacing between dark bands (iron- and ilmenite-rich) is generally larger than in Zone B and quite irregular. There is no very obvious visible reason for the three large dips in concentration of P and Ti. Peaks (positive and negative) in the concentrations of the three elements correlated well.

NGU grab samples from near the channel plot on average at slightly higher P and Ti grades (Figure 9-2). This is possibly due to the grab samples preferentially being collected from the darker layers, rich in ilmenite and apatite. No V data are available from the grab samples.

Figure 9-3 Typical banded rocks in channel 01 in Zone C at Øygrei S

Photo location is at samples ES3575 and 3576 and is looking WNW. Banding is more obvious in the rocks in the background.

On the south shore of the lake, where the shoreline (and thus exposure) is parallel with the banding, it is obvious that the sequence of bands is very consistent over long distances along strike (Figure 9-4).

Figure 9-4 Banding in Zone C on the southern shore of Lake Teksevatnet, looking ESE

In much of the area the bands are straight and parallel, being consistent over long distances along strike.

9.3 Channels 02 and 03 – Øygrei SW (ØSW) – Zone C

These two channels, with 29 m offset, cover the SW part of mineralised zone C 280 m to the WNW of channel 01. There is a 5 m gap where the channel crosses the gravel road. There is a few meters overlap of the two channels.

The overall features are very similar to those of channel 01, but the grades are more consistent and average grades are slightly higher, lacking the high number of low-grade dips seen in channel 01. Variation lies largely within 1 % for P and Ti, with one dip at 46 meters. The sample from here is highly weathered. V grades in these channels are also more consistent than in channel 01. Peaks correlate between the three elements.

The plotted length of the combined channels is 72 meters, but the actual width of the mineralised zone covered, from collar ch02 to EOC ch03 is only 66 m, due to the overlap. The upper, SW boundary of Zone C is assumed to lie close to the SW end of channel 03. The distance to the lower – NE boundary is unknown, but assuming that the northeastern boundary of the zone strikes consistently from the lake shore, the width of the mineralised Zone C is here also well above 100 m.

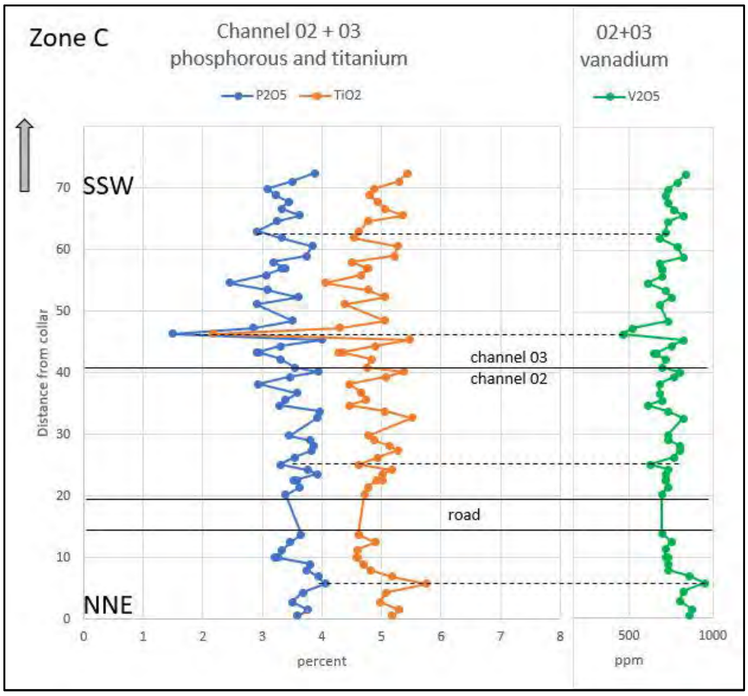


Figure 9-5 Ti and V grades in channels 02 and 03 at Øygrei SW

Stratigraphic top is indicated by the grey arrow. Dashed lines highlight correlating peaks. Full lines are breaks.

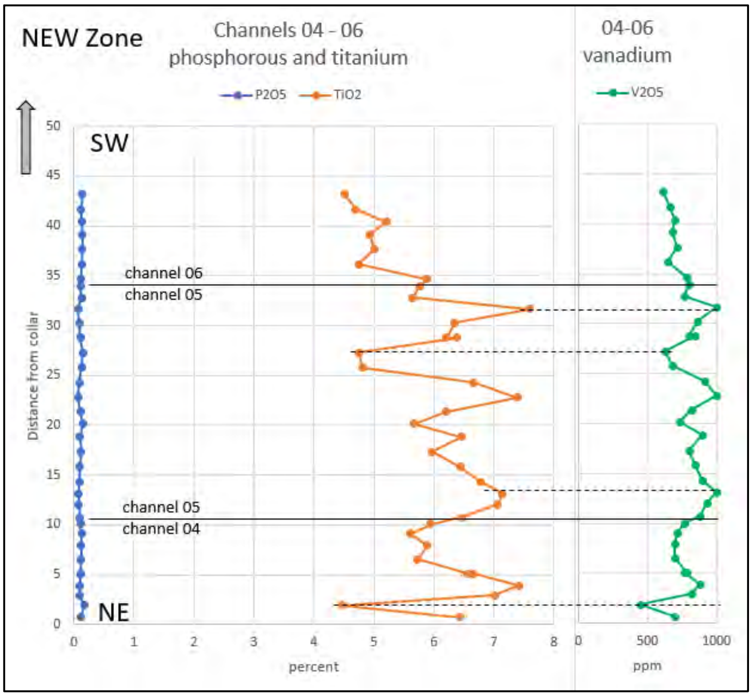


Figure 9-6 Ti and V grades in channels 04 to 06 at Melhus N

Stratigraphic top is indicated by the grey arrow. Dashed lines highlight correlating peaks. Full lines are breaks.

9.4 Channels 04 to 06 – Melhus N (MN) – NEW Zone

This is the location at Melhus farm where NEW Zone was discovered in the beginning of the fieldwork. The banded rocks are very well exposed over many tens of meters on the top of this small hill. A certain consistency along strike exists here too, but several troughs and truncations are exposed here. One large (3 m long) and one small (sub-meter size) anorthosite inclusion occur in the sequence here. The three channels constitute an almost complete section through the mineralised zone. The collar of channel 04 lies few meters above (stratigraphically) the lower boundary (to the northeast). The last 4 samples lack the tight banding and are relatively homogeneous. The upper (SW) boundary of the mineralised zone is assumed to lie within channel 06, but there is no sharp boundary. The grades are slowly decreasing to the SW. The total width of NEW zone here is about 40 m.

New Zone lacks apatite, and the phosphorous grades are close to zero. The TiO_2 grades show about 2% variation. On average the TiO_2 concentration is around 6% but with many peaks above 7%. Vanadium varies in the same way and peaks correlate well with TiO_2. Titanium grades are about 1% higher than in the previously discussed channels in zone C. Vanadium is comparable.

9.5 Channels 07 to 09 + 12 and 13 – Øygrei NE (ØNE) – NEW Zone

These channels are in the NW corner of Lake Teksevatnet, on the shore of the lake at a location also referred to as “Steinar’s cabin”. The channels are mainly cut at a level that is below normal water level. Exposure here is not continuous, and the landowner requested not to cut in a certain part of the beach. Therefore, there are many gaps in the section. Two of the gaps could be filled with channels sampled on two small islands 100 m off the shore (channels 12 and 13). The location of channel 09 is about 5 m too far to the ESE.

In the stratigraphically lowest part of the sequence, channels 7 and 8, banding is not very pronounced and rocks are relatively homogeneous. The rocks on the islands, on the other hand, show a much more intense banding and overall higher percentage of dark bands. This is clearly reflected in the lower grades of channels 07 and 08, compared to channels 12 and 13. Channel 09 starts in the stratigraphically lowest part at a very high grade that then gradually decreases.

Some of the gaps in between the channels are occupied (in part) by homogeneous, felsic, lower grade rocks. Although lack of continuous exposure hampers the exact evaluation, the overall impression of NEW Zone here is that it consists of several narrow mineralised zones, 10 to 15 meters wide, separated by low grade intervals, of which some are less than 10 m wide, but between channels 7 and 9 could be over 30 m wide.

To the NE the outcrop is limited by the lake, to the SW soil cover ends the section. Although the section is open-ended to both sides, there is not a lot of space for unexposed extensions to either side, and the opinion is that these channels virtually cover the whole width of NEW Zone in this location. That gives a width from the lowest to the highest (stratigraphically) mineralised rocks of about 115 meters. But not with 100% mineralisation over the whole width. Mineralised, banded mafic-felsic zones of tens of meters are interlayered with zones of similar size dominated by homogeneous, felsic, low-grade rocks.

There is no apatite in these rocks. Ti and V grades are highly variable, both slightly higher than at Melhus farm, especially in the upper (SW) part of the section (channels 13 and 9). There is good correlation of peaks between Ti and V.

Five NGU samples were collected in the same section (Schiellerup et al. 2001) which at that time were marked as zone B samples. All five samples were collected on the beach very close to the main line of the channels. All NGU V grades are lower than in the channel samples. The two samples in the stratigraphically lower part of the section give approximately 4% higher Ti grades than the channels (7, 8 and 12), while two of the samples from the stratigraphically upper part give Ti grades that are 3-4% lower than the channels. The fifth NGU sample has a Ti grade that is similar to the grade in the channel. It is assumed that the differences are a result of selective sampling by NGU.

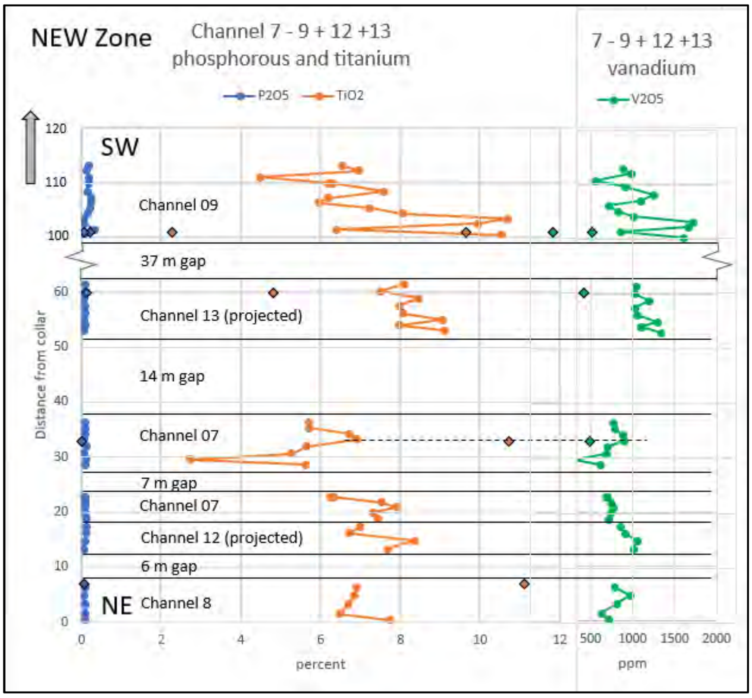


Figure 9-7 Ti and V grades in channels 07 to 09 plus 12 and 13 at Øygrei NE

Stratigraphic top is indicated by the grey arrow. Diamonds are NGU grab samples and have the same colour coding as the channel samples. Dashed lines highlight correlating peaks. Full lines are breaks.

9.6 Channel 10 and 11 – Øygrei C (ØC) – Zone B

These channels are also cut on the beach of Lake Teksevatnet, in the northwest corner, south of channels 07 to 09. The two channels are not collected along the same line, but they are laterally offset approximately 34 m from each other. Most of these samples are collected below normal water level. There is a c. 36 m gap between the two channels (measured along the common line of section) which consists of unexposed parts and lower-grade parts. Note that the two channels are collected in reverse order. Channel 10 is higher in stratigraphy than channel 11.

The rocks are layered, with layering on average 10-20 cm wide. Rather than a strong separation between very dark and very felsic layers, the rocks are overall of intermediate composition.

The lower part of the section (channel 11) shows slightly higher grades of P and Ti than the upper part but is more varied. V grades are similar in both sections. Grades in all three elements fall off towards the central gap.

Eighteen NGU grab samples from the same section show more extreme higher and lower values. They represent pure melanocratic (dark) or leucocratic (light) layers, which have respectively higher or lower grades than the channel samples that give an average value over several dark and light layers. The averages of P_2O_5 and TiO_2 in the channel samples are respectively 1% and 0.8% higher than the averages of the grab samples. V_2O_5 grades in the channel samples are almost double the value of those reported for the NGU grab samples (average 1130 vs 640 ppm)

The collar of the lower channel 11 is close to the stratigraphic bottom of Zone B. There are approximately 5 meters of mineralised rocks SW of EOC 10, which were difficult to cut and therefore not sampled. SW of that are homogeneous felsic norites with low grades of mineralisation. This gives a total width of Zone B here of about 100 m, but with a c. 45 m lower grade/unexposed gap.

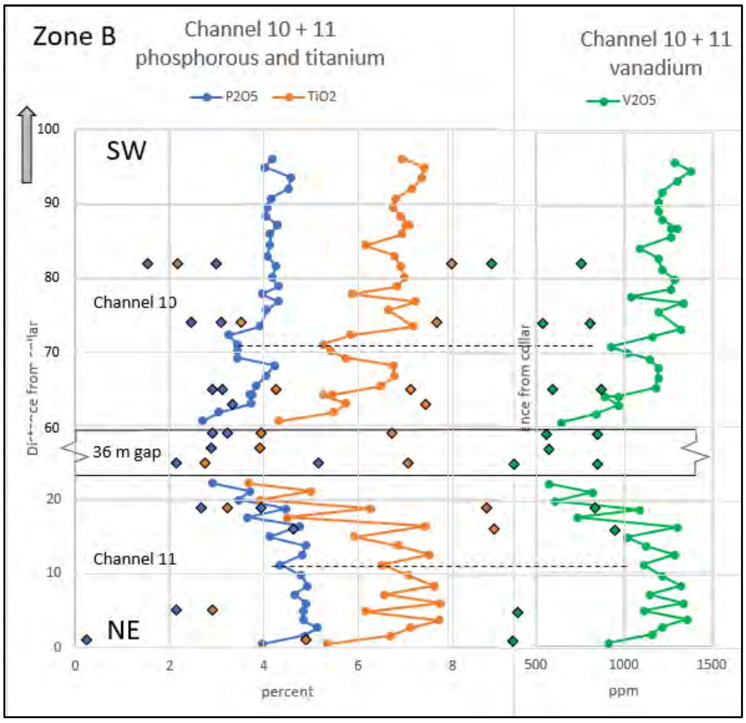


Figure 9-8 P, Ti and V grades in channels 10 and 11 at Øygrei C

Stratigraphic top is indicated by the grey arrow. Diamonds are NGU grab samples and have the same colour coding as the channel samples. Dashed lines highlight correlating peaks. Full lines are breaks.

9.7 Channel 14 – Øygrei NW (ØNW) – Zone B

The channel is sampled along a forest road, with a few small gaps in the total section. The 6 m gap in the lower part of the section is not exposed. The rocks consist overall of intensely banded gabbro-norites. Dark bands are narrow, but closely spaced. Grades are relatively consistent, but not very high. P_2O_5 lies slightly over 4%, TiO_2 between 6 and 7%, V_2O_5 is rather high, between 1000 and 1300 ppm. In contrast to all other channels, the P_2O_5 and TiO_2 peaks are inversely correlated in the top half (stratigraphically) of the section. That suggests that apatite occurs mainly in the lighter, felsic layers.

The location of the lower contact of zone B here is not exposed. It is assumed that it is not very far away from the collar of the channel. Mineralised outcrops occur c. 25 m SW of the EOC, while outcrops 47 m SW of the EOC are not mineralised. The upper contact of Zone B lies in between these two. With the distance from collar to EOC being 40 m, the total width of Zone B here is at least 65 m.

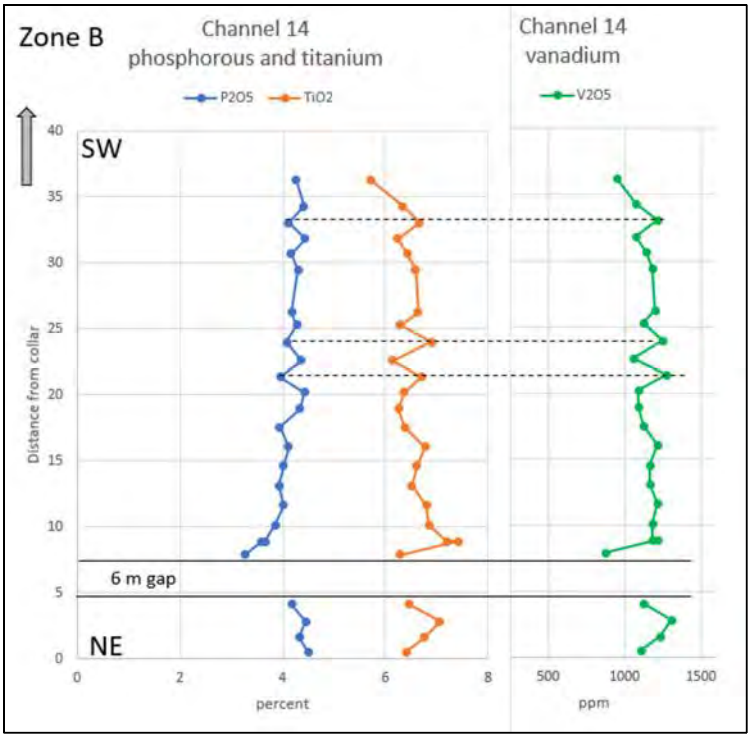


Figure 9-9 Ti and V grades in channel 14 at Øygrei NW

Stratigraphic top is indicated by the grey arrow. Dashed lines highlight correlating peaks. Full lines are breaks.

9.8 Channel 15 – Lauvneset (LAU) – Zone B

Channel 15 is sampled on well exposed rocks on the east side of Lake Teksevatnet on the peninsula named Lauvneset. These rocks are below the average water level in the lake and are only accessible at low water level. The channel includes one small offset. It is one of two channels that is collared in the stratigraphically highest part of the section. This location was also intensely sampled by NGU.

The rocks are banded norite/gabbro rocks with a relatively high proportion of dark bands. Several pegmatites cross the section. These are recognisable in the plot of Figure XX as the lower grade samples in the first meter, at 4.45 m and at 18 to 20 m and thinner pegmatites give slightly lower grades in the last two samples of the section. These also result in slightly lower average grades of channel 15. Ignoring these samples with the pegmatites, the P_2O_5 grades are rather consistent between 4.2 and 4.7%. TiO_2 grades are higher and show slightly more variation between 5.5 and 6.5%. Vanadium is less variable, with most of the grades between 700 and 1000 ppm. Although the main peaks (negative and positive) in the grade of P_2O_5 and TiO_2 largely coincide, there is not the same strict correlation of P and Ti grades as seen in the profiles of Zone C.

Eight grab samples were reported by NGU along, or within few meters from the section of channel 15. For a comparison between grab samples and channel samples the grab samples collected north of the northern end of the channel are ignored, just as the samples that contain a significant part of pegmatite are ignored. In this way P_2O_5 of the two sample sets are almost identical, with the channel samples being slightly higher. TiO_2 in the grab samples is almost one percent higher than in the channel samples. The latter is due to the fact that the grab samples were preferentially collected from the dark layers (Schiellerup et al., 2001). Vanadium measured in the grab samples is about 300 ppm lower than in the channel samples.

The collar of channel 15 is at the transition to the south to homogeneous, more leucocratic rocks. To the north (towards the stratigraphic top) the section is truncated by the lake in the northern shore of the peninsula. As seen in the western end of Lake Teksevatnet, zone B can consist of several mineralised zones. The mineralised zone here is at least 32 meters wide.

The chemistry of channel 15 is resembling channels 10, 11 and 14 and thus Zone B, especially when the pegmatite-bearing samples are taken out. In NGU's model, the mineralised rocks of Lauvneset Peninsula are part of Zone C. This issue needs to be further addressed, and it is assumed that the new, more detailed aeromagnetic data can shed a light on the lateral extension of the different zones.

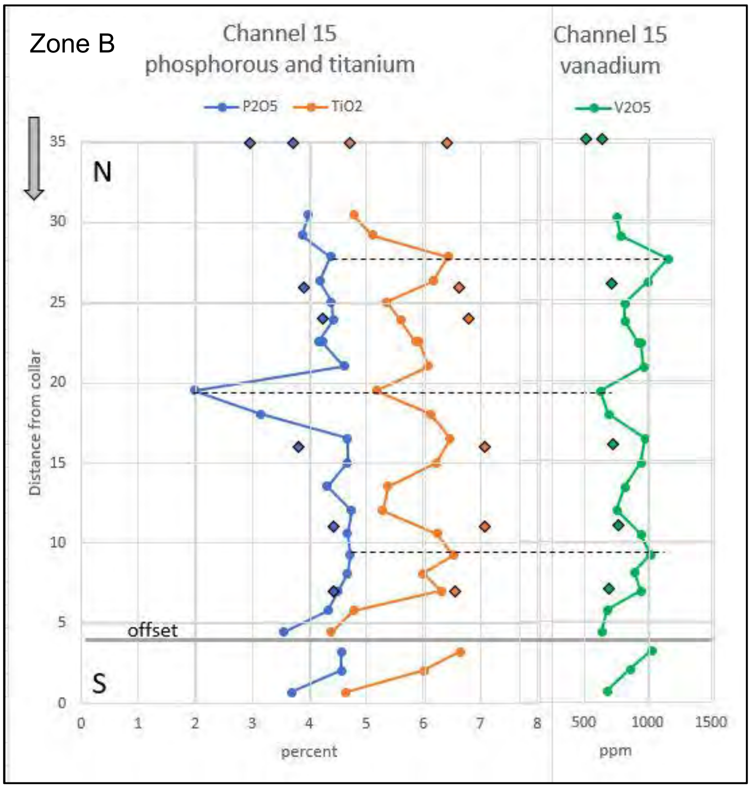


Figure 9-10 Ti and V grades in channel 15 at Lauvneset

Stratigraphic top is indicated by the grey arrow. Diamonds are NGU grab samples and have the same colour coding as the channel samples. Dashed lines highlight correlating peaks. Full grey lines mark an offset.

9.9 Channel 16 – Tekse West (TW) – NEW Zone

The channel is located on the lake shore on the southern side of Langenes Peninsula, in the eastern end of Lake Teksevatnet. The section consists of banded rocks in which the dark bands are very thin and occurring mainly in narrow zones, mainly less than one m wide, alternating with wider zones dominated by felsic rocks. Furthermore, narrow zones of alternating intermediate and felsic rocks occur. The zones dominated by intermediate rocks tend to form the high-grade samples. This configuration results in highly variable grades in the channel. P_2O_5 is consistently low, but TiO_2 varies over 5% and V varies over 750 ppm. There is a good correlation between peaks in Ti and V grades.

The channel is sampled from highest stratigraphic level in the south towards the bottom of the minerealised zone in the north.The collar of channel 16 lies close to the water line, and it is uncertain how far south the zone continues. The banded rocks sequence could be seen to continue to the south under water for some meters. The EOC coincides approximately with the last (northern-most) banded rocks in this section. The minimum width of the mineralised zone here is about 20 meters.

Note that the rocks here dipping towards the north with a dip angle of around 40°, but stratigraphic top is towards the south. The layers are thus overturned.

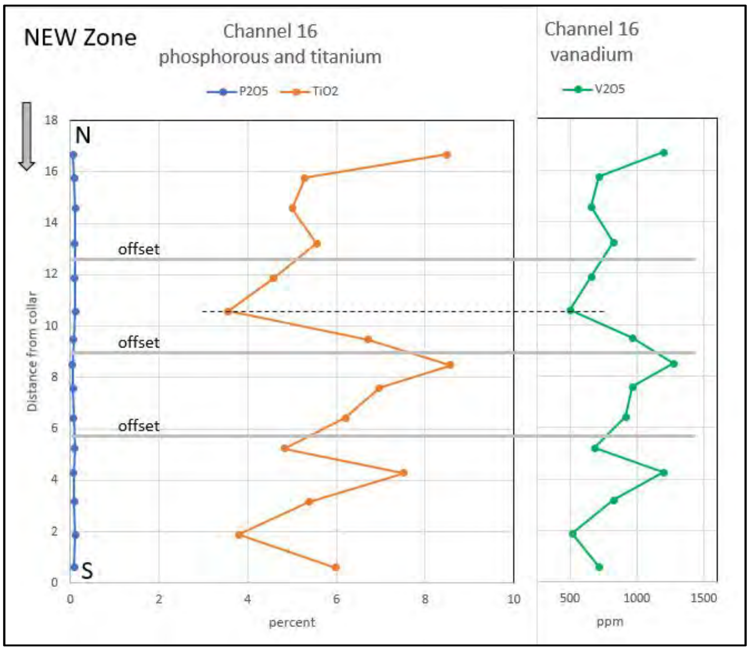


Figure 9-11 Ti and V grades in channel 16 at Tekse West

Stratigraphic top is indicated by the grey arrow. Dashed line highlights correlating peaks. Full grey lines mark offsets.

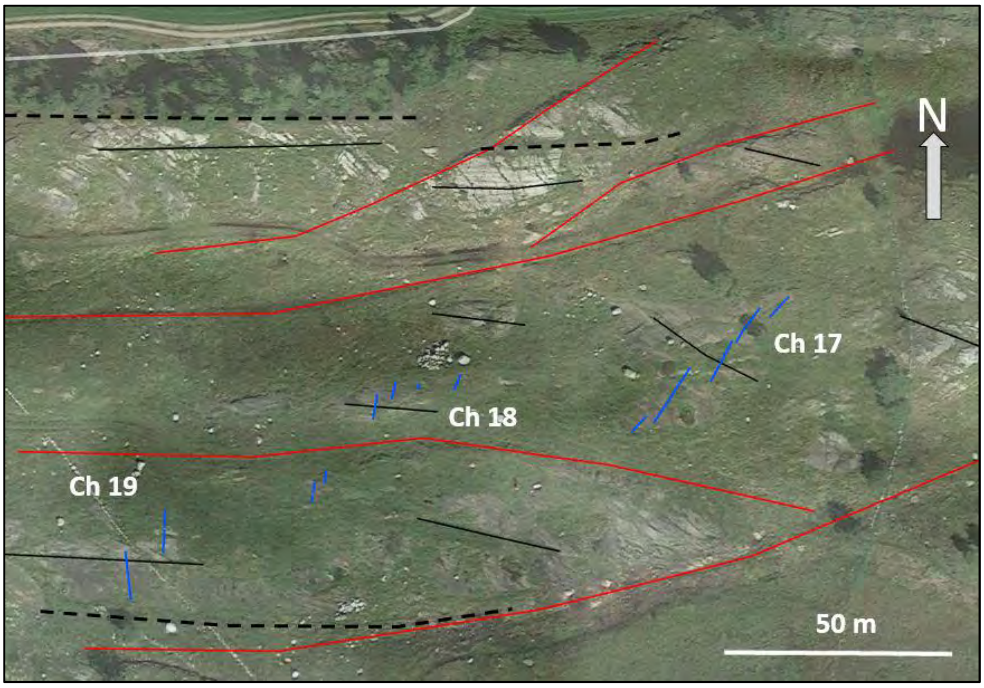


Figure 9-12 Google Earth image of Tekse East with channels and fault structures

The annotated phto shows the change in orientation of the layering. The positions of channels 17 to 19 are indicated as blue lines. Red lines are faults, black lines indicate the trend of the layering. Dashed black lines mark the northern and southern limit of intense banding.

9.10 Channels 17 to 19 – Tekse East (TE) – NEW Zone

These channels are sampled 600 to 800 m east of channel 16, inland from the lake, on a small E-W ridge. The banded rocks are highly deformed, folded and cut by faults, such that the strike of the banding varies highly in this small area (Figure 9-12). The general orientation of the strike is at an angle between 10° and 25° to the orientation of the ridge. As a result, a long section could be cut by making many offsets. Besides, there is one large gap within channel 18, and another gap between channels 18 and 19. This is the longest semi-continuous section. It was noted that especially near the end of channel 19, compass orientations are offset by about 15 degrees, as a result of the large amount of magnetite in the rocks.

The rocks are well-banded with relatively wide melanocratic and intermediate bands interlayering with thin felsic bands. Grades of TiO_2 and V_2O_5 are relatively consistent, increasing slowly towards the centre of the section, near the collar of channel 18, and then falls slightly again. TiO_2 variation from positive to negative peaks over the stretch of few meters is about 2%, V_2O_5 about 300 ppm. Peaks in Ti and V correlate well. Curiously, one small peak in the P_2O_5 grades inversely correlates with a peak in TiO_2 and V_2O_5. The peak in grade of Ti and V from 92 to 97 m coincides with the occurrence of several thick (up to 25 cm wide) dark bands.

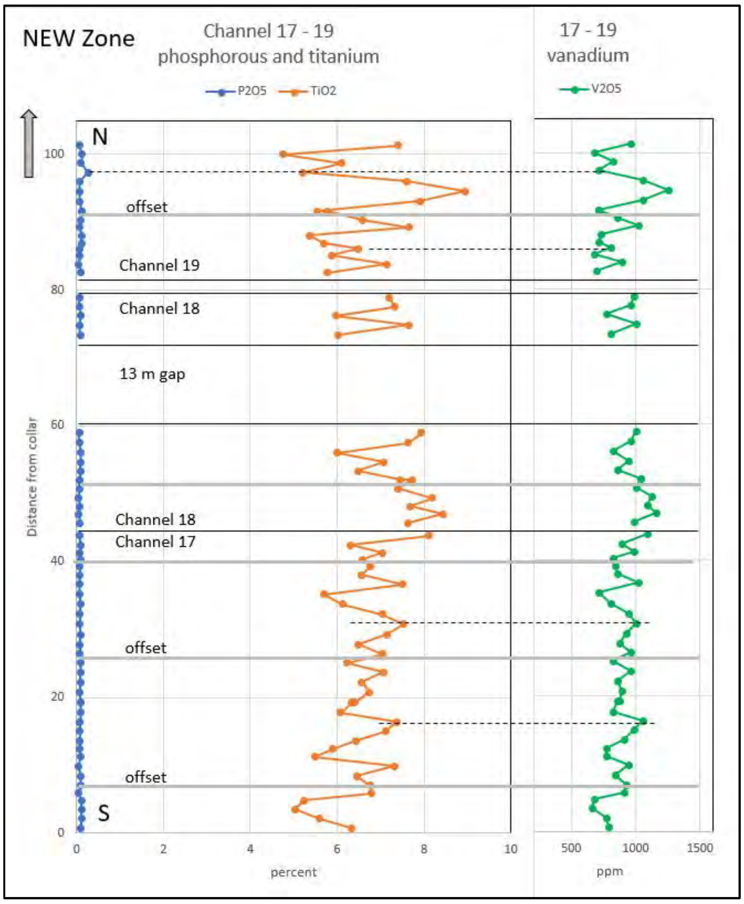


Figure 9-13 P, Ti and V grades in channels 17 to 19 at Tekse East

Stratigraphic top is indicated by the grey arrow. Dashed lines highlight correlating peaks. Full grey lines mark offsets.

The collar of channel 17 is 30m south of the bottom of the zone consisting of banded, mineralised rocks. The width of the mineralised zone, measured orthogonal to the northern and southern boundaries is c. 110 m. It is unknown what the undeformed, stratigraphic thickness of NEW Zone is at this location.

9.11 Channels 20 and 21 – Melhus S (MS) – Zone C

At Skjeraberget – 430 m NW of Øygrei farm. In the banded norite-gabbro rocks in these channels the dark bands are fairly widely spaced (10-50 cm) and overall 1-5 cm wide. Dark bands form a relatively small part of the sequence. On the other hand, the noritic background rocks are relatively rich in the three value minerals and therefore the variation in grade is relatively small. Grades increase gradually from the collar over the first seven samples. Variations in P_2O_5 and TiO_2 are overall smaller than 1%. Variations between peaks in V_2O_5 are overall smaller than 300 ppm. Peaks in the three graphs correlate very well.

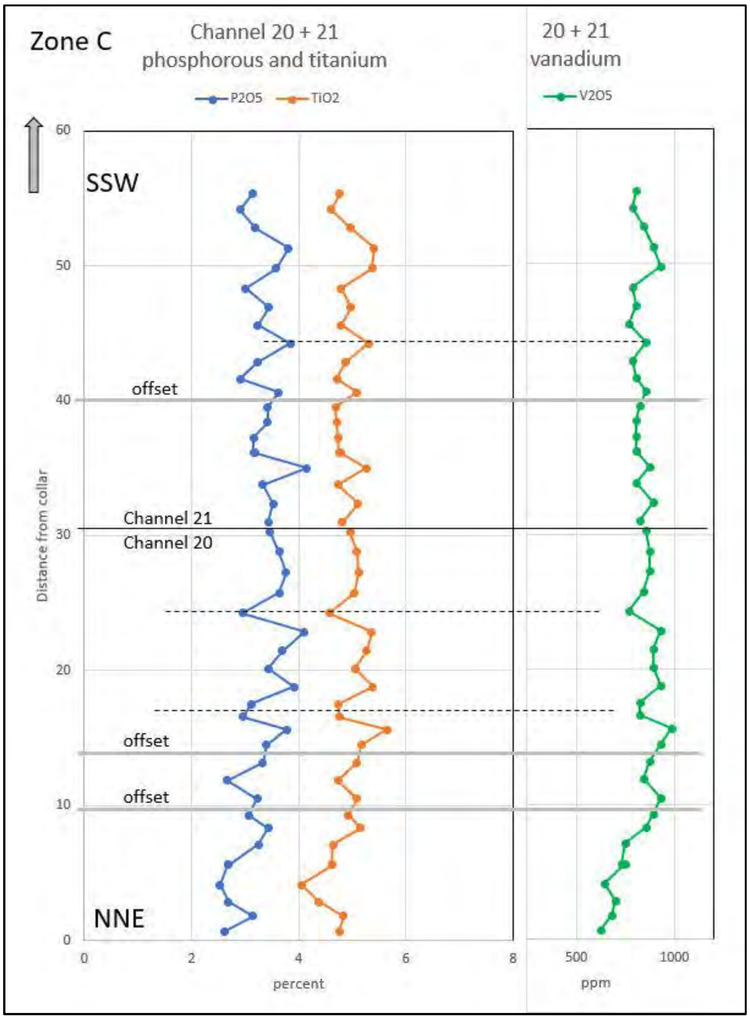


Figure 9-14 P, Ti and V grades in channels 20 and 21 at Melhus S

Stratigraphic top is indicated by the grey arrow. Dashed lines highlight correlating peaks. Full grey lines mark offsets.

The total length of the section, from Collar 20 to EOC 21, measured along the common line of the section is 67 meters. Several small gaps in the channels are ignored. Few meters NE of collar of channel 20 noritic rocks without banding and fairly low grades are exposed, indicating that the bottom of the mineralised zone is close to the collar. Mineralised, banded rocks, possibly of somewhat lower grade, are found up to about 30 m SW of EOC 21. This gives a total width of Zone C in this location of c. 100 m.

10 APPENDIX B: DETAILED RESULTS OF RECONNAISANCE EXPLORATION

10.1 Introduction

This appendix gives a detailed description of the results of the reconnaissance work, combined with interpretation of assay data (NGU grab samples and drill hole data) and the geomagnetic map. Many of the NGU geochemical data are used and presented (mostly as averages of groups of samples from the same location) as well as analyses carried out by portable XRF (pXRF).

10.2 Approach

Minimal grab samples were collected during reconnaissance; at the time of writing only two samples have been analysed while 18 more are awaiting analyses. Most information on the grade or mineral potential of the rocks was by visual estimate, field measurements of magnetic susceptibility and by use of a portable XRF analyser on outcrops.

Visual inspection: the concentration of mafic (dark) minerals in the rock and the percentage of dark bands in the rocks can give a qualitative indication of grade, as ilmenite and the vanadium carrying magnetite (both dark minerals) can be recognised. Apatite is difficult to distinguish but generally follows the presence of ilmenite and magnetite, apart from in the NEW Zone.

Magnetic susceptibility: this gives a quick and indirect, semi-quantitative measure of the amount of magnetite in the rock, and therefore of potential for vanadium. Furthermore, ilmenite content generally follows that of magnetite. As a rule of thumb, the grade of a rock was of interest when the susceptibility was near or above 100 x 10^{-3} SI. As each individual measurement takes a few seconds, an impression of the grade of a rock can be obtained within a minute using several repeat measurements over an exposed unit.

pXRF analysis: gives a relatively precise chemical analysis of a small portion of the rock in view of the analyser and therefore a quantitative measure of grade at the point of analysis. The disadvantage is that the small area that is analysed (~<1 cm^2) and therefore several repeat analyses have to be made to obtain a more representative measure of the chemistry of the rock unit. This can take 5-10 minutes at each location. It was also observed that analyses on weathered surfaces can give significantly different values compared to those on fresh rock surfaces with the latter not always possible to obtain. Where banded rocks were analysed, repeat analyses were made of light and dark bands and, where present, of intermediate rocks. Analyses collected with the pXRF are referred to in the text as pXRF analyses or pXRF grade. The majority of these analyses were carried out in the field, occasionally they were carried out on grab samples taken back to base.

GIS interpretation: the locations of the channel samples, NGU grab samples and SRK's field observations were used to determine and refine the location of the mineralised zones. By the start of the fieldwork, it was already established that in some locations the mineralised zones B and C as mapped by NGU were not located accurately in the geological map. The map (Figure 10-1) shows the new inferred traces and extents of the mineralised zones, as well as locations referred to in the text.

SRK has also used the chemical characteristics of the mineralised zones, as described in Sections 4.2 and 5.2, to evaluate their lateral extents. In the areas where correlation of the mineralised zones was questionable, grab sample chemistry and pXRF data were compared to these characteristics. This was mainly the case for correlating zones across Lakes Teksevatnet and Bilstadvatnet in the east (Figure 10-1).

In the following sections, each of the mineralised zones is discussed, starting in the area west of Teksevatnet where most of the channel sampling took place and where the geology is best known. From there each zone is "traced", first to the west and south and then to the east. NEW Zone, being the stratigraphically lowest, is the first to be discussed.

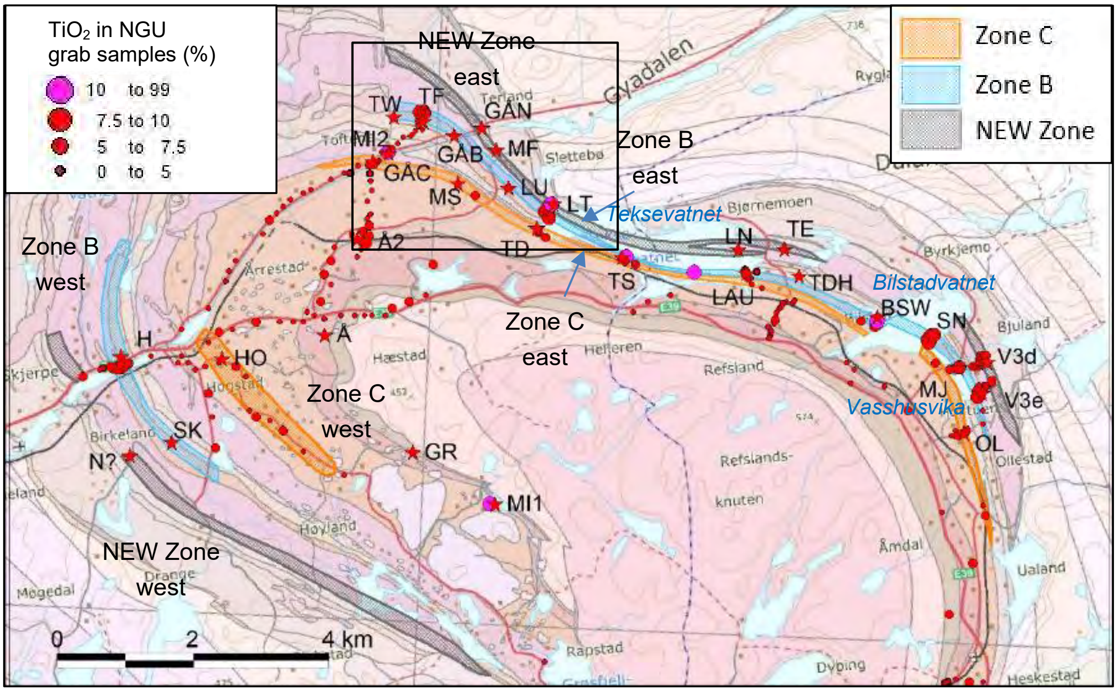


Figure 10-1 New interpretation of mineralized zones and locations referred to in the text

Red stars and acronyms mark the locations that are referred to in the text. Red and pink dots are NGU grab samples coded with TiO_2 grade. Plotted on the geological map, legend as in Figure 2-1.The black square indicates the location of Figure 10-3.

10.3 NEW Zone

After the discovery of NEW Zone at Melhus farm (MF in Figure 10-1) as an ilmenite + vanadium magnetite-bearing mineralised zone, but lacking apatite, an effort was made to trace this zone to other parts of the area. It was recognised that NEW Zone had been included in Zone B at the western end of Teksevatnet (ØY NE, or LT in Figure 10-1) in the NGU grab sample data, but not in their geological map.

Results show that rocks of NEW Zone with significant ilmenite and magnetite mineralisation can be recognised through a large part of the area, but with variable character.

- **Melhus N (or Melhus Farm, MF in Figure 10-1, sampled by channels 4-6):**

  On the "discovery hill" where channel samples 4 to 6 were collected, northwest of the farm, NEW Zone forms a c. 40 m wide zone of banded rocks. More banded rocks may occur underneath the gravel road east of discovery hill – based on observations of a second zone in the road section some 300 m to the NW (see below).

  It should be noted that in a zone of homogeneous rocks that is at least 90 m wide, southwest of the zone of banded rocks, Ti and V appear to be slightly elevated. Average pXRF grade of TiO_2 is 4.2% (which is relatively low, but well above background) while V_2O_5 is relatively high at an average of 1034 ppm. Apatite is virtually absent.

  On the higher parts of the hill east of "discovery hill" is a poorly defined zone of vaguely banded rocks that is at least 70 m wide. pXRF data indicate moderate to average grades of 3.8% TiO_2 and 759 ppm V_2O_5, but with a narrow zone with grades 4-4.5% TiO_2 and 900-1350 ppm V_2O_5. This needs further investigation.

Tracing NEW Zone to the west:

- North of the Gyaåna river (GÅN in Figure 10-1), there are two zones of magnetite and ilmenite-bearing rocks in the road section 50 and 33 m wide. The wider band correlates with the channel-sampled discovery hill at Melhus Farm, the narrower zone to the east would correspond to an (unobserved) similar zone east of that hill (e.g. underneath the gravel road). Grades measured by pXRF, compared to the lab results for the channel samples at Melhus N, are similar for TiO_2 and significantly higher for V_2O_5. Average, low and high pXRF values are:
    - TiO_2 - 5.7% (min 2.8% and max 7.7%, with one outlier at 11.7%);
    - P_2O_5 – low;
    - V_2O_5 - 1280 ppm (min 400 ppm, max 2500 ppm);
- Six hundred metres north of Terland Farm (TF in Figure 10-1) are several narrow zones with good banding and pXRF grades comparable to those in the road section shown in Figure 10-2 (TiO_2 average 5.7%, V_2O_5 average 1133 ppm). The level of exposure is poor and it is uncertain how large a volume of the total rock these banded zones occupy;

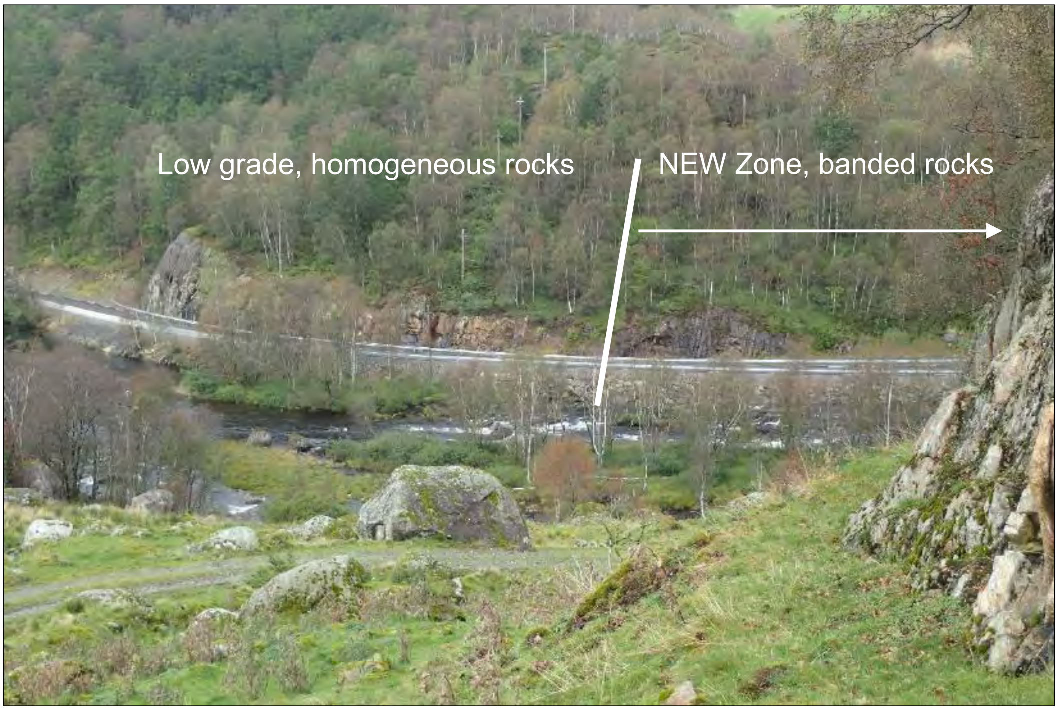


Figure 10-2 Road section at Gyaåna river north of Melhus Farm

Dark rocks on the right-hand side of the exposure are part of NEW Zone north of the river. They represent the western, 50 m wide zone. The narrower zone to the east is off the photo to the right. The gravel road in the left of the photo may cover the SE extension of this second (eastern) mineralised zone south of the river. Looking north.

- West of the exposure of Zone B in the Helleland road section (H in Figure 10-1) and in the hills up to 500 m north of the road, similar banded rocks were encountered in the same stratigraphic level as NEW Zone near Melhus and Terland farms. Exposure is poor; this area has not been investigated thoroughly and no pXRF analyses were taken. However, the observations suggest that NEW Zone continues in this area. One NGU sample taken along the road (sample LF024.99) contains 5.6% TiO_2 and low P_2O_5, thus confirming the potential continuation of the Ti mineralisation of NEW Zone.

- The fold hinge area between Terland and Helleland has not been visited. The geological map shows continuity of the stratigraphic level that hosts NEW Zone (MCU-IIId) through the fold hinge. That suggests that mineralisation could continue here. This is in contrast with the stratigraphic level of Zone B that does not seem to continue in the fold hinge, but is highly disturbed by a Jotunitic dyke (Figure 2-1).
- Several locations further south of Helleland look promising in satellite imagery; banded rocks can be recognised locally, but these have not yet been investigated. It should also be noted that about 1 km southeast of the location where rocks reminiscent of NEW Zone were observed west of Helleland, is the start of a strong, linear magnetic anomaly at the stratigraphic level of NEW Zone (N? in Figure 10-1). This magnetic anomaly and the stratigraphic level continue to the southeast for over 6 km to the south-east. The magnetic anomaly then continues for another three kilometres beyond the point where the stratigraphic level terminates in the geological map. SRK has visited one location in the south where this anomaly crosses a road but found no mineralisation. This needs to be investigated more thoroughly and is a target for future exploration.

The distance between NEW Zone and Zone B increases from Lake Teksevatnet to the west. This distance is

- at the lake: 30 m
- at Melhus farm: 90 m (uncertain)
- at Gyaåna river: 170 m
- north of Terland: 500 m

This may be a result of the onlap of the layers onto an original high in the magma chamber as discussed in section 2.4. This will also have repercussions in the case of mining. Near Lake Teksevatnet the two zones (NEW and B) could potentially be mined in a single open pit. This will not be possible where the distance between the two increases.

NEW Zone east of Melhus Farm:

- Between Melhus farm and Lake Teksevatnet (MF and LT in Figure 10-1) to the southeast, a distance of 1.1 km, are several small outcrops of similarly banded rocks, suggesting the continuity of the zone between these two locations. Both banded rocks and homogeneous rocks occur here, indicating that NEW Zone consists of several narrow mineralised zones interlayered with lower-grade zones. No pXRF data are available of the outcrops between the farm and the lake,but magnetic susceptibility measurements indicate elevated magnetite mineralisation;
- Teksevatnet West (Øygrei N) – northwest corner (LT in Figure 10-1, sampled by channels 7-9, 12 and 13, see Section A.4 for more details). Banded rocks with grades similar to those at Melhus farm occur discontinuously over a zone of c. 115 m width. The banded rocks are interlayered with more felsic, homogeneous, lower grade rocks. Large gaps in exposure make it difficult to establish how much of this width is actually mineralised but, of the exposed parts, 51 m is mineralised and was sampled. About 30% is not exposed, the remainder is homogeneous, more felsic and has lower grades.

This width of 115 m is significantly greater than at Melhus farm (40 m) or at Gyaåna (83 m);

- Langenes (LN in Figure 10-1) is the peninsula in the east of Lake Tekesvatnet on which channel 16 was sampled (Tekse West). The peninsula consists of interlayered zones of banded rocks and more homogeneous, felsic (light) to intermediate rocks. Apart from channel 16, in which grades are highly variable, but on average moderate to low (Section A.8), no chemical data are available. Magnetic susceptibility is locally high in some of the banded rocks. The banded zones are 5 to 15 m wide, the one at channel 16 being amongst the widest. At the eastern end of the peninsula, the strike of the layering is towards the northwest, at a high angle to the overall strike of the zone;
- Tekse East (TE in Figure 10-1, channels 17-19, see Section A.9 for more details). Banded rocks of NEW Zone occur over at least 110 m measured across-strike. Grades in the channels are moderate and apatite is effectively absent. Large directional changes in the bandings strike are also seen at the channel sample location (Figure 9-12). The banded rocks appear to continue to the ESE rather than east along the general strike of the zone. Directly east of the sampled zone of banded rocks (along the assumed strike of the zone), rocks are more homogeneous with very thin dark bands and overall very low magnetic susceptibility (<100 x 10^{-3}) compared to that of the sampled rocks (100 – 200 x 10^{-3});
- Tekse drill hole (TDH in Figure 10-1). An unpublished NGU drill hole, 430 m SE of channels 17-19, has moderate Ti grades and low P and V grades (averages: 3.5% TiO_2, 0.2% P_2O_5 and 220 ppm V) which suggests that this is outside the mineralised zones; No observations were made and no NGU grab samples exist between Tekse East and Vasshusvika (next section);
- NGU samples from stratigraphic level UMC-IIId east of Lake Vasshusvika, referred to in Table 5-3 and Section 5.2 as Vasshusvika 3d (V3d in Figure 10-1, east of the Mjåsund drill hole) from Korneliussen et al. (2001) have a NEW Zone chemical fingerprint. A series of 15 samples along a curved E-W section, plus five more samples collected 350 m further south, have grades between 5 and 7% TiO_2 (average 5.4%), and very low P_2O_5 (average 0.14%). There is no data for vanadium. These samples are assumed to be on the south-eastern extension of NEW Zone. These grades are slightly lower than those in NEW Zone near Lake Teksevatnet, but the eastern 9 samples from the profile of 15 samples have on average a slightly higher grade, as reported in Table 5-3. The whole zone with elevated Ti grades is about 200 m wide (true width). This area was not visited by SRK and needs to be included in future reconnaissance work.

Potential for NEW Zone-equivalent mineralisation at MCU IV-d.

The mineralisation of NEW Zone occurs in stratigraphic level MCU III-d, below Zone B. The equivalent stratigraphic level in MCU IV could have potential for mineralisation as well. This would mean that another mineralisation level could occur between Zones B and C. In the area that is best investigated, west of Lake Teksevatnet, no such mineralisation has been observed. This is neither the case east of Lake Teksevatnet, but this area has not been investigated thoroughly, and poor exposure prohibits this to some extent. On the other hand, on the south shore of Teksevatnet, two NGU grab samples with respectively 12.4 % and 11.0 % TiO_2 and 0.2% and 1.2 % P_2O_5 just north of (i.e., stratigraphically below) Zone C could indicate mineralisation similar to NEW Zone here. This has not been investigated by SRK. Furthermore, in the southern limb of the trough, a strong linear magnetic anomaly at the stratigraphic level MCU IV-d could imply high levels of magnetite in the rocks here and possibly associated ilmenite mineralisation. This area has not been investigated, and only one NGU grab sample is known from this stratigraphic level. This sample, collected 650 m east of Storeknuten (SK in Figure 10-1 and Figure 10-4) at the margin of the magnetic anomaly contains 5.1% TiO_2 and 0.04 % P_2O_5 and could indicate the existence of and additional mineralised zone here. An investigation of Google earth images shows that a location 2 km SE of the sample location could have exposed banded rocks. Because of the high uncertainty of this zone, it is not shown in the maps as a potential mineralised zone.

10.4 Zone B

Zone B as defined by NGU stretches over 2.6 km in the west near Helleland (Zone B west) and about 2.8 km between Terland and Teksevatnet (Zone B east), with a 4.5 km gap in the hinge zone between Terland and Helleland (Figure 10-1). There is a small disagreement between the position of Zone B west of Lake Teksevatnet as mapped by NGU and as interpreted by SRK. The new interpretation is based on results of NGU's grab samples as well as field observations by SRK. This has led to a small shift in the position of the mineralised at Teksevatnet West (Øygrei C, between TD and LT in Figure 10-3), at the site of channel 14 (Øygrei NW, location LU in Figure 10-3) and at Terland (TF and TW in Figure 10-3). Zone B lies between 50 and 100 m (or more) further NE (stratigraphically downwards) than shown in the NGU's geological map (Figure 10-2). Also at Helleland, mineralised rocks occur up to 150 m west (stratigraphically down) from where they are shown in the NGU map (Figure 10-4). These inaccuracies have little implications for the mineralisation itself but needs to be recognised when planning for drill holes and when assessing the impact of any future infrastructure developments.

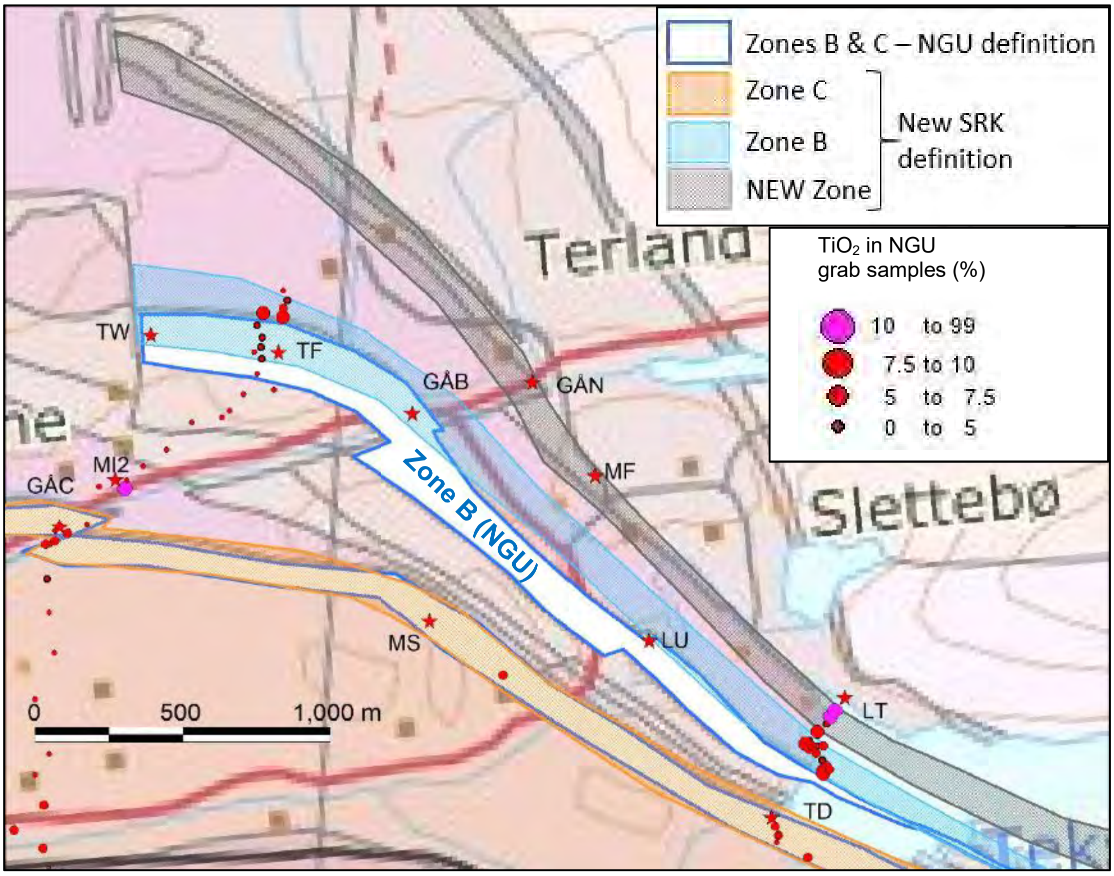


Figure 10-3 Shifted position of Zone B west of Lake Teksevatnet

The position of NGU's zone B is misplaced by 50-200 m. Note that the position of the NGU grab samples is in agreement with SRK's new interpretation. Red stars and acronyms mark the locations that are referred to in the text. Red and pink dots are NGU grab samples coded with TiO_2 grade. Plotted on the geological map, legend as in Figure 2-1.

- Zone B is well exposed at low water levels on the shoreline of Teksevatnet West (150-250 m south of the location marked LT in). During fieldwork in the spring of 2019 the water level was unusually low, allowing channel sampling at a level that is normally under water for much of the year. The zone here is about 100 m wide with a 45 m lower-grade gap (Figure 9-8). Rocks in the gap are reasonably well exposed. pXRF measurements and susceptibility measurements suggests that grades in this gap are lower and decrease from the sampled parts of the zone towards the gap (Figure 9-8). However, NGU analyses suggest that some rocks occur in the gap that have grades comparable to that in the well layered zones on either side;

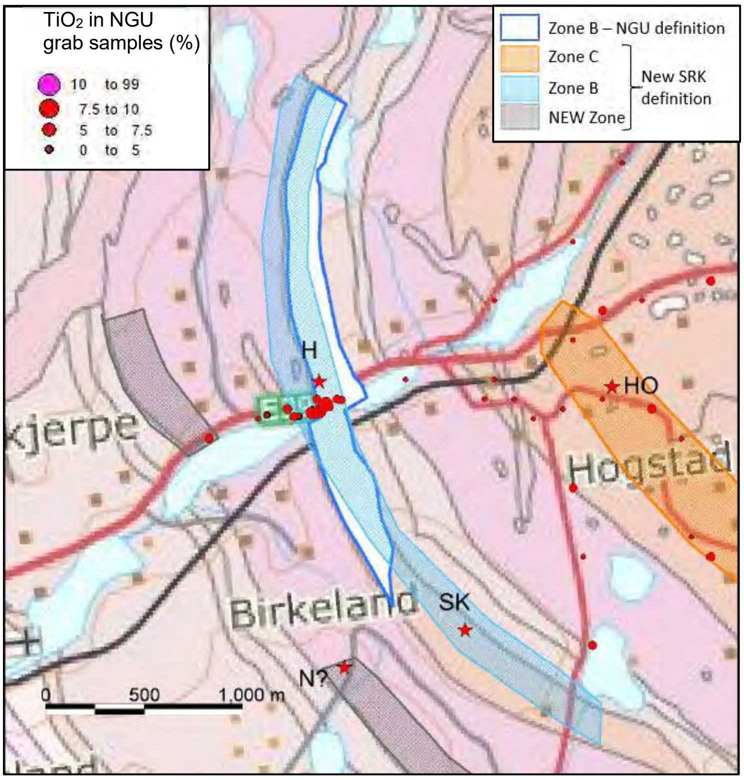


Figure 10-4 Shifted position of Zone B at Helleland

The position of NGU's zone B is misplaced by 50-150 m. Note that the position of the NGU grab samples is in agreement with SRK's new interpretation. Red stars and acronyms mark the locations that are referred to in the text. Red and pink dots are NGU grab samples coded with TiO_2 grade. Plotted on the geological map, legend as in Figure 2-1.

Tracing Zone B to the northwest and west:

- East of the hill named Lusiknuten (LU in Figure 10-2), at the site of channel 14 (Øygrei NW) between Lake Teksevatnet and Melhus Farm, banded rocks occur with grades that are typical for Zone B. The channel is 37 m long but banded rocks are recognised over 90 meters (measured across the mineralised zone) and the mineralised zone is open-ended to the NE. Up to 150 m SE of the channel, banded rocks with high magnetic susceptibility (100-200 x 10^{-3}) are observed, indicating continuity along strike;
- Zone B has not been recognised anywhere between Lusiknuten and Gyaåna (resp. LU and GÅB in Figure 10-3). There are a few narrow bands with minor mineralisation but no sign of the 100 m wide Zone B with intensely banded rocks. It is possible that a narrow, mineralised zone lies underneath the paved secondary road in this area, but this only covers a width of about 10 m and none of the outcrops close to the road show banding or mineralisation of elevated grade. It is unclear what has happened to Zone B in this area but it appears to be absent over a distance of slightly more than 800 m;
- In the road outcrop at Gyaåna (GÅB in map Figure 10-1), an 81 m wide zone (open ended on either side due to lack of outcrop) is observed with moderately elevated P, Ti and V grades but moderate magnetic susceptibility (<80 x 10^{-3}). This zone is in the extension of where Zone B is expected to intersect the road, but it could extend further east into an unexposed area. The rocks are not banded but predominantly homogeneous and felsic (light) and include an 11 m wide zone with a dark gabbroic rock (high P and Ti) and a 5 m wide fine-grained, low-grade intermediate to dark rock with high susceptibility. These rocks are not typical for Zone B;

Average grades in this location, based on pXRF analyses, are:

- 2.4% TiO_2;
- 6.4% P_2O_5;
- 964 ppm V_2O_5 (omitting two analyses on rocks with V below detection limit);

These are surprising results because in every analysis on rocks in this location P_2O_5 is of a higher concentration than or equal to TiO_2, which is in contrast to all other observations in Zone B. Whereas the presence of apatite indicates that this is the proper stratigraphic horizon for Zone B, the rocks and their composition are not typical of mineralized Zone B. This suggests that mineralisation is heterogeneous in character in this section of Zone B.

This observation of a relatively high-grade rock that is not banded suggests that the homogeneous rocks south of the river (where Zone B could not be identified in the field) may also constitute Zone B, or its equivalent. No rocks from here were analysed. This needs further investigation;

- Terland Farm (TF in Figure 10-3): This is approximately along strike of the road outcrops, but the trend of the banded rocks is starting to swing to the west. Zone B here is obviously shifted c. 80 m north with respect to its location in the NGU map. Rocks, unlike those in the road cut, are well banded with narrow (5–10 m) felsic zones alternating with mafic layers. The well-banded rocks occur within a zone of c. 120 m wide. In the banded rocks, the mafic layers form a high percentage of the rock.
pXRF analyses were made on mafic, felsic and intermediate rocks and gave averages of:

- 5.1% TiO_2 (min 1.4% and max 9.2%);
- 2.6% P_2O_5 (min 0.3% and max 5.3%);
- 1224 ppm V_2O_5 (min 421 ppm and max 2226 ppm);

In all analyses but one, TiO_2 grades are higher than P_2O_5 (opposite to that observed in the road outcrops at Gyaåna) which is “normal” for Zone B. In contrast, there is a 2-3% difference in TiO_2 grade between the dark and light bands, which is significantly smaller (0.5-1.0%) for P_2O_5. Vanadium grades also differ significantly, by 500-1000 ppm between light and dark layers, being highest in the dark, magnetite-rich layers;

Eigth NGU grab samples from the same area have average grades that are comparable to the average grades for TiO_2 and P_2O_5 measured by pXRF, but the V_2O_5 grade is considerably lower than the grades measured by pXRF. The average grades of the NGU samples are:

- 5.8% TiO_2 (min 4.17% and max 8.9%);
- 3.3% P_2O_5 (min 2.8% and max 4.3%);
- 728 ppm V_2O_5 (min 559 ppm and max 900 ppm);

The rocks at Terland show many signs of a dynamic intrusive system with troughs, truncation of layering and slump folds (Figure 10-5), suggesting intrusion during active tectonism. As mentioned above, this is in accord with a local concentration of mafic cumulate minerals (ilmenite and magnetite).

Towards the north (i.e., moving out of the mineralized zone), the P_2O_5 grade drops significantly, while TiO_2 and V_2O_5 are still elevated. This is the transition to the lower stratigraphic layer (MCU III-d) at the bottom of which NEW Zone occurs.

Figure 10-5 Slump fold in the magmatic layering at Terland farm

- Terland West (TW in Figure 10-3): This is where Zone B is truncated to the west. The nature of this truncation needs to be investigated more thoroughly to evaluate the possibility of the continuation of Zone B to the west after a fault offset. At this location, Zone B is more than 150 m further north than as shown on the NGU map. The zone of mineralised rocks is about 200 m wide from north to south and includes both banded and more homogenous rocks of intermediate composition which have high magnetic susceptibility, indicating that it may carry grade;

  Analysed rocks (pXRF) contain on average:
    - 5.5% TiO_2 (min 1.0% and max 8.0%);
    - 4.8% P_2O_5 (min 1.35% and max 9.3%);
    - 1422 ppm V_2O_5 (min 943 ppm and max 1937 ppm);

  One grab sample from here of a mafic mineralised rock was analysed in the ALS laboratory and contains:
    - 6.0% TiO_2;
    - 3.1% P_2O_5;
    - 1303 ppm V_2O_5;

  The laboratory result is similar to the averages of the pXRF analyses. Difference in grade between dark and light bands is similar or larger than at Terland but the P_2O_5 grade varies significantly more here.

- Helleland (H in Figure 10-4): Zone B continues here and is well exposed in a road section along the E39. Grades of grab samples are shown in Table 5-3. Zone B is truncated to about 1.6 km north of the road. The road outcrop at Helleland is clearly described by Schielerup (2001). At this location, Zone B is at least 200 m wide, but lies 50 to more than 100 m west of where it is mapped by NGU. In the NGU maps it continues for 800 m south of the river. But rocks up to at least 800 m south of Storknuten (SK in Figure 10-4) are strongly banded and have high magnetic susceptibilities. This extends Zone B at least 1.2 km further south than in the geological map. No pXRF data are available from here. Three grab samples from near

Storeknuten were submitted for analysis in the laboratory, and results are pending. These are the southernmost confirmed mineralised rocks of Zone B.

Continuing Zone B further east from Lake Teksevatnet is a point of discussion. As detailed in Section 5, the NGU maps show that Zone B mineralisation is discontinuous and stops in the lake. The stratigraphic layer MCU-IIIe, which hosts Zone B, is supposed to continue east of Lake Teksevatnet as a very thin layer, without the high-grade mineralisation. The mineralised zone east of the lake is by NGU mapped as Zone C (MCU-IVe; Figure 2-1). The chemistry of the mineralised rocks east of Lake (except those at Ollestad) is more characteristic of Zone B than of Zone C. If the mineralised rocks immediately east of Teksevatnet are indeed Zone C, it would mean that the chemistry of Zone C rocks has changed over the southern shore of the lake, and then changes back again over 500 m between the two drill holes at Mjåsund and Ollestad (MD and OL in Figure 10-1). This is geologically unlikely, and therefore it is assumed that Zone B continues east of the lake (Figure 5-3). This theory requires confirmation by further investigations with the SRK model for the lateral extent of the mineralised zones being based on this hypothesis that most of the mineralisation east of Lake Teksevatnet constitutes Zone B.

- Lauvneset (LAU in Figure 10-1) location of channel 15 (see Section A.7 for more details). Field observations of these banded rocks show that they are overall more mafic than the rocks of Zone C, west of the lake. This is confirmed by the chemistry that is more similar to that of Zone B. South of the collar of channel 15 follows a c. 10 m zone that is lower grade, followed again to the south by an area lacking exposure. On the south shore of Lauvneset peninsula, two mineralised samples are reported by NGU (Figure 10-1). This could suggest that Zone B in this location consists of two mineralised zones separated by a low grade zone of unknown width, similar to the situation at the west end of Teksevatnet, channels 10 and 11 which is separated by a lower-grade gap of 36 m. But the chemistry of the two samples makes it more likely that these two samples represent Zone C (see discussion below).

  Based on the chemical composition of the drill hole samples and grab samples collected in locations further east and southeast from Lauvneset, Zone B is assumed to continue here as shown in the map of Figure 10-1.

- Bilstadvatnet SW and Storneset, two locations on respectively the western and eastern shore of Lake Bilstadvatnet (BSW and SN in Figure 10-1). Both locations were sampled by NGU and the assays have a chemistry that places them in Zone B (Table 5-3, Figure 5-2).
- Mjåsund drill hole (MJ in Figure 10-1– NGU data). This 30 m deep hole was drilled by NGU at a small angle to the layering, intersecting only c. 10 meters of the stratigraphy. NGU reports that this drill hole represents mineralised Zone C. But the chemistry is very similar to that of zone B as shown in Table 5-3 and Figure 5-2. A single NGU grab sample collected here has also Zone B composition (26.1% Fe_2O_3, 7.5% TiO_2, 4.45% P_2O_5).
- Vasshusvika 3e (V3e in the map) is the southernmost location where a group of NGU samples has a chemistry that is clearly similar to Zone B (Table 5-3 and Figure 5-2). The continuity of the Aeromagnetic anomaly south of here suggests that rocks with a high magnetite grade continue. Possibly, the mineralisation continues underground and does not reach the surface.

10.5 Zone C

During reconnaissance only a few observations were made of Zone C outside the three channel sample target areas. Additional to SRK's observations, some of the NGU sample data has been used to evaluate the extent of Zone C.

- Teksestemmen Dam (TD in Figure 10-3): The rocks of Zone C are well exposed at the western and southern shores of Lake Teksevatnet at low water levels. This is the location of channel 01 (Øygrei S, see Section A.1 for more details). A new road that was built during fieldwork to access the dam provides a good new section parallel with the sampled channel, well above the water line. Good exposure of Zone C exists at several locations along the gravel road from the dam to Harald Ogreid's farm. Along this road two sections were cleared for channel sampling, the eastern section for channels 02 and 03, and a western section, nearer the main road. The latter section was not sampled due to the irregular shape of the surface of the exposed rock, presenting sampling difficulties, and its low priority within the programme.
- From Øygrei SW to Melhus South (MS in Figure 10-3) are several outcrops of banded rocks that suggest continuity of Zone C here. Well-exposed banded rocks with high magnetic susceptibility occur between approximately 80 and 180 m north of Harald Ogreid's farm (350 m SE of Melhus S location). No pXRF data are available for this location, but the observations confirm that Zone C continues in a similar style from channel 01 through channels 02 and 03 along the farm to channels 20 and 21.

  In contrast to the NGU mapping of Zone B, there is no ground for major adjustments of the trace of Zone C in the geological map. The main adjustments west of Lake Teksevatnet are at the lake shore (Øygrei S), where the northern boundary of Zone C needs to be moved at least c. 30 m further north than indicated in the NGU map and the southern boundary is moved 20 m south. Otherwise the boundaries are accepted more or less as they are, because no new data are available for adjustment.
- Gyaåna (at GÅC in Figure 10-3) is assumed to be well exposed in the road cut along the river (not visited by SRK). These road cuts are relatively new and could provide access to good outcrop of Zone C that was not available at the time of NGU work. Seven NGU grab samples from along the road have the Zone C geochemical fingerprint and moderate grade:

  These grab samples contain on average:

  - TiO_2 - 5.0% (min 4.0% and max 6.1%)
  - P_2O_5 - 2.9% (min 2.0% and max 3.6%)
  - V_2O_5 - 676 ppm (min 661 ppm and max 691 ppm, only two analyses of V)

  Northwest of Melhus S the zone has not been observed during SRK reconnaissance, and it is assumed to terminate NW of Gyaåna as indicated on NGU geological maps.

Tracing Zone C towards the east of Øygrei.

- Several NGU grab samples with Zone C chemical characteristics were collected on the south shore of Lake Teksevatnet (TS in Figure 10-1 and east thereof). East of Teksevatnet most of the NGU sampled rocks have been re-designated by SRK as Zone B. NGU samples on the southern shore of Lauvneset Peninsula (LAU in Figure 10-1) south of the newly designated Zone B on the peninsula, have a Zone C fingerprint. Between Lake Teksevatnet and Ollestad bedrock exposure is poor and the eastern continuation of Zone C is uncertain. Only one NGU grab sample, collected 360 m WNW of the Mjåsund drill hole location, is reported. This has a Zone C fingerprint (16,8% Fe, 5.3% TiO_2 and 3.1% P_2O_5), however, single samples do not provide solid evidence for the distinction between Zone B & C due to their similarities and internal, across-strike variation.

- Ollestad (OL in Figure 10-1). A single drillhole was drilled to 30 m depth by NGU in the eastern part of the area at Ollestad. This hole was oriented at a high angle to the layering and intersected 28 m of the stratigraphy. NGU proposed that this drillhole sampled Zone C, and this is confirmed by the chemical fingerprint of the sample analyses (Table 5-3, Figure 5-2). The grades from the Ollestad drill core are on average:
    - TiO_2 - 4.5% (min 3.2% and max 4.9%)
    - P_2O_5 - 3.6% (min 2.5%, max 4.2%)
    - V_2O_5 - 701 ppm (min 509 ppm, max 835 ppm)

  Surface grab samples (NGU) at Ollestad have an average composition that is very similar to that of the drill core. The grade of Zone C here is significantly lower than the grade of Zone B, exposed at Vasshusvika and intersected in the Mjåsund drill hole. Two single NGU grab samples collected c. 1 km further south at the same stratigraphic level indicate that mineralisation may continue southwards.

The combined observations that the chemistry of the drillholes and surface samples at Mjåsund and Ollestad are similar to those in respectively Zone B and Zone C suggest that both zones exist as parallel mineralised zones in the east of the area. This is in contrast with NGU's interpretation which shows an offset of Zone C in Lake Vasshusvika in order to intersect the mineralisation at both Mjåsund and Ollestad. This ignores the samples with Zone B chemical fingerprint in the SE corner of Lake Vasshusvika. Although for the economic aspects of the project it is less important whether the mineralised rocks east of Teksevatnet are designated as Zone B or Zone C, the new interpretation of the data could suggest that two parallel mineralised zones could exist, thus increasing the volume of mineralised rocks.

Tracing zone C to the southern part of the intrusion – Zone C West.

- In the south-western part of the layered intrusion (the southern fold limb) Zone C is not present as mineralised zone according to the NGU. However, at Hogstad (HO in Figure 10-4) and southeast of there, in the stratigraphic level that is equivalent to Zone C in the northern limb (MCU IV-e), several moderate-grade Ti, P and V-bearing rocks have been sampled by NGU and by SRK over 2.2 km. The mineralised zone lies approximately 280 m above the base of MCU IV-e and the width is unknown. The stratigraphic layer is truncated to the southeast by large anorthosite inliers and therefore can be no longer than 3.2 km in strike (measured from the river near Helleland, H in Figure 10-4). To the northwest and north of Helleland this stratigraphic level is disturbed by the Jotunitic dyke that disrupts the layers in the fold hinge. The aeromagnetic map gives no indications for continuation of Zone C through the fold hinge.

  NGU (10) grab samples from near Hogstad have average grades:
    - TiO_2 4.3% (min 1.7% and max 7.3%)
    - P_2O_5 2.7% (min 0.9%, max 3.8%)

  SRK (3) grab samples have average pXRF grades:
    - TiO_2 5.6% (min 5.3% and max 6.0%)

- P_2O_5 6.5% (min 6.0%, max 7.4%)
- V_2O_5 735 ppm (min 700 ppm, max 781 ppm)

The SRK grab samples are not really representative for the whole zone because they were collected from the best mineralised parts of the outcrops. They are anomalous in as much as the P_2O_5 grades are equal to or higher than the TiO_2 grades which is only seen elsewhere at Gyaåna within Zone B.

pXRF readings on an outcrop of banded norite/gabbro rocks nearest the hinge zone:

- TiO_2 4.3% (min 1.5% and max 7.3%)
- P_2O_5 3.7% (min 1.1%, max 7.2%)
- V_2O_5 1090 ppm (min 719 ppm, max 1728 ppm)

These readings show a slightly lower grade in Ti and P, but significantly higher V. It should also be noted that all grab samples and pXRF results are from close to the main paved road and no outcrops at a larger distance from the road were sampled. IE., this zone has not been investigated properly.

10.6 Other targets

There are several more targets that can be pursued. They include extensions of the stratigraphic units which host the known mineralisation, but also previously unknown mineralisation at other stratigraphic levels. Specifically, NEW Zone has been underexplored and the eastern part of the area has only received cursory attention during reconnaissance by SRK.

The mineralised Zone C in NGU's definition contains the lowest levels of the stratigraphic unit MCU IV-e that show clear banding. The higher levels (towards the core of the fold) of this unit still contain the three economic minerals (apatite, ilmenite and vanadium-bearing magnetite) at low to moderate grades. This lower grade part of the stratigraphic unit is between c. 100 m and 500 m wide (true width, after subtracting 100 m for the more mineralised Zone C). There are sporadic moderate to high-grade samples (NGU grab samples) and pXRF analysis (SRK) form this unit, but these seem to occur only in small pockets or lenses. One example (Å in Figure 10-1) is from a single outcrop along the gravel road south of Årrestad, 350 m south of the E39, where pXRF data from a 5 m wide gabbroic rock show average grades of 6.0% TiO_2, 7% P_2O_5 and 657 ppm V_2O_5 (five measurements). This rock could not be traced along strike because of lack of exposure. Few similar occurrences were found by SRK but can also be recognised in the NGU sample database. Especially in the southern part of the intrusive body, this zone is highly disturbed by anorthosite inclusions, the largest of which are kilometres in size, making it unlikely to discover continuous mineralised units here.

Grøning –stratigraphic unit UMCIV-f (GR in Figure 10-1). East of Grøning farm in the south-central part of the area, relatively high-grade rocks occur in a small rock quarry. The rocks are rusty, fairly homogeneous and rather dark (gabbroic). Average grades measured by pXRF (11 measurements) in this location are:

- TiO_2 7.0% (min 2.6% and max 10.6%)
- P_2O_5 5.7% (min 1.1%, max 8.1%)
- V_2O_5 653 ppm (min below detection limit, max 1100 ppm)

A single sample from this quarry was assayed by the ALS laboratory:

- TiO_2 - 7.2%
- P_2O_5 - 3.9%

- V_2O_5 - 143 ppm

450 m west of here, in a small outcrop along the gravel road, similar grades were measured by pXRF.

During a brief field visit in September 2019 an attempt was made to evaluate the extent of this moderate/high grade rock type. The observations made at this time led to the conclusion that this is an area of mixed rock types, mostly intrusive rock of the same suite, some of which are relatively high grade with lenses of barren anorthosite inclusions. These anorthosites are more resistant against weathering and stand out as small hills, on the edges of which other rock types are exposed in narrow strips. Consequently, these other rock types are poorly exposed. It is therefore not very clear how extensive the moderate/high grade rock units are. This target requires further investigation.

Felsic, elevated vanadium grade rock at Grøning

180 m north-west of the Grøning quarry, in the stratigraphically higher unit named Transition Zone (transition to rocks with granitic compositions) is a homogeneous, felsic noritic/charnockitic rock with unusually high vanadium grades. Magnetic susceptibility and Fe grades are relatively low, and thus magnetite grade is low. Therefore, the magnetite here is assumed to be exceptionally rich in vanadium. Ti and P grades are also low. Average pXRF measurements on these rocks are (7 measurements):

- Fe_2O_3 - 11.28%
- TiO_2 - 2.2% (min 1.0% and max 3.7%)
- P_2O_5 - 1.3% (min 0.6%, max 1.9%)
- V_2O_5 - 2088 ppm (min 1466 ppm, max 3196 ppm)

These rocks were traced about 30 meters across strike, but outcrop patterns observed from a distance suggest that this rock type continues several tens of meters more uphill to the north (across strike). This needs to be investigated further.

Årrestad

Another target that has not yet been investigated by SRK is a group of moderately high grade NGU grab samples c. 1 km NNE of Årrestad (Å2 in Figure 10-1). These samples are situated at approximately the same stratigraphic level as the Grøning high-grade rocks at the transition from MCU IV-e to MCU IV-f stratigraphic unit. The highest grab sample results are 7.7%TiO_2 and 2.4% P_2O_5 (no V data), while most samples vary between 5-6% TiO_2, and 2-3% P_2O_5. This trend appears to continue along the geological contact to the southwest. Towards the east, this contact is obscured by the railway line, the river and the E39 highway.

High grade magnetite + ilmenite outcrops

Within the project area, two outcrops with anomalously high Ti and Fe grades are known. The first is located 1.4 km east of the Grøning quarry is a layered rock in an outcrop with a 1-1.5 m wide layer with extreme high magnetite-ilmenite content (marked with MI1 in Figure 10-1). Susceptibility levels here are up to 1400 x 10^{-3} SI, which is five times higher than the highest measurement elsewhere in the area. No pXRF measurements were taken but an NGU grab sample (Schiellerup et al, 2001) that appears to be collected from the same outcrop contains:

- Fe_2O_3 - 47.8%
- TiO_2 - 24.8%
- P_2O_5 - 0.01%
- V_2O_5 - not available

This is a relatively small outcrop (ca. 10x2 m), and no similar rocks were found in the vicinity by SRK. But Schiellerup et al. (2001) refer to observations by B. Robins of similar rocks about 100 m along strike to the south which SRK interpret to be to the east-southeast. The high Ti-Fe outcrop is associated with a small aeromagnetic anomaly that extends a few hundred meters ESE of this high magnetite + ilmenite occurrence. Therefore, it is likely that there is some continuation of these rocks in that direction.

A similar high Ti and Fe outcrop is reported by Schiellerup et al. (2001) beside the road along Gyaåna (MI2 in Figure 10-1). A single NGU grab sample reports grades of:

- Fe_2O_3 - 48.5%
- TiO_2 – 37.1%

There is no magnetic anomaly associated with this occurrence, and no similar rocks are reported in the vicinity. It is assumed that this is a smaller anomalous occurrence.

No other similar occurrences are known in the area, and these are assumed to be local exceptions. However, in the north-eastern and eastern part of the intrusive body several magnetic anomalies occur in the higher stratigraphic level of the layered sequences. This area was not visited by SRK, but three NGU samples from this zone (Korneliussen, 2001) show moderate grades of TiO_2 around 5.8% and P_2O_5 of 2.5-2.8%. Initial modelling of the magnetic data suggested that the magnetic bodies that are the sources of these geophysical anomalies could be blind, not outcropping at the surface.

11 APPENDIX C: MINERALOGICAL REPORT - PETROLABS

Petrolab
Mineralogy · Petrography

Ilmenite-Magnetite-Apatite Ore

Wardell Armstrong International Ltd

Mineralogical Report AM3398a 05/11/2019

Petrolab Ltd | www.petrolab.co.uk
tel +44 (0)1209 219 541 **email** petrolab@petrolab.co.uk
C Edwards Offices, Gweal Pawl, Redruth, Cornwall TR15 3AE
Registered in England & Wales · Company No. 4777735

Contents

List of figures

Petrolab document control			
Client	Wardell Armstrong International Ltd		
Report title	Ilmenite-Magnetite-Apatite Ore		
Analysis required	Liberation study and manual SEM analysis.		
Client reference	WAI19764	**Client contact**	Garfield Stuart <gstuart@wardell-armstrong.com>
Report ID (version)	AM3398a 05/11/2019	**Version note**	Report Initial Issue
Prepared by	C Brough PhD CGeol	**Checked by**	J Fletcher BSc MSc
	M Zając BSc MSc		

Limitations
This report relates only to those samples submitted and specimens examined and to any materials properly represented by those samples and specimens. This report is issued to the Client named above for the benefit of the Client for the purposes for which it was prepared. It does not confer or purport to confer on any third party any benefit or right pursuant to the Contracts (Rights of Third Parties) Act 1999.

Background

Scope

Three samples were supplied by Wardell Armstrong International Ltd for detailed mineralogical investigation. They were reported to be prospective ore samples from Bjerkreim project and Petrolab was requested to characterise the bulk mineral deportment of the samples and to undertake a detailed particle liberation study. Ancillary scanning electron microscopy (SEM) point-and-shoot analysis was also undertaken to determine Ti and V values for magnetite, titanomagnetitie and ilmentite.

This report presents the findings from automated mineral analysis on three samples. Each sample was analysed as four size fractions (as received). Results for the parent sample were back-calculated based on the proportional mass split between the fractions.

Comprehensive Automated Mineralogy Chart (AMC) data from the analyses are provided in the accompanying Excel™ application file[1], *Petrolab_AMC3398a_Bjerkreim_issued_01-11-19.xlsm, w*hich should be viewed in conjunction with this report.

Samples / fractions

Sample / fraction	Type	Date received	Mass split (%)
Bjerkreim New Zone			
Bjerkreim New Zone +1mm	Metallurgical test	01/10/2019	50.1
Bjerkreim New Zone +500µm	Metallurgical test	01/10/2019	30.4
Bjerkreim New Zone +250µm	Metallurgical test	01/10/2019	9.4
Bjerkreim New Zone -250µm	Metallurgical test	01/10/2019	10.2
Bjerkreim Zone B			
Bjerkreim Zone B +1mm	Metallurgical test	01/10/2019	44.5
Bjerkreim Zone B +500µm	Metallurgical test	01/10/2019	18.5
Bjerkreim Zone B +250µm	Metallurgical test	01/10/2019	15.5
Bjerkreim Zone B -250µm	Metallurgical test	01/10/2019	21.5
Bjerkreim Zone C			
Bjerkreim Zone C +1mm	Metallurgical test	01/10/2019	49.6
Bjerkreim Zone C +500µm	Metallurgical test	01/10/2019	18.0
Bjerkreim Zone C +250µm	Metallurgical test	01/10/2019	14.0
Bjerkreim Zone C -250µm	Metallurgical test	01/10/2019	18.4

1 AMC data application requires Excel 2010 or later with macros enabled to function correctly. Charts include:
- Bulk Mineral Abundance
- Elemental Deportment
- Cumulative Size Distribution
- Mode of Liberation
- Theoretical Grade vs Recovery
- Theoretical Mineral Recovery by Particle Size
- Particle Association
- Particle Type
- Gravity Profiles

Methods of investigation

Automated mineralogy

Quantitative mineralogical analysis using ZEISS Mineralogic Mining[1] - a product for automated mineral characterisation based on scanning electron microscopy - was requested.

A polished block was prepared from each of the submitted sample/ fractions and carbon coated to a thickness of 10 nm. Each block was analysed using a ZEISS EVO MA 25 scanning electron microscope (SEM)[2] fitted with two Bruker xFlash 6|60 x-ray detectors for energy-dispersive X-ray spectroscopy (EDX) analysis. The Mineralogic Mining 1.6 software controlled the SEM and acquired morphology and X-ray data.

A phase classification scheme was developed using the Mineralogic Mining software. Delineating grains into different phase classes is achieved by matching criteria that compare the quantitative measurements of elemental composition, as determined from the ED spectrum, with standard mineral composition data[3]. A mineral group name or a general name (after dominant elements) is used for a class where there is a range in the elemental composition data such that a specific mineral member cannot be separately identified.

Reporting of phase / mineral data is in terms of weight percent. However, all data acquired is from 2D sections of 3D particles. Mass values are derived from measurement of particle / grain areas, with no correction for stereological error, and an assumed phase density.

Additional notes on the chosen Mineralogic mode of analysis are provided in the preamble to each related section of the automated mineralogy results.

SEM analysis

As with the automated analysis the prepared sample was analysed using a ZEISS EVO MA 25 scanning electron microscope (SEM)[4] fitted with two Bruker xFlash 6|60 x-ray detectors for energy-dispersive X-ray spectroscopy (EDX) analysis. 20 points were analysed from each sample focussed on magnetite and ilmenite. A long acquisition time was used to improve the detection levels for elements present at low levels (e.g. vanadium).

Analysis details

Liberation mapping mode was utilised, as analysis was undertaken to determine the overall abundance of major / minor phases, grain/particle sizes and locking characteristics.

Liberation mapping mode acquires data from each particle, particles with edges touching the border guard frame are discarded (and thus allows for a greater accuracy of liberation data and particle size data as only complete particles are included).

1 ZEISS Mineralogic Mining combines a mineral analysis engine with a scanning electron microscope and energy dispersive spectrometers to provide automated analysis and is manufactured by Carl Zeiss Microscopy Ltd.
2 SEM system located at Petrolab Ltd, Redruth, UK.
3 The identification of a mineral or mineral group is based on a best match with the acquired chemical data and no additional verification of its presence has been obtained (unless stated otherwise).
4 SEM system located at Petrolab Ltd, Redruth, UK.

Sample / fraction	ZEISS Mineralogic Mining analysis details	Petrolab ID#
Bjerkreim New Zone		
Bjerkreim New Zone +1mm	2x polished slice · Liberation mode 21/10/19 · 23 µm map · Mag. x48 · 203 particles · Min. analysis ~1600 µm².	13540
Bjerkreim New Zone +500µm	2x30 mm polished block · Liberation mode 17/10/19 · 20 µm map · Mag. x55 · 531 particles · Min. analysis ~1000 µm².	13541
Bjerkreim New Zone +250µm	1x30 mm polished block · Liberation mode 15/10/19 · 10 µm map · Mag. x55 · 558 particles · Min. analysis ~200 µm².	13542
Bjerkreim New Zone -250µm	1x30 mm polished block · Liberation mode 11/10/19 · 5 µm map · Mag. x111 · 641 particles · Min. analysis ~50 µm².	13543
Bjerkreim Zone B		
Bjerkreim Zone B +1mm	2x polished slice · Liberation mode 21/10/19 · 23 µm map · Mag. x48· 207 particles · Min. analysis ~1600 µm².	13545
Bjerkreim Zone B +500µm	2x30 mm polished block · Liberation mode 17/10/19 · 20 µm map · Mag. x55 · 515 particles · Min. analysis ~1000 µm².	13546
Bjerkreim Zone B +250µm	1x30 mm polished block · Liberation mode 14/10/19 · 10 µm map · Mag. x55 · 651 particles · Min. analysis ~200 µm².	13547
Bjerkreim Zone B -250µm	1x30 mm polished block · Liberation mode 11/10/19 · 5 µm map · Mag. x111 · 656 particles · Min. analysis ~50 µm².	13548
Bjerkreim Zone C		
Bjerkreim Zone C +1mm	2x polished slice · Liberation mode 21/10/19 · 23 µm map · Mag. x48 · 211 particles · Min. analysis ~1600 µm².	13550
Bjerkreim Zone C +500µm	2x30 mm polished block · Liberation mode 17/10/19 · 20 µm map · Mag. x55 · 508 particles · Min. analysis ~1000 µm².	13551
Bjerkreim Zone C +250µm	1x30 mm polished block · Liberation mode 14/10/19 · 10 µm map · Mag. x55 · 581 particles · Min. analysis ~200 µm².	13552
Bjerkreim Zone C -250µm	1x30 mm polished block · Liberation mode 11/10/19 · 5 µm map · Mag. x111 · 652 particles · Min. analysis ~50 µm².	13553

Reporting

Conventions

A tabulated value of 0.0 in the accompanying spreadsheet data indicates the mineral phase or element was detected in the sample/ fraction but with a value beneath the reporting precision, whereas a missing value in a table indicates the mineral phase or element was not detected in that particular sample/ fraction.

Any mineral present with an abundance of less than 0.1% may not be encountered by standard runtime analysis, whereas minerals present with a true abundance of 0.1% or more are likely to be encountered.

Particle statistics

The estimation of error within the analysis of modal mineralogy, and by extension textural mineralogy, is based around the theoretical work that went in to estimating error in point-counting, and in particular how many points need to be recorded to reduce the error to acceptable margins. As with any analysis by random sampling, sample preparation is critical as if particles are not randomly distributed, or representative of the source material, then there is an additional source of error, that won't be removed by analysing more particles.

For the estimation of error it is assumed that samples received are representative splits of the material as sampled. In addition, every care was taken to ensure that sample preparation was not biased by density settling or inadvertent dissolution of target phases.

The calculation of error is derived from Howarth, 1998 and references therein. In particular, equation (11) from that paper (itself derived from Blyth, 1986), the measure of error, can be used to calculate the number of particles that need to be analysed to reduce that error to an acceptable margin. Reversing that process allows the calculation of error to be derived based on the number of grains analysed for any given phase.

The formula from Blyth (1986) estimated the error for the upper bound and lower bound corresponding to counts in the range;

$$p(n) = 100[1/N] \text{ to } p(n) = 100\{(N – 2)/N]$$

Within this range the upper and lower bounds on the estimate are given by;

$$p(n)^u = 100[BETA(1 – \alpha, n + 1, N – n)]$$

$$p(n)^l = 100[1 - BETA(1 – \alpha, n + 1, N – n)]$$

Where, N = number of grains analysed, n = number of target phases, α = confidence limit around that estimation and BETA is a statistical function.

From these formulae the calculation of the relative error, and range in absolute values can be given for any target phase based on the number of occurrences and calculated modal proportion. These values are presented in the table below.

Sample	Ilmenite Particle Statistics			
	Ilmenite Occurrence	Modal Proportion (%)	Range (%)	Relative Error (%)
Bjerkreim Samples				
Bjerkreim New Zone	1,180	11.1	±0.3	3
Bjerkreim Zone B	1,500	12.4	±0.3	2
Bjerkreim Zone C	844	8.1	±0.3	3
Note: The estimation of relative error and range on modal proportions is based on 95% confidence limits.				

Sample	Magnetite Particle Statistics			
	Magnetite Occurrence	Modal Proportion (%)	Range (%)	Relative Error (%)
Bjerkreim Samples				
Bjerkreim New Zone	776	4.7	±0.2	5
Bjerkreim Zone B	1,318	6.6	±0.2	3
Bjerkreim Zone C	724	5.0	±0.2	4
Note: The estimation of relative error and range on modal proportions is based on 95% confidence limits.				

Sample	Apatite Particle Statistics			
	Apatite Occurrence	Modal Proportion (%)	Range (%)	Relative Error (%)
Bjerkreim Samples				
Bjerkreim New Zone	72	0.2	±0.1	25
Bjerkreim Zone B	2,224	8.4	±0.2	3
Bjerkreim Zone C	1,334	7.1	±0.3	4
Note: The estimation of relative error and range on modal proportions is based on 95% confidence limits.				

Sample	Titanomagnetite Particle Statistics			
	Titanomagnetite Occurrence	Modal Proportion (%)	Range (%)	Relative Error (%)
Bjerkreim Samples				
Bjerkreim New Zone	1,464	0.4	±0.1	17
Bjerkreim Zone B	4,227	1.2	±0.1	8
Bjerkreim Zone C	1,447	0.5	±0.1	15

Note: The estimation of relative error and range on modal proportions is based on 95% confidence limits.

The key investigation findings from automated mineral analysis of the samples begins over-page and consist of phase classification, bulk mineral analysis, and selected observations and remarks regarding element deportment, liberation and locking association data for target mineral phases.

Report key findings

Classification scheme

Target mineral	SG[1]	Typical composition / Group minerals
Ilmenite	4.7	$FeTiO_3$
Magnetite	5.2	Fe_3O_4
Apatite	3.2	$Ca_5(PO_4)_3F$
Titanomagnetite	5.2	$Fe(Fe,Ti)_2O_4$
Gangue mineral	**SG**	**Typical composition / Group minerals**
Plagioclase feldspars	2.6 - 2.8	Predominantly anorthite, see notes below.
Orthopyroxene	3.9	Ferrosilite $(Fe^{++},Mg)_2Si_2O_6$
Clinopyroxene	3.4 - 3.6	Predominantly diopside $CaMgSi_2O_6$, trace hedenbergite $CaFe^{++}Si_2O_6$
Chlorite	2.6	$(Mg,Fe)_5Al(AlSi_3O_{10})(OH)_8$, see notes below.
Fe Oxides	4.2 - 5.3	Hematite Fe_2O_3, goethite FeOOH
Biotite	3.0	$K(Mg,Fe)_3AlSi_3O_{10}(OH,F)_2$
Amphibole	3.0	Predominantly actinolite $Ca_2(Mg,Fe^{++})_5Si_8O_{22}(OH)_2$, see notes below.
Fe Sulfides	4.2 - 5.0	Predominantly pyrite FeS_2, trace pyrrhotite $Fe_{1-x}S$ | x = 0 – 0.17 and chalcopyrite $CuFeS_2$
Titanite	3.5	$CaTiSiO_5$
Accessory Phases	2.6 - 4.0	Accessory phases include: see notes below.

Notes on classification

- Magnetite and ilmenite were analysed using point-and-shoot scanning electron microscopy for vanadium and titanium content. Ilmenite doesn't contain any vanadium. Typical vanadium values in magnetite range between 0.55 % V in New Zone to 0.62 % V in Zone B. Exsolution textures were commonly observed during point-and-shoot analysis and these likely relate to variations in Fe and Ti content.
- Titanomagnetite also contains trace pseudorutile and ulvospinel. Ulvospinel and titanomagnetite usually form exsolution textures in magnetite.
- Plagioclase feldspars group also contains trace amounts of albite, orthoclase and microcline.
- Chlorite also includes trace amounts of Ti-Chlorite, Mg-Chlorite and Fe-Chlorite.
- Amphibole also includes some richterite, which is a sodic amphibole that may form asbestiform habits.
- Accessory phases include quartz, ilvaite, hercynite and gibbsite.

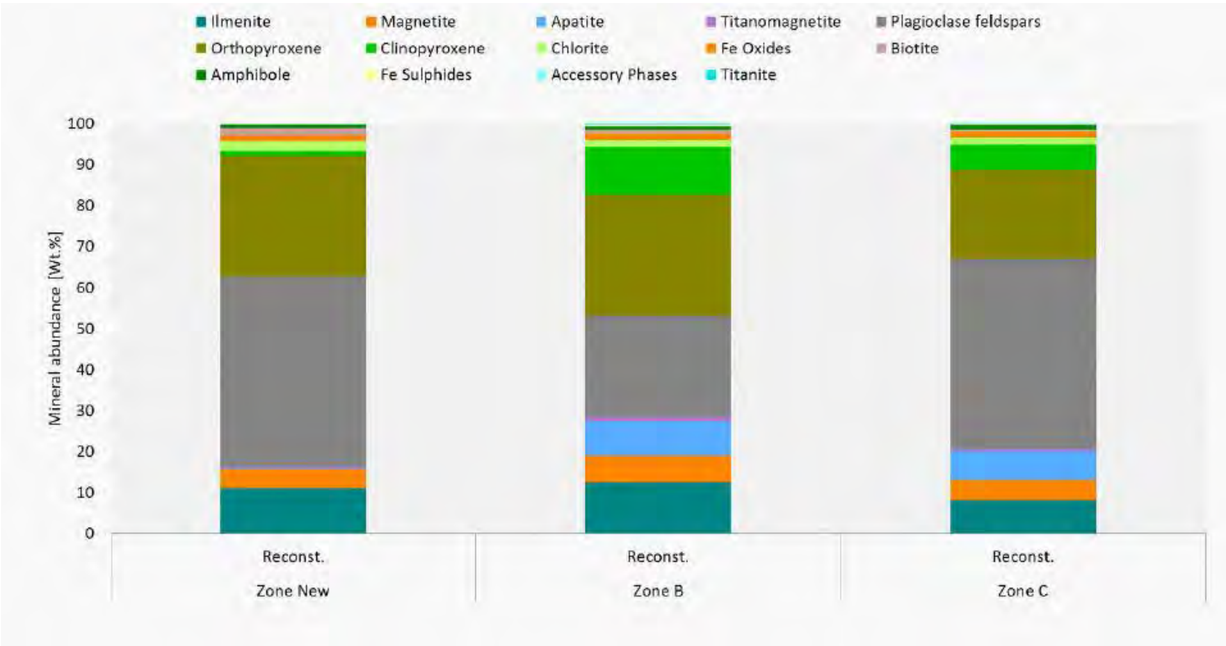
1 Typical mineral composition and s.g. data used for calculation of abundance by mass from webmineral.com or as otherwise estimated.

Bjerkreim ores - automated mineralogy

Bulk mineralogy

The target phases include ilmenite, magnetite, apatite and titanomagnetite. The amount of ilmenite is similar in samples New Zone and Zone B and it is slightly lower in sample Zone C. The amount of magnetite is similar in all samples and varies from 4.7 wt% in sample New Zone to 6.6 wt% in sample Zone B. There is a distinct difference in apatite abundance across the samples. Sample New Zone contains only trace apatite (0.2 wt%), while samples Zone B and Zone C comprise 8.4 wt% and 7.1 wt% apatite respectively. Titanomagnetite occurs in trace amounts in samples New Zone and Zone C with slightly higher abundance in sample Zone B (1.2 wt%). The main gangue mineral phases in all samples are plagioclase feldspars (predominantly anorthite) and orthopyroxene (mainly ferrosilite) with trace to major clinopyroxene. There are also minor amounts of chlorite, Fe oxides, biotite, amphiboles and trace Fe sulphides, titanite and accessory phases.

Figure 1: Phase abundance for samples Zone New, Zone B & Zone C



Deportment

Four elements were reported for deportment which were Fe, P, Ti and V, all of which were also analysed for by whole rock assay, which was provided by client. The comparison between the reconstructed grades and the whole rock elemental assay are close with few exceptions, with the automated mineralogy overestimating values slightly on the Fe. (Figure 2)[1]. The V values obtained by manual point-and-shoot analysis are slightly lower than assay values.

For the relative deportment Fe is predominantly hosted in ilmenite and magnetite (> 50% of the sample Fe). One third of sample Fe is hosted in orthopyroxene. Fe oxides, chlorite, titanomagnetite, clinopyroxene, amphibole and biotite are other minor hosts of Fe. Assay values measured by XRF are between 11.9 - 15.9 %Fe for all three samples, with the reconstructed values from the automated results between 12.8 - 18.8 %Fe.

For vanadium, magnetite hosts > 95% of the samples vanadium with the remainder hosted by titanomagnetite. Assay values measured by XRF are 0.058 %V for all the samples, with the reconstructed values for the automated results coming out 0.04 %V. Measured automated assay values for V are lower in Zone C and New Zone. The discrepancy in V values can be caused by the low concentration of vanadium in all samples, therefore have higher relative errors of estimation during standard analysis.

For titanium ~95% is hosted by ilmenite with a further 3 - 4 % hosted by titanomagnetite. There is also trace titanium in biotite and Ti-chlorite. Assay values measured by XRF are 3.6 %Ti which is very similar to the automated results at 3.7 %Ti.

Figure 2: Comparison of assay values analysed by XRF and by automated mineralogy

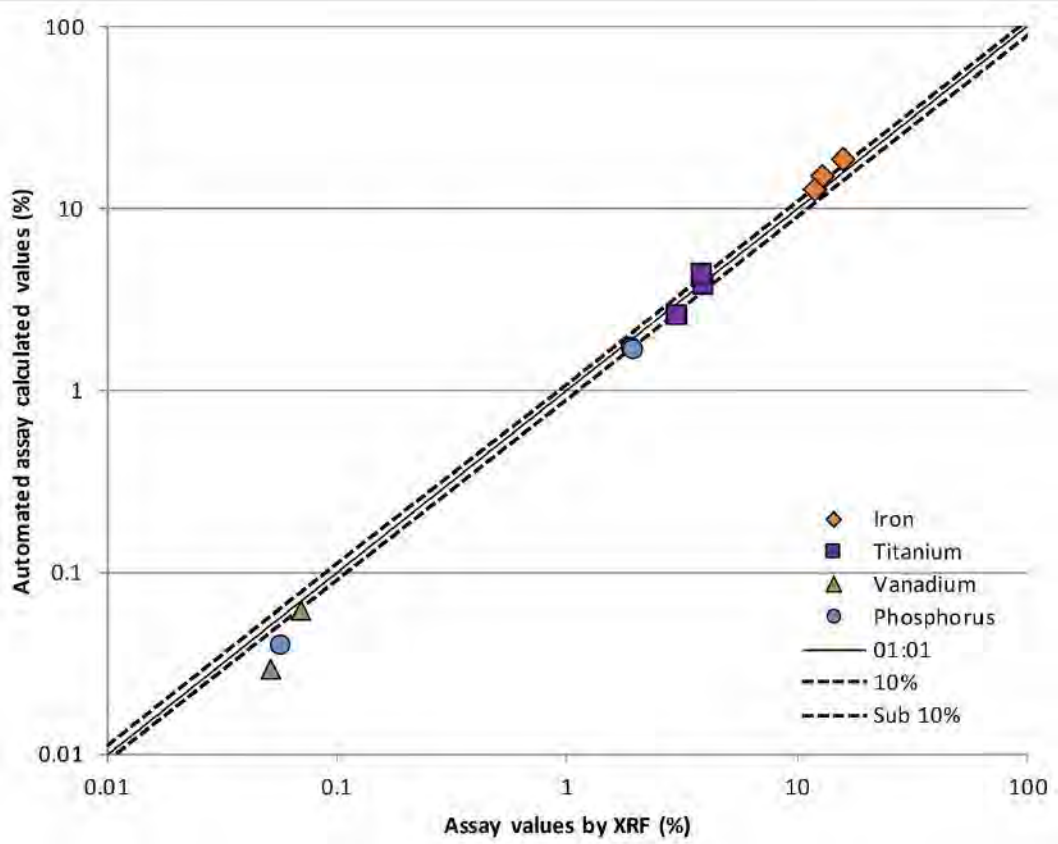
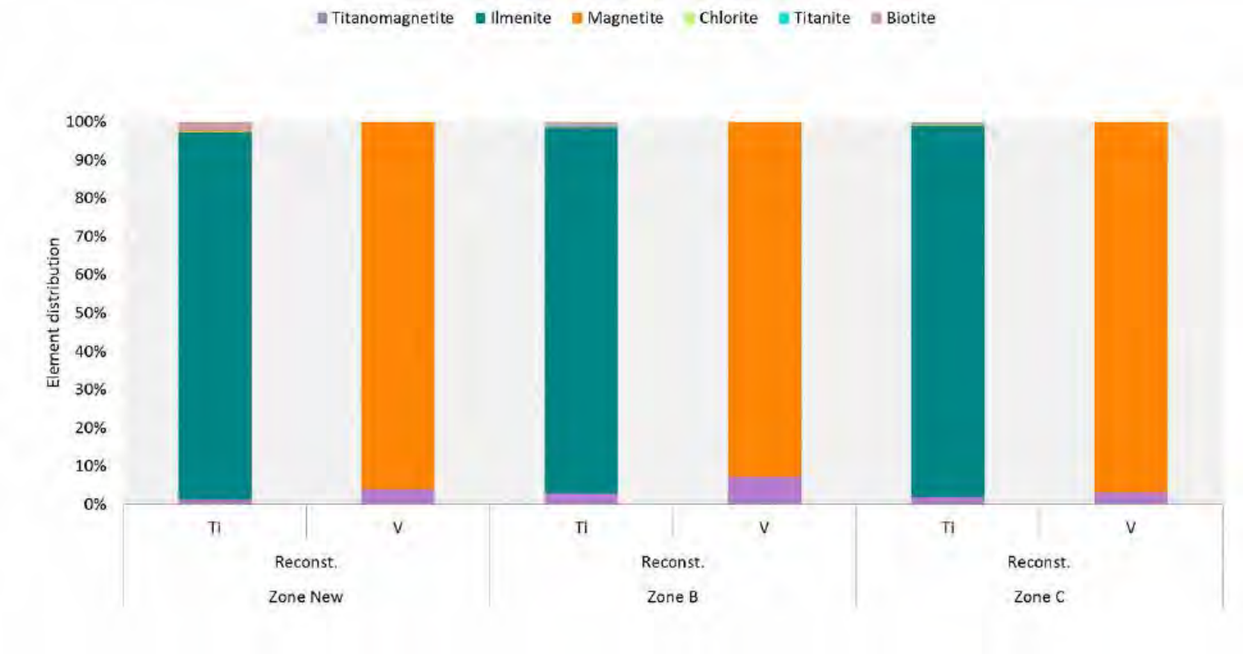


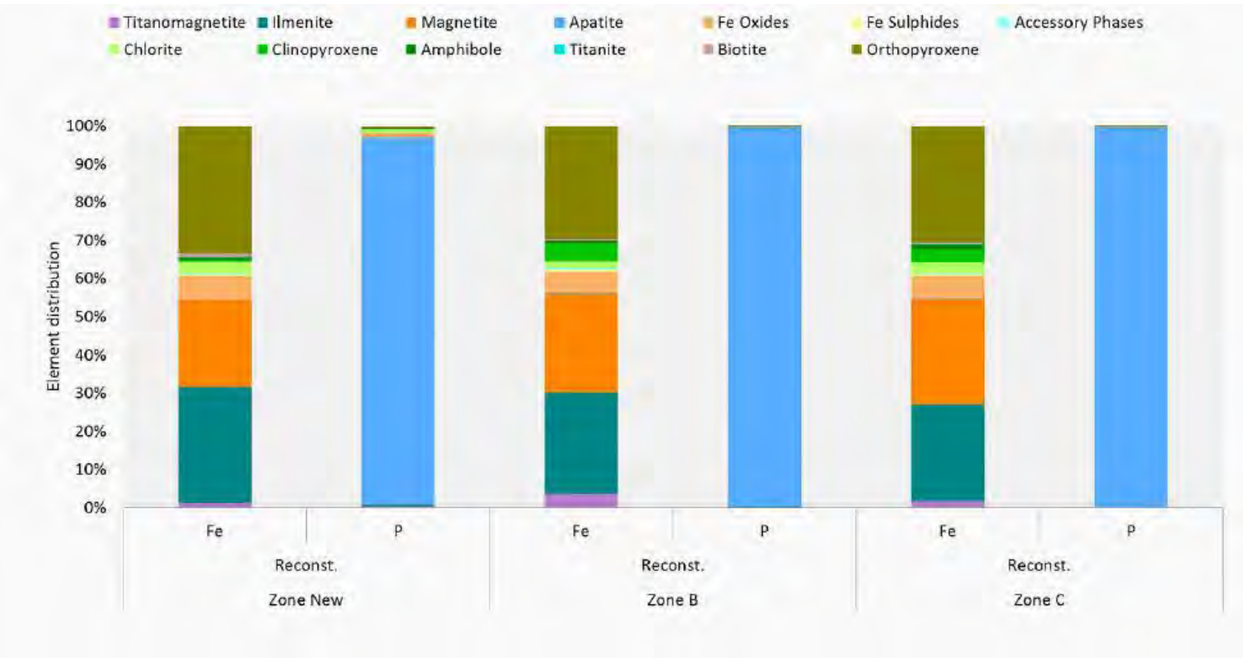
Figure 3: Deportment of Ti, V,Fe & P (% normalised)

1 Reconstructed grades for the automated analysis were based on the modal mineralogy except for Ti & V. These values were calculated from point-and-shoot analysis averages of magnetite, titanomagnetite and ilmenite for each zone. Ti & V values for biotite, chlorite and titanite were taken from EDX spectra during the automated runs.

Deportment of Ti & V



Deportment of Fe & P



Grain size

The grain size occurrence and distribution statistics for target minerals (ilmenite, magnetite, apatite, titanomagnetite along with overall mineral particles) are listed in following table.

The key features of these grain-size statistics are that ilmenite and magnetite are similar to each other in all samples except in Zone C where the magnetite is coarser. Apatite is finer-grained than ilmenite and magnetite. Titanomagnetite is much finer grained than remaining target minerals. The overall grain size distribution of target minerals is similar in each sample. Only magnetite shows small variations between different samples being coarsest grained in Zone C, followed by New Zone, and then Zone B.

Sample	Occurrence	Grain size (µm)			
		D20	D50	D80	D95
Mineral Particle					
Bjerkreim New Zone	1,935	469	1,000	1,555	2,022
Bjerkreim Zone B	2,029	257	832	1,504	1,992
Bjerkreim Zone C	1,952	288	930	1,549	2,142
Ilmenite					
Bjerkreim New Zone	1,180	206	413	679	890
Bjerkreim Zone B	1,500	146	301	564	1,010
Bjerkreim Zone C	844	196	403	741	1,143
Magnetite					
Bjerkreim New Zone	776	172	405	769	892
Bjerkreim Zone B	1,318	128	302	586	876
Bjerkreim Zone C	724	157	541	932	1,283
Apatite					
Bjerkreim New Zone	72	99	222	292	388
Bjerkreim Zone B	2,224	113	197	351	627
Bjerkreim Zone C	1,334	110	192	345	609
Titanomagnetite					
Bjerkreim New Zone	1,464	19	23	39	77
Bjerkreim Zone B	4,227	15	24	55	92
Bjerkreim Zone C	1,447	19	23	52	142
Notes: The approximate Dx values are given (e.g. D80 – this is the grain size at the 80% point in the grain size distribution of the phase by cumulative mineral mass i.e. 80% by mass is finer than the given diameter). For target minerals with low occurrence the Dx values may not be wholly representative.					

Liberation and association study

Mode of liberation

For ilmenite, overall liberation is moderate in the New Zone and Zone C and moderate to good in Zone B. Liberation levels vary for all samples. The New Zone also shows more than 60% locked ilmenite, while for samples Zone B and Zone C the amount of locked ilmenite is ~40%.

Magnetite shows moderate to poor liberation considering middlings. For all samples ~45% of magnetite is locked.

For apatite, liberation is good for all samples with ~40% liberated particles. For all samples there is a consistent proportion of 50 - 55% of the apatite that can be considered locked.

Considered by size fraction it's clear that liberation for ilmenite, apatite and magnetite all remarkedly improve into the finest two (+250 µm and -250 µm) size fractions.

For all samples titanomagnetite is entirely locked within the particles, across all size fractions. However, whilst titanomagnetite is universally locked, this is nearly always within magnetite as the primary host.

Figure 4: Mode of liberation of ilmenite for the Bjerkreim samples

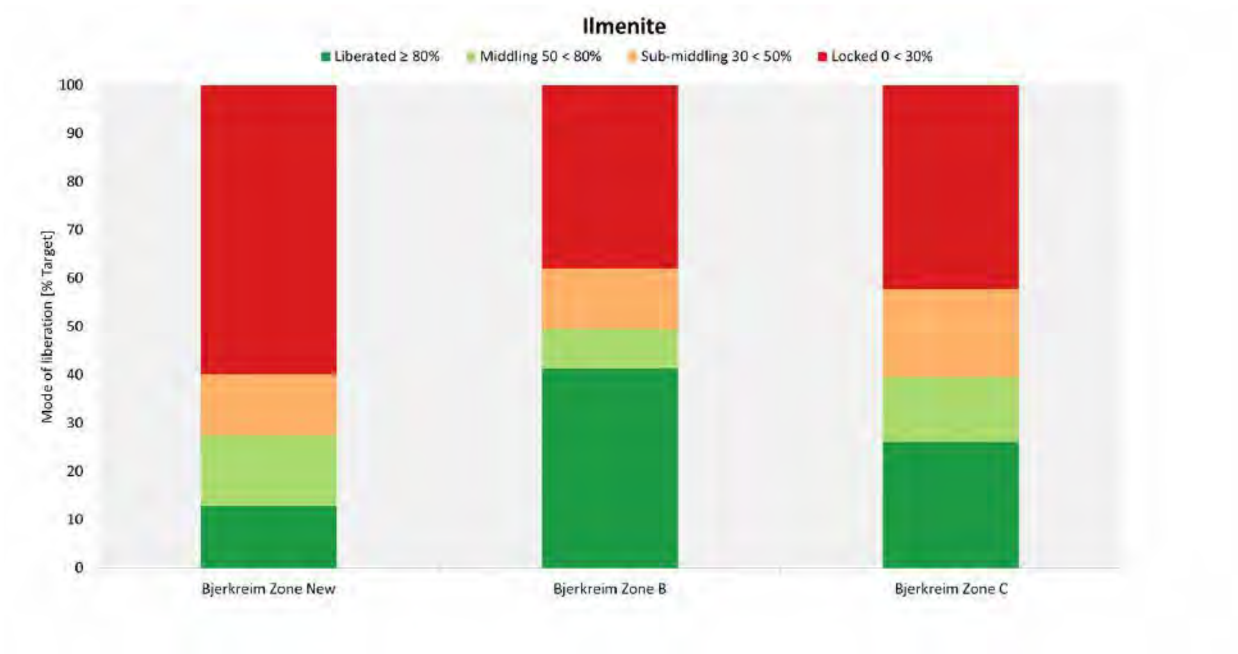


Figure 5: Mode of liberation of magnetite for the Bjerkreim samples

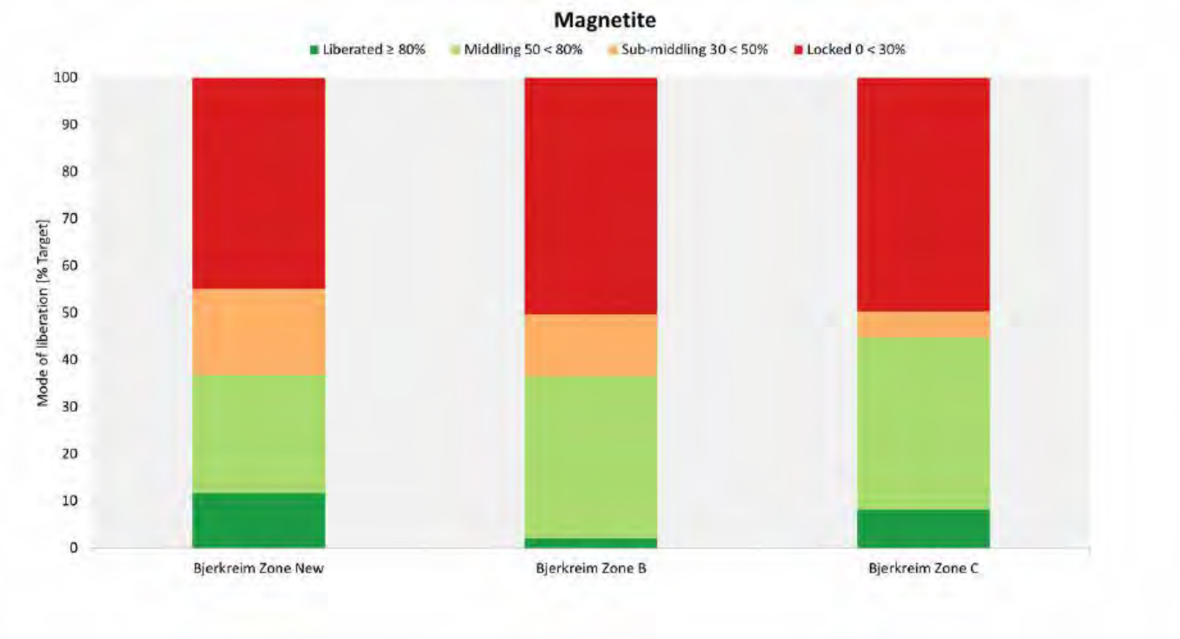


Figure 6: Mode of liberation of apatite for the Bjerkreim samples

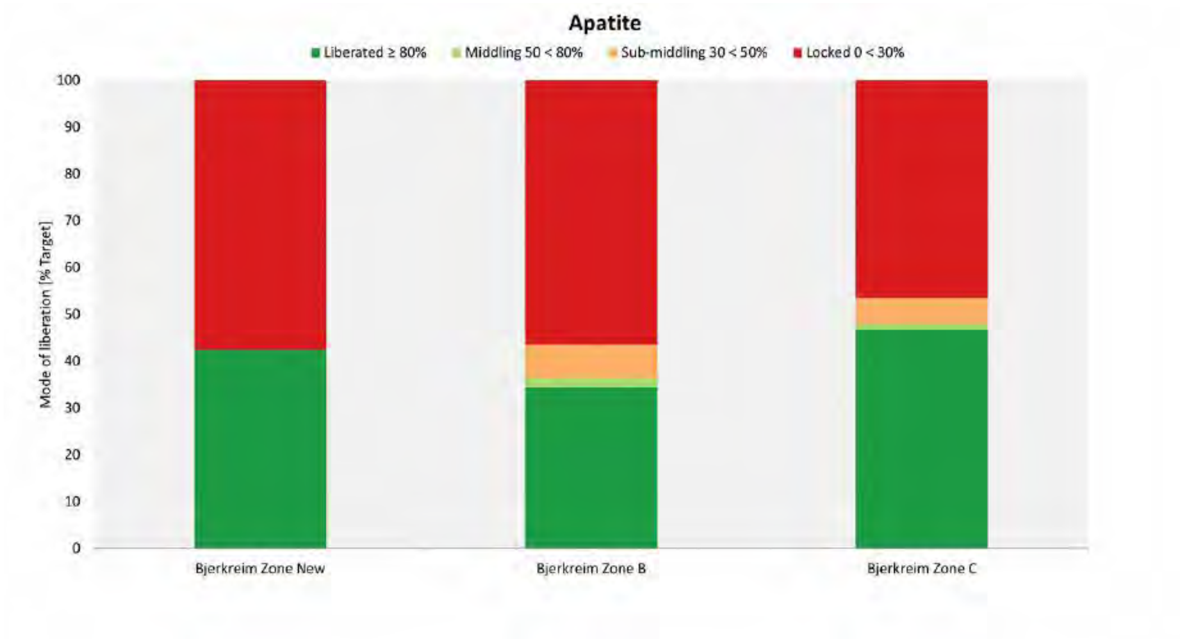
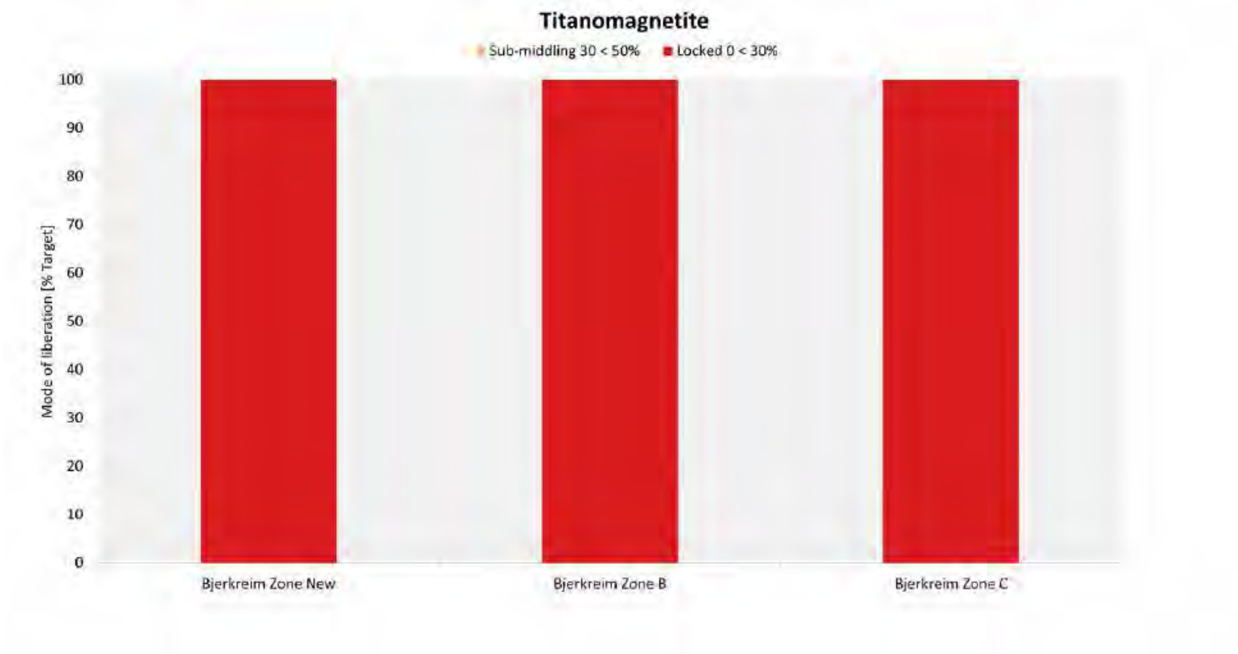


Figure 7: Mode of liberation of titanomagnetite for the Bjerkreim samples



Theoretical grade vs recovery

Theoretical grade-recovery curves for ilmenite (Figure 8) are moderate overall with some minor variations between samples.

Theoretical grade-recovery curves for magnetite (Figure 9) show moderate recovery with very similar theoretical recovery across all samples. This is consistent with the mode of liberation values for magnetite (Figure 5).

Apatite shows relatively good theoretical recovery, with slightly better recovery for New Zone and Zone C (Figure 10).

For all samples, ilmenite, magnetite and apatite in +250 µm and -250 µm size fractions show good theoretical recovery, which becomes moderate to poor for coarser size fractions.

For titanomagnetite the theoretical recovery is much lower and generally poor (Figure 11). This is visible in the mode of liberation charts, where titanomagnetite is almost entirely locked and is always in close association with magnetite.

Figure 8: Theoretical grade-recovery of ilmenite for the Bjerkreim samples

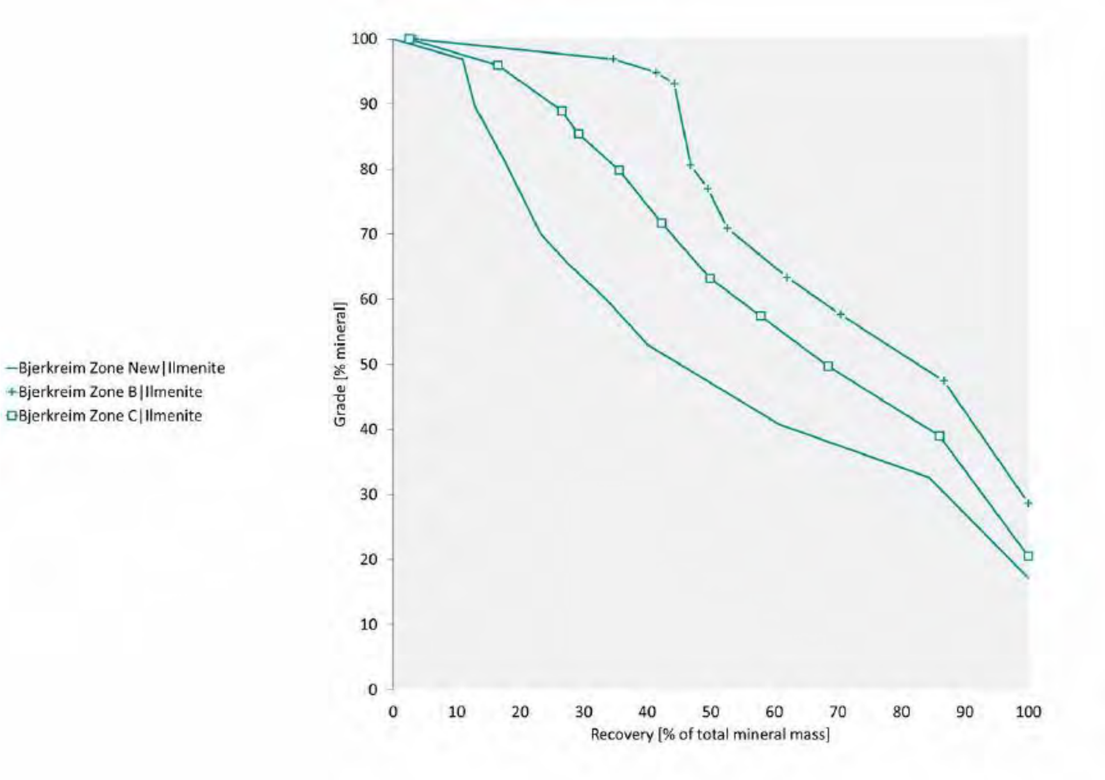


Figure 9: Theoretical grade-recovery of magnetite for the Bjerkreim samples

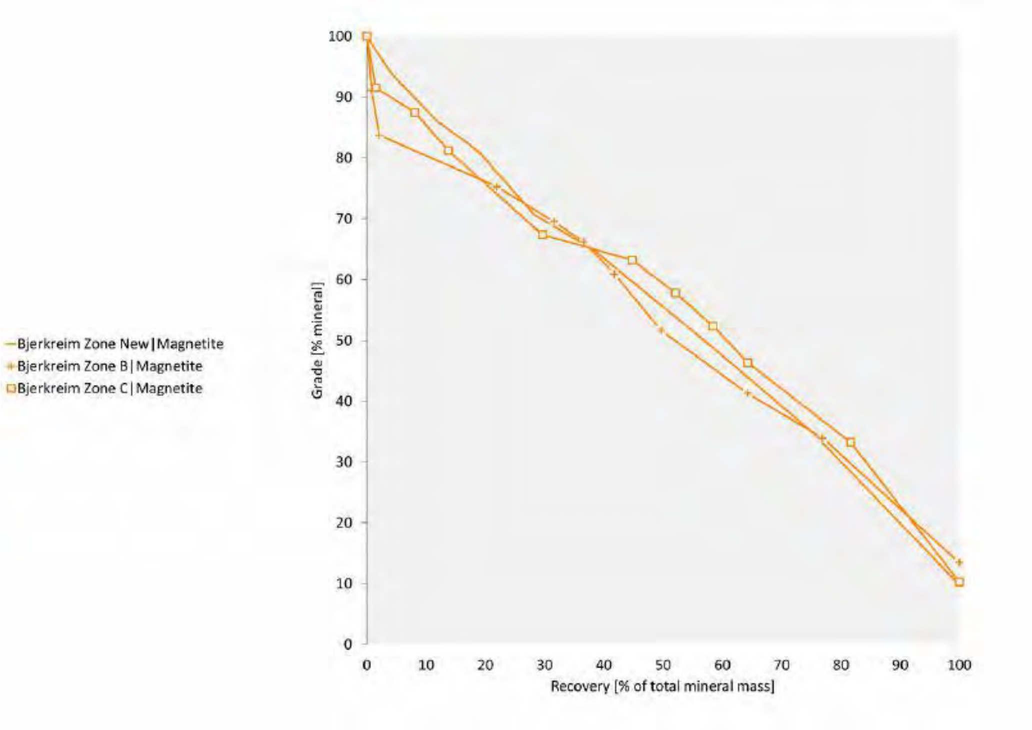


Figure 10: Theoretical grade-recovery of apatite for the Bjerkreim samples

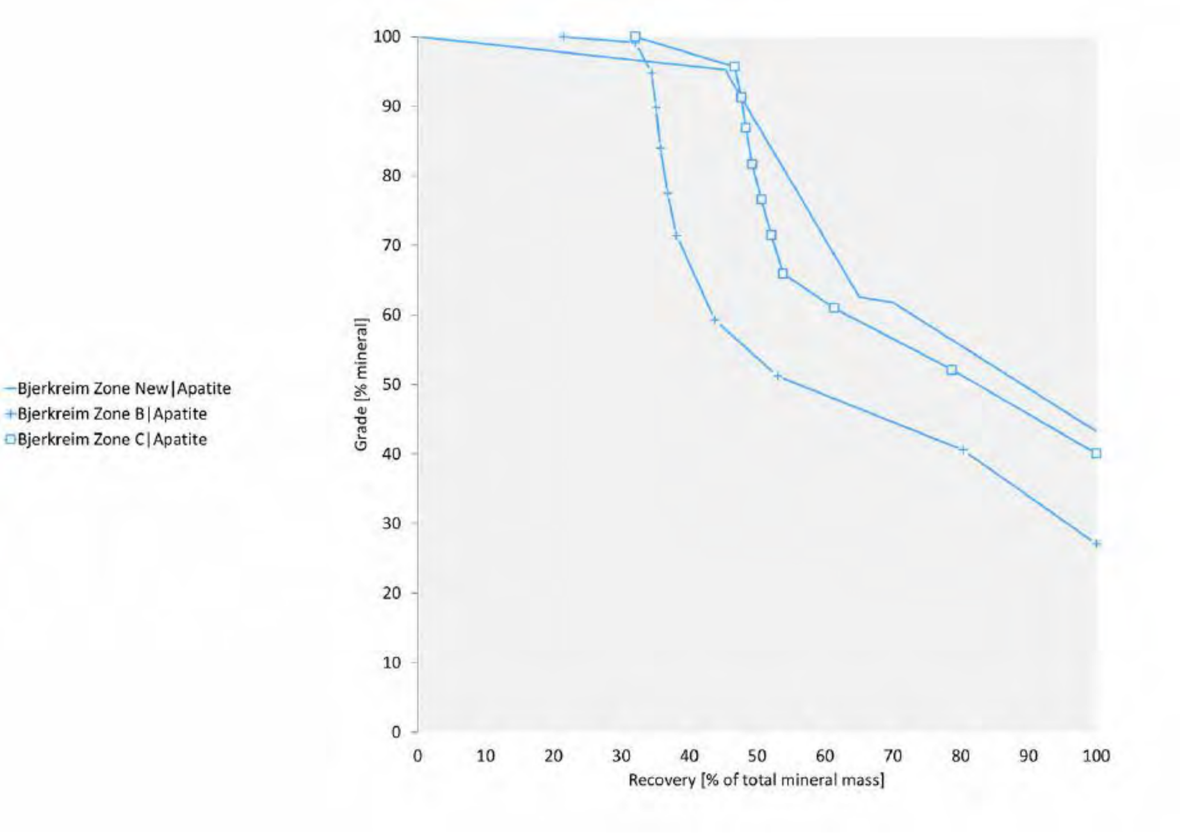
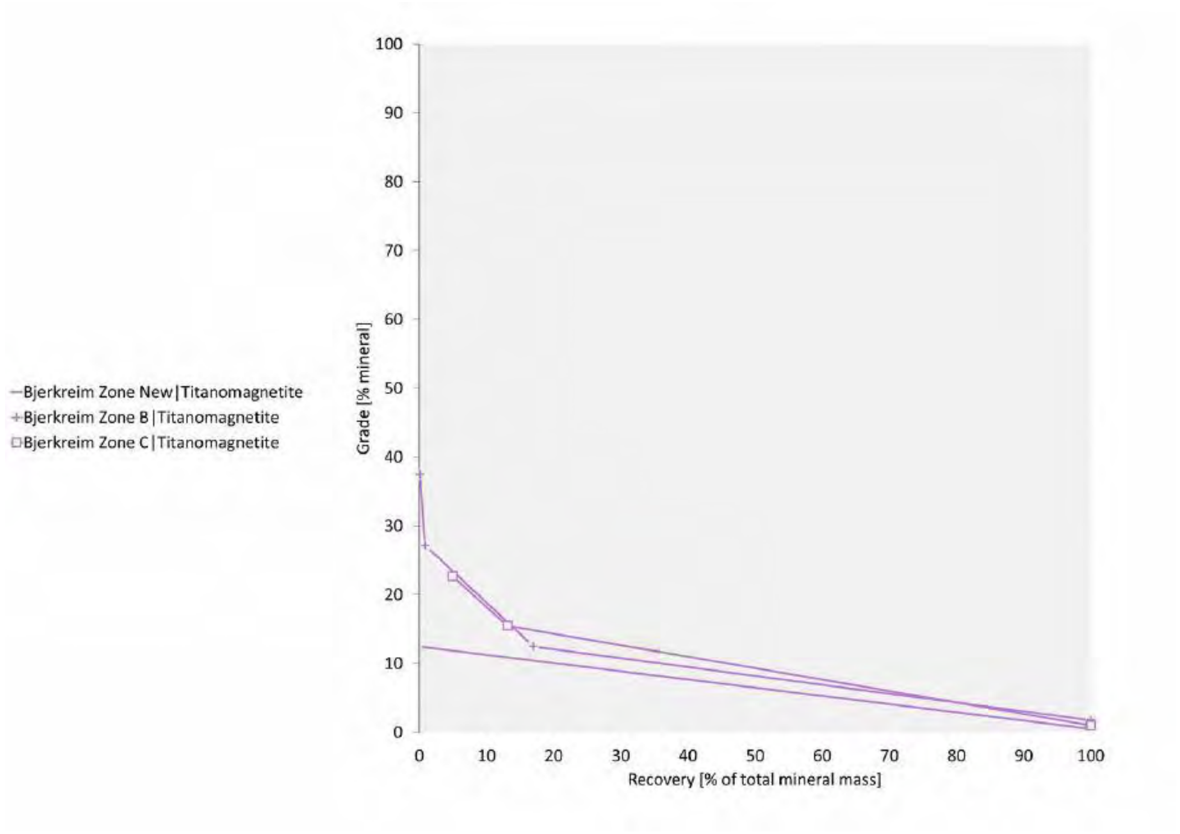


Figure 11: Theoretical grade-recovery of titanomagnetite for the Bjerkreim samples



Theoretical mineral recovery by particle size

The theoretical mineral-recovery data breaks down the mode of liberation by the overall mineral particle size class with an overlay of the cumulative mineral recovery. The mode of liberation by particle size class of ilmenite for all samples is moderate to good below 600 µm size class (Figure 12) with 55% to 85% in locked particles.

For magnetite the liberation is generally moderate to poor in the coarser particle size classes above 212 µm. These coarse particles contain ~85% to 95% of magnetite. In particle size classes below 212 µm the liberation does tend to improve.

Mineral recovery by particle size class of apatite for all samples is generally poor in the coarser particle size classes above 300 µm. These coarse particles contain 55% - 65% of apatite. In particle size classes finer than 300 µm the liberation does tend to improve becoming good to excellent.

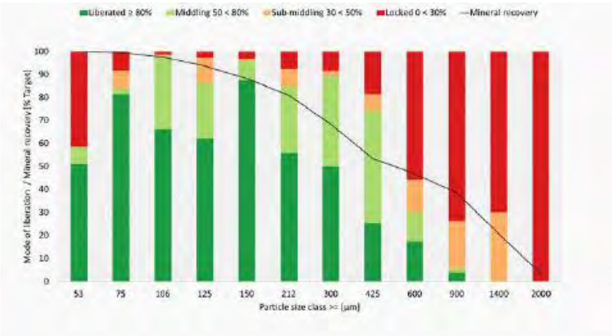
For titanomagnetite the liberation is poor for all samples and all particle size classes.

Figure 12: Theoretical mineral-recovery of ilmenite and magnetite for Bjerkreim New Zone

New Zone - ilmenite

New Zone - magnetite

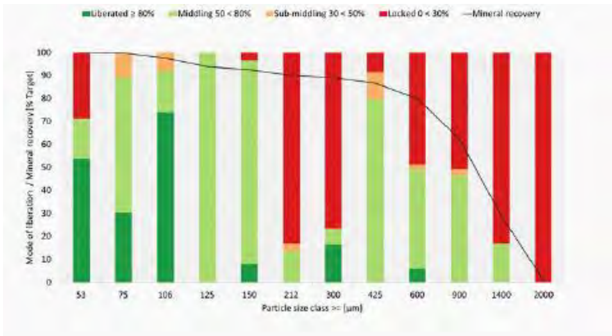
Zone B - ilmenite



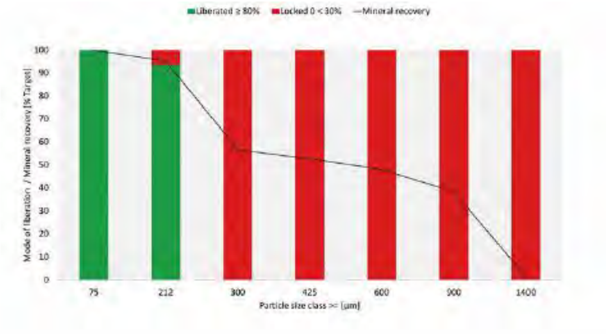
Zone B - magnetite

Zone C - ilmenite

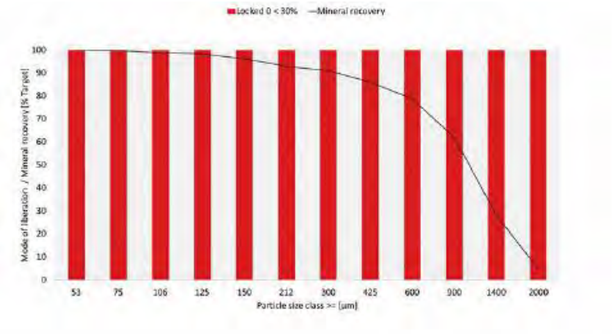
Zone C - magnetite



New Zone - apatite

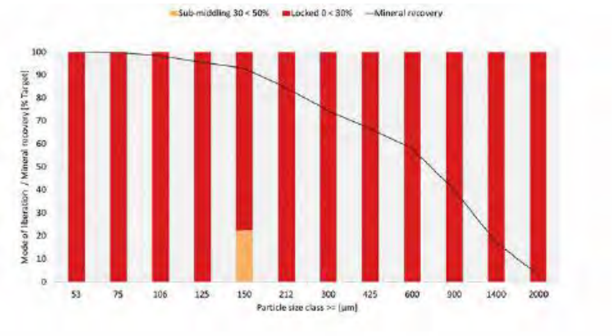


New Zone - titanomagnetite

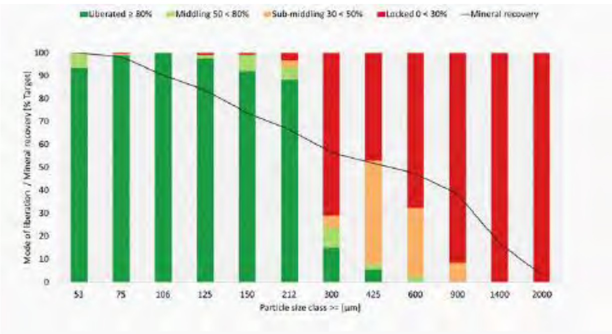


Zone B - apatite

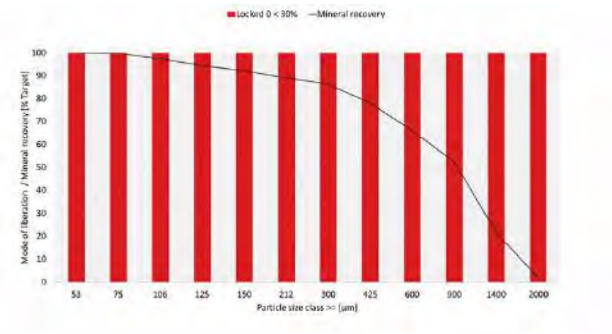
Zone B - titanomagnetite



Zone C - apatite



Zone C - titanomagnetite



Particle association

The major mineral associates for ilmenite are titanomagnetite, chlorite, clinopyroxene, plagioclase, orthopyroxene, magnetite and Fe oxides, along with a host of other common associations (Figure 13). The pattern is consistent for all samples, except for Zone B and Zone C, where the other common mineral associate is apatite.

For magnetite the major mineral associates are Fe oxides, titanomagnetite, chlorite, biotite, ilmenite, along with a host of other common associations (Figure 14).

The major mineral associates for apatite are chlorite, clinopyroxene, amphibole, ilmenite, magnetite, Fe oxides, along with a host of other common associations (Figure 15).

For titanomagnetite the major mineral associates are ilmenite, magnetite, chlorite, Fe oxides, accessory phases, along with a host of other common associations (Figure 16).

Figure 13: Major mineral association for ilmenite for all samples

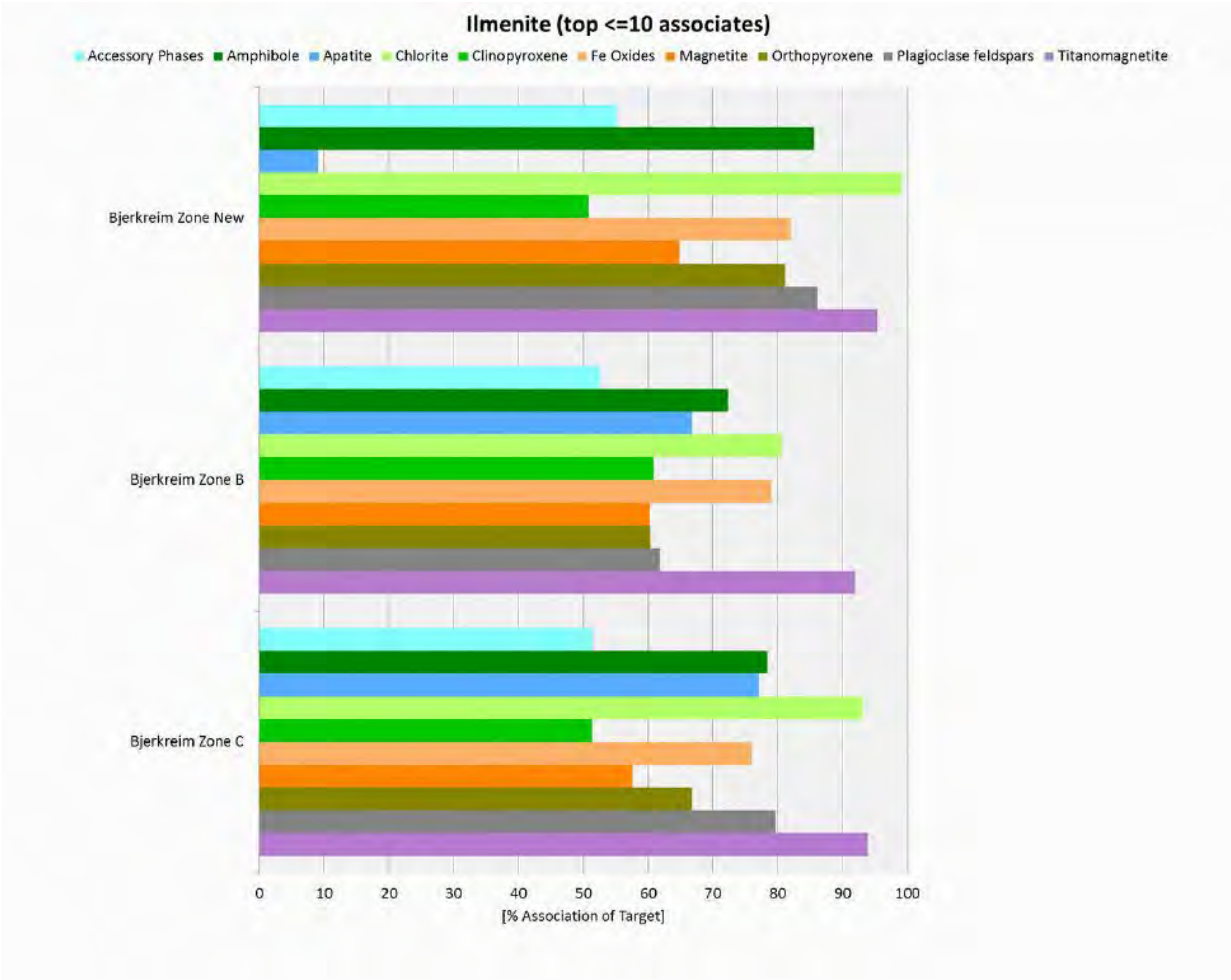


Figure 14: Major mineral association for magnetite for all samples

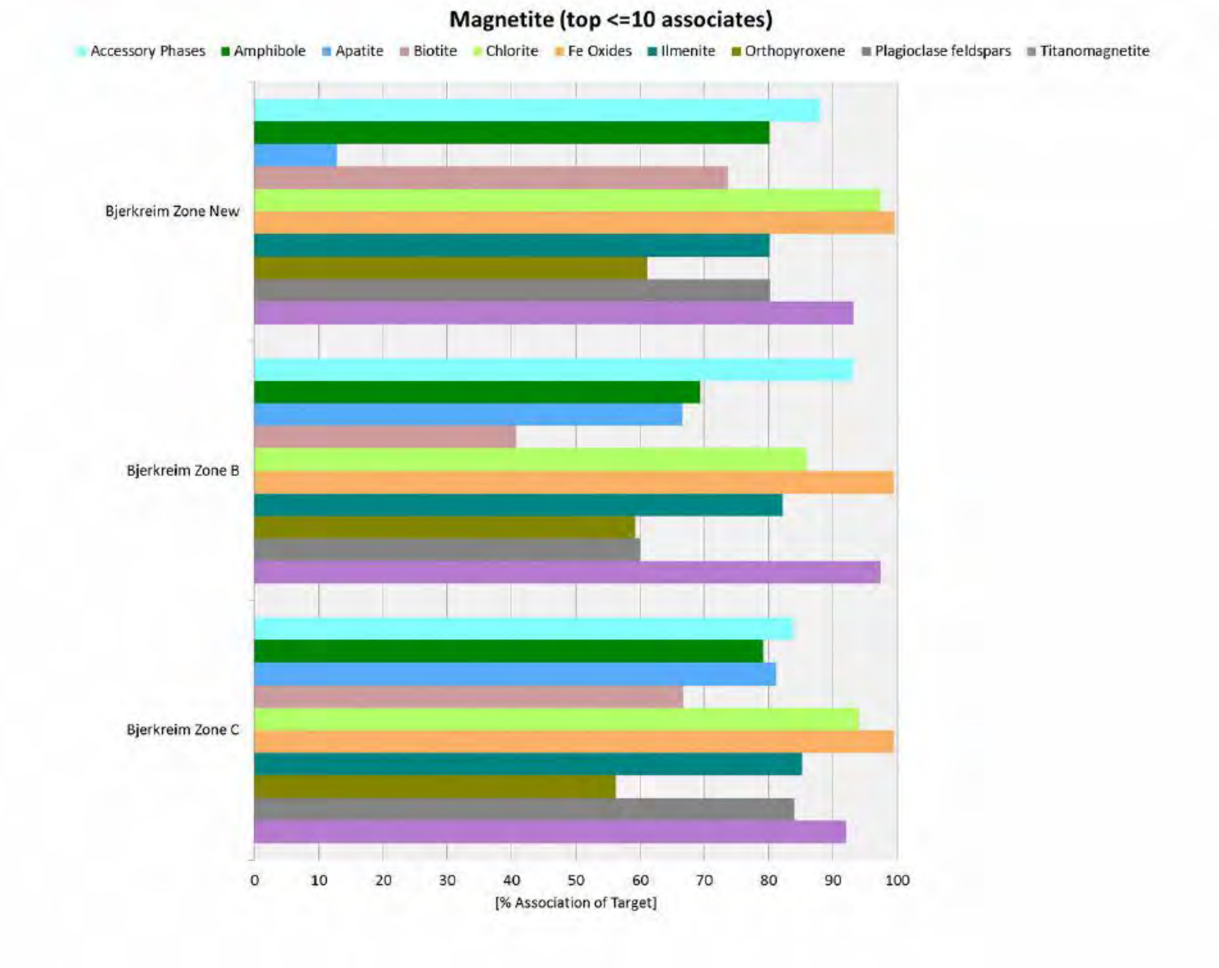


Figure 15: Major mineral association for apatite for all samples

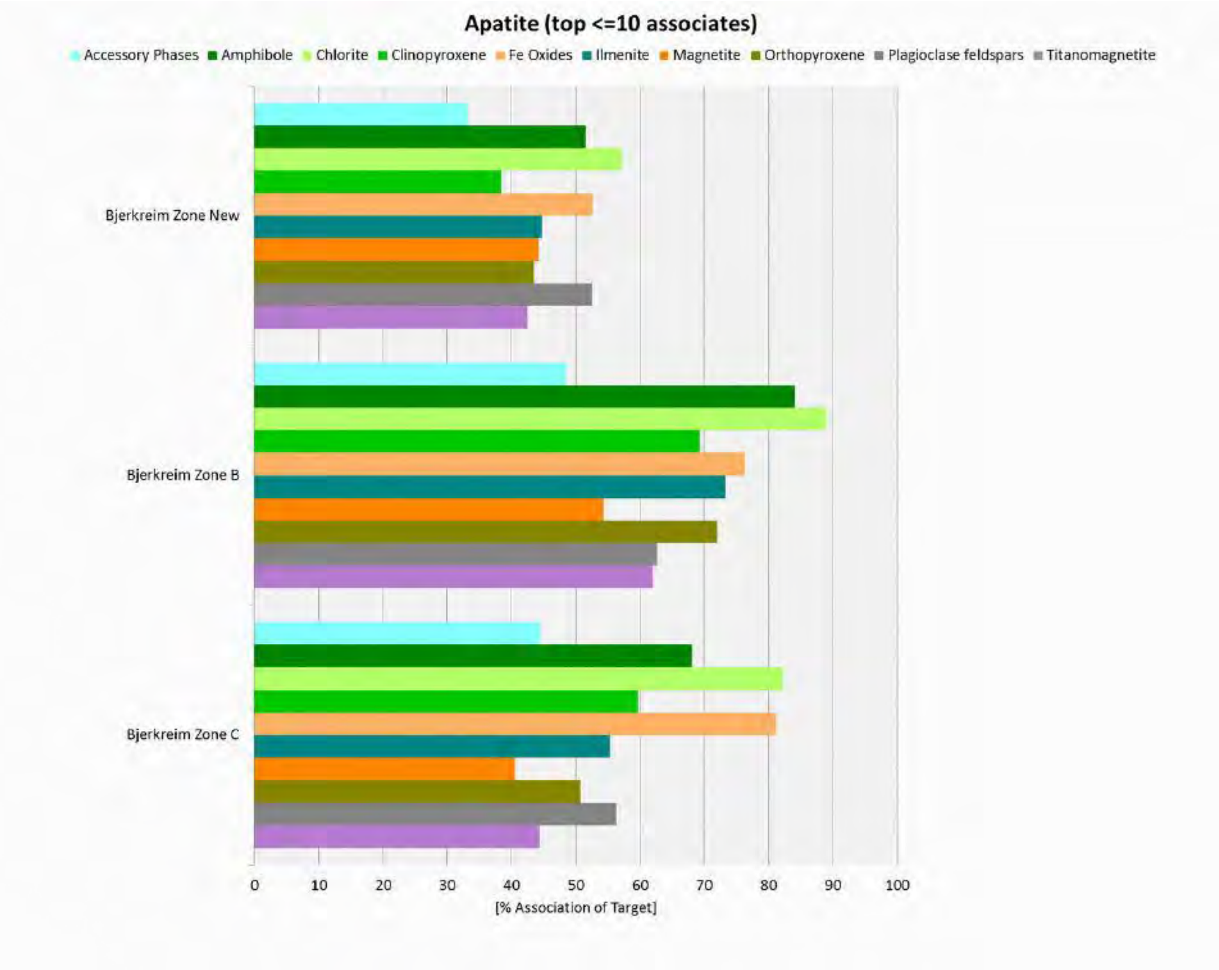
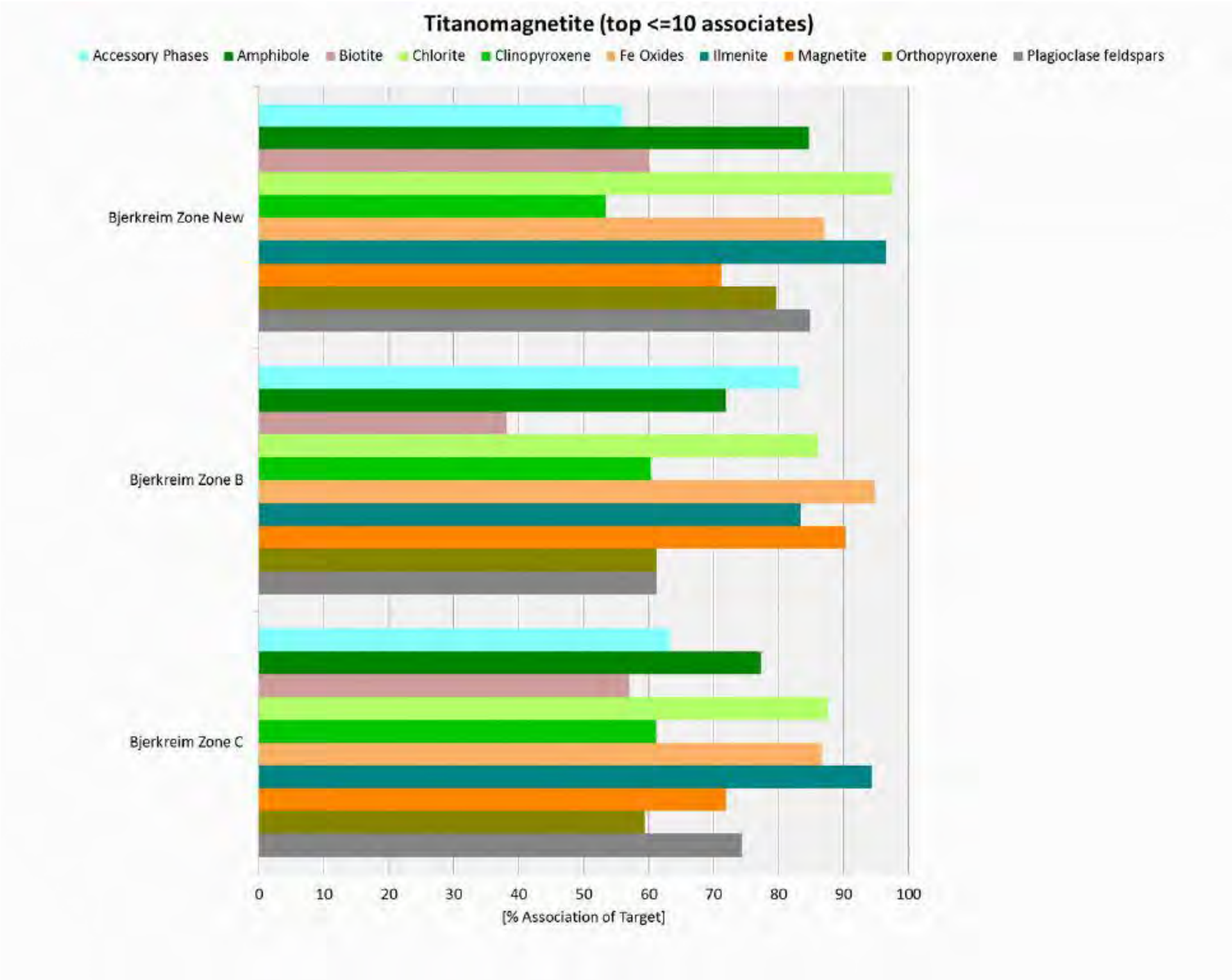


Figure 16: Major mineral association for titanomagnetite for all samples



Theoretical mineral recovery by particle SG

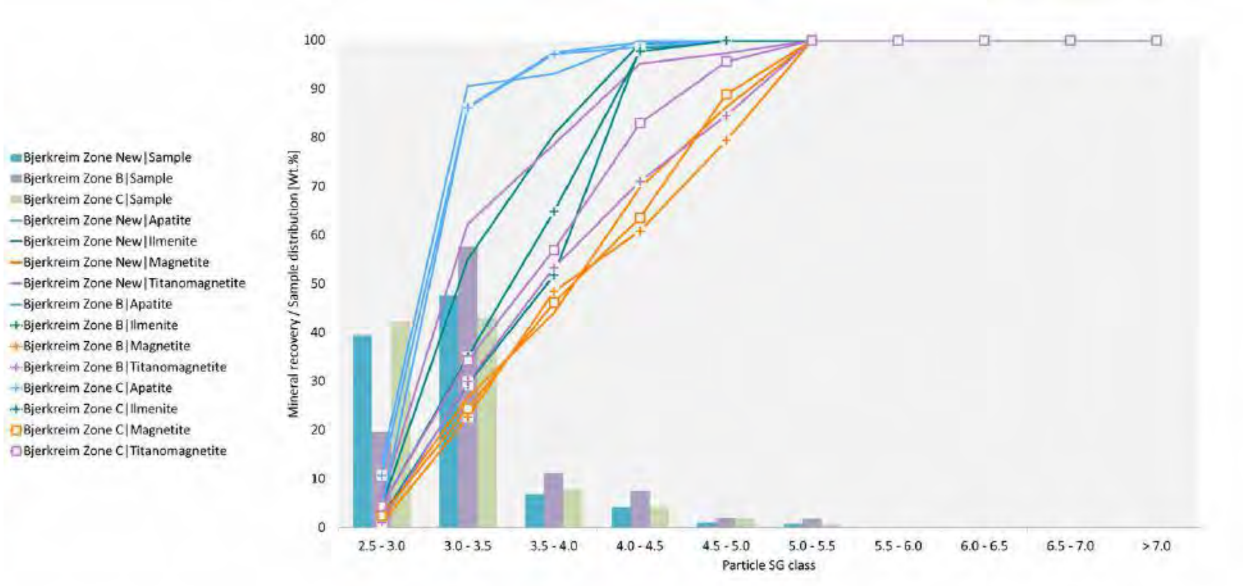
The main observations of the theoretical mineral recovery by particle specific gravity (SG) is the good potential for gravity separation of less dense (gangue - dominant particles) and more dense (magnetite dominant) particles. The sample mass distribution (Figure 17 - bars) show that most of the sample gangue minerals have density up to 3.5 kg/m^3.

At the current grind size, as analysed, a theoretical cut @ SG of 3.5 kg/m^3 would remove a sample mass to the floats of ~87% - Zone New, 77% - Zone B and 85% - Zone C. The floats would also recover a significant proportion of the apatite (91% - Zone New and 86% - Zone B & C). The theoretical sinks recoveries are shown in the table below;

Mineral recovery Sinks 3.5	Zone New	Zone B	Zone C
Magnetite	73%	77%	76%
Ilmenite	45%	71%	65%
Titanomagnetite	38%	70%	65%

However, if the results for individual fractions are considered, it can be seen that by the +250 µm fraction the predicted recovery of magnetite to a 3.5 kg/m^3 sink improves to >95% in Zone New and Zone B and 88% in Zone C. This coupled with the D50 and D80 size data for magnetite and ilmenite would suggest targeting grind testwork in the range of 400 µm and 600 µm in order to to optimise the balance between recovery and grade and also limit the potential for sliming of the target minerals.

Figure 17: Theoretical mineral-recovery by particle SG for the Bjerkreim samples



[Wt.%]	Bjerkreim Zone New					Bjerkreim Zone B					Bjerkreim Zone C				
	Apatite	Ilmenite	Magnetite	Titanomagnetite	Sample	Apatite	Ilmenite	Magnetite	Titanomagnetite	Sample	Apatite	Ilmenite	Magnetite	Titanomagnetite	Sample
2.5 - 3.0	13.1	4.3	2.6	6.1	39.4	4.0	2.1	0.9	1.1	19.7	10.7	4.4	2.4	4.4	42.1
3.0 - 3.5	90.6	55.1	26.7	62.3	87.1	86.3	29.4	22.7	29.9	77.4	86.1	35.1	24.5	34.3	85.3
3.5 - 4.0	93.1	80.6	44.0	78.6	94.0	97.5	51.8	48.4	53.3	88.5	97.1	64.9	46.2	57.0	93.2
4.0 - 4.5	100.0	99.3	69.8	95.2	98.2	99.5	98.3	60.8	71.1	96.2	98.6	97.7	63.6	83.0	97.4
4.5 - 5.0	100.0	99.9	86.3	97.3	99.3	99.9	99.9	79.4	84.5	98.2	100.0	100.0	88.9	95.6	99.3
5.0 - 5.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
5.5 - 6.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
6.0 - 6.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
6.5 - 7.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
> 7.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Scanning electron microscopy analysis

Magnetite, titanomagnetite and ilmenite grains from all three samples were located and analysed by EDX with a total of 60 points. Histograms of the vanadium and titanium values are shown in Figures 18 and 19.

The vanadium values show consistency across individual magnetite grains with average of 0.59 %V and a range from 0.0 to 0.68 %V. Two grains of titanomagnetite were found in the Zone B sample with the vanadium values range from 0.0 to 0.52 %V. Spot analysis on ulvospinel present in the Zone B sample as an exsolution texture shows the average of 0.21 %V and a range from 0.17 to 0.27 %V.

For titanium the average value for magnetite was 0.64 %Ti, with a range from 0.01 %Ti to 2.43 %Ti. The average titanium value for ilmenite was 29.25 %Ti, with a range from 28.21 %Ti to 30.47 %Ti.

Figure 18: Histogram of vanadium values for magnetite for the Bjerkreim samples

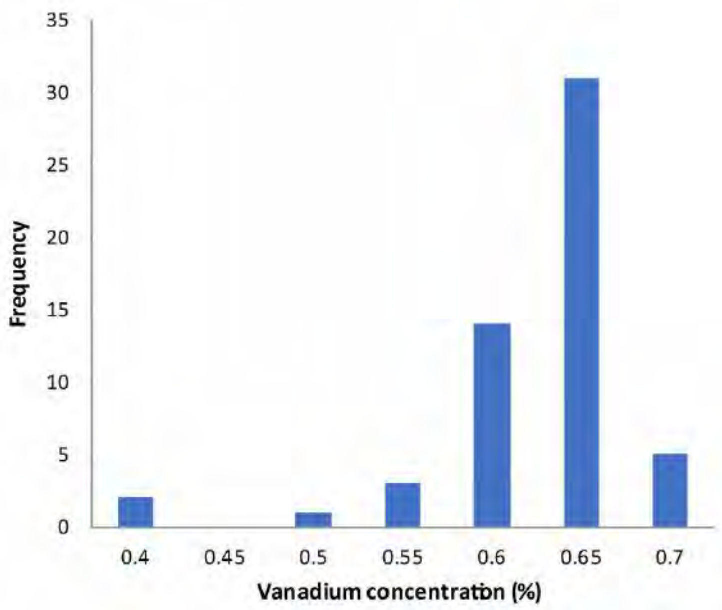


Figure 19: Histogram of titanium values for magnetite for the Bjerkreim samples

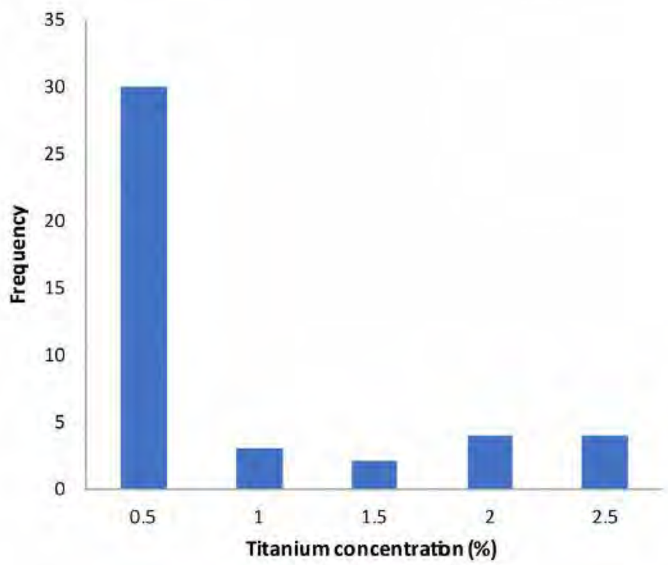


Figure 20: SEM analysis points for Bjerkreim New Zone

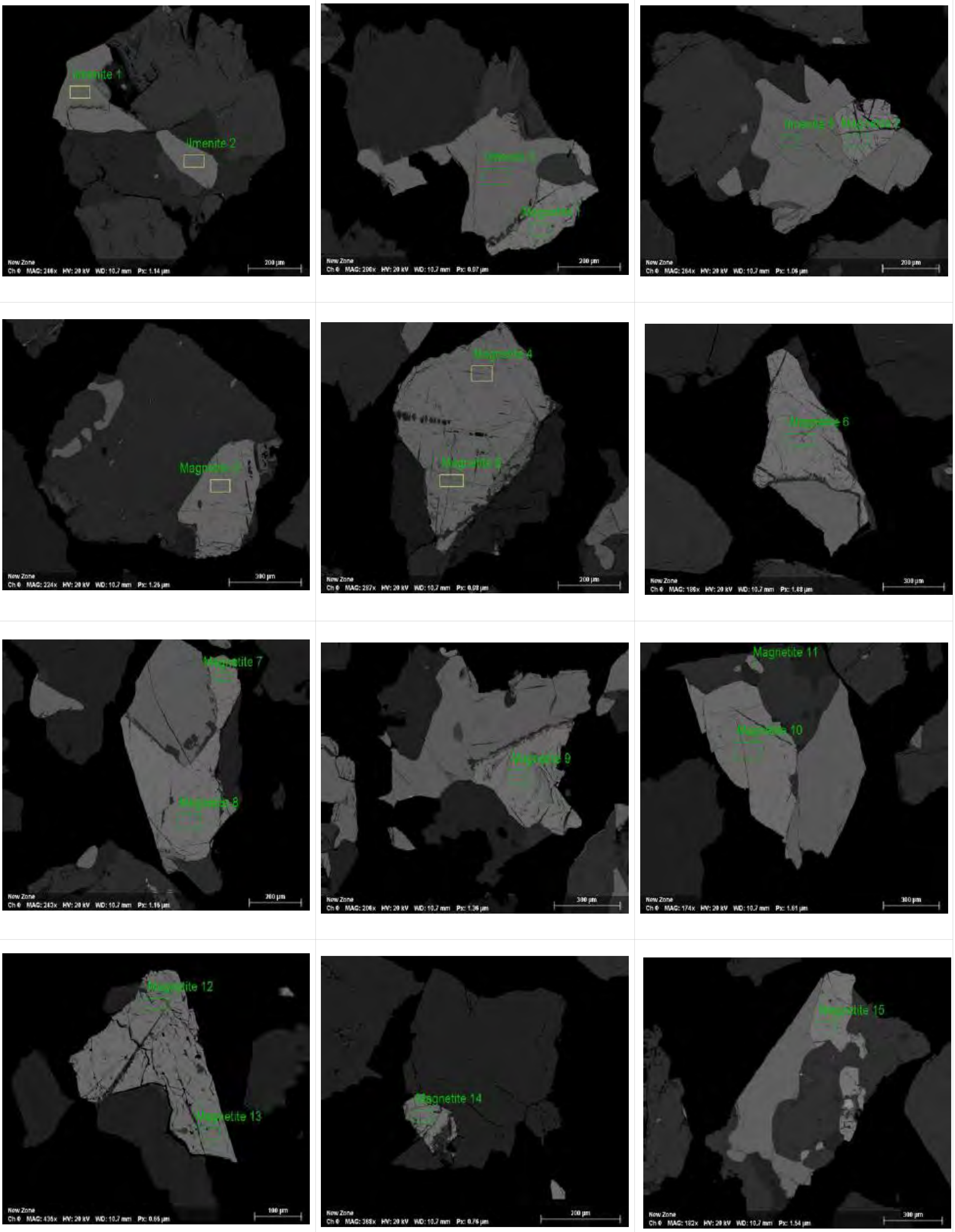


Figure 21: SEM analysis points for Bjerkreim Zone B

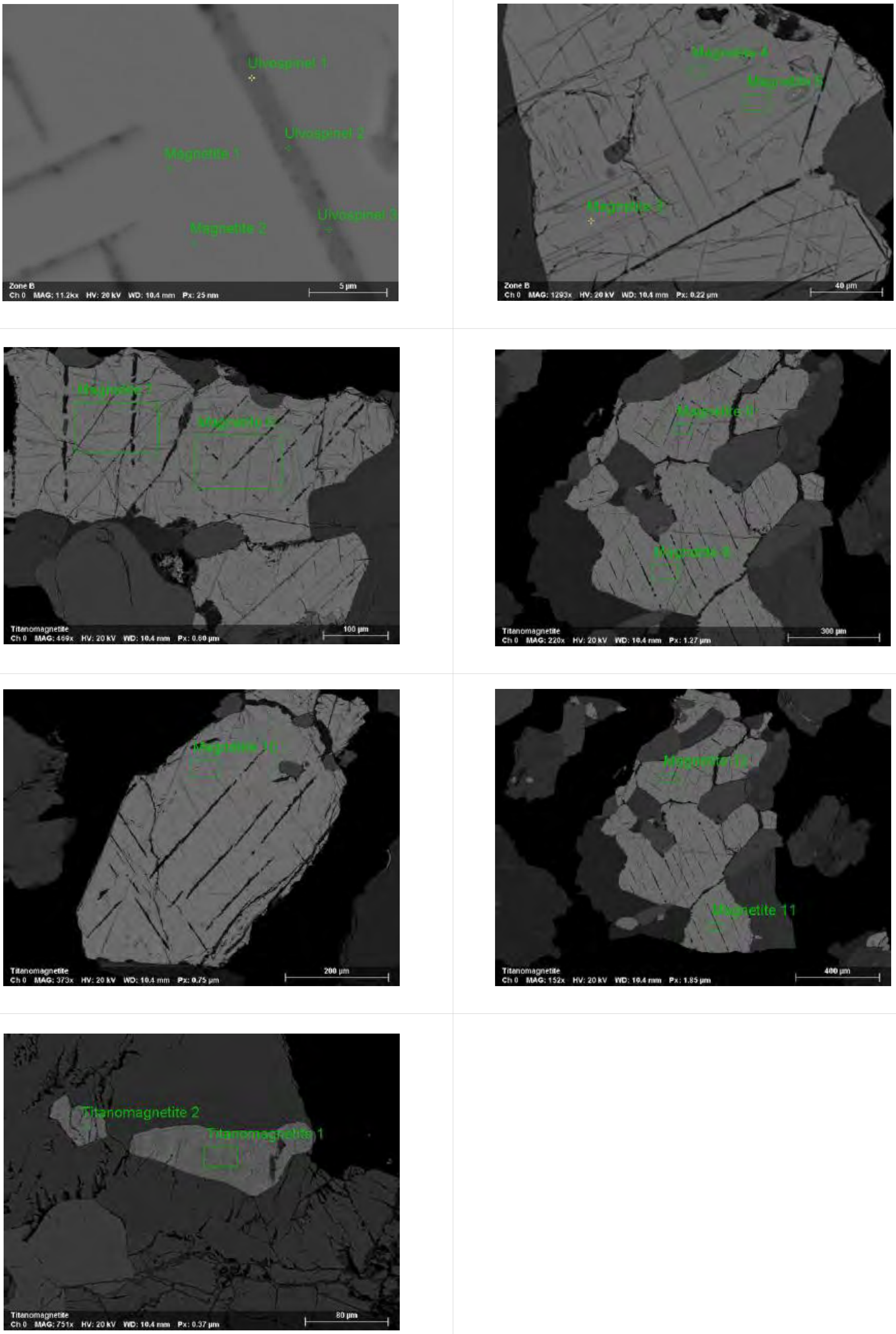
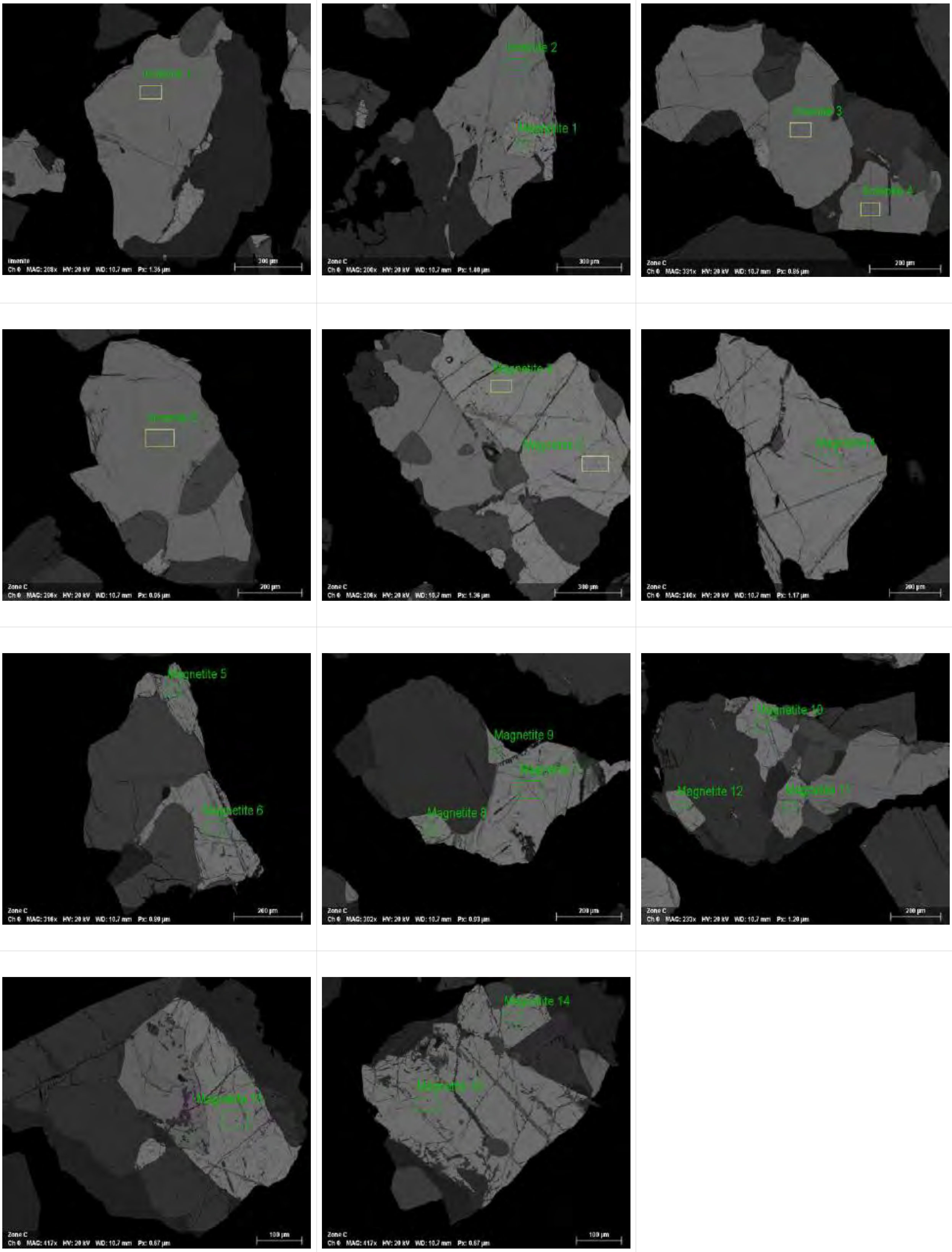


Figure 22: SEM analysis points for Bjerkreim Zone C



Conclusions

Three samples were supplied by Wardell Armstrong International Ltd for detailed mineralogical investigation. They were reported to be norite and gabbronorite samples with concentrations of magnetite, ilmenite and apatite.

1. The mineralogy has shown that the predominant ore mineral is magnetite which contains Fe and trace Ti and V in solid solution. Magnetite also shows titanomagnetite and ulvospinel exolutions within its grains. Ilmenite is the main source of Ti, with minor Fe and no V present within the ore matrix. Apatite is the only source of P in all samples. Titanite is also present within the ore but represents only 0.1% of the mineral mass. Titanomagnetite and ulvospinel also contain trace amounts of V (0.26 %V and 0.21 %V respectively).
2. The SEM analysis indicates that the average Ti content in ilmenite is ~29.25 %Ti with no associated V content. Magnetite contains ~0.64 %Ti and ~0.59 %V. The Fe contents are ~75 %Fe for magnetite, ~41 %Fe for ilmenite, ~58 %Fe for titanomagnetite and ~49 %Fe for ulvospinel.
3. In terms of relative deportment, >95% of the V is hosted by magnetite and >95% of the Ti is hosted by ilmenite.
4. In terms of grain size distribution, ilmenite and magnetite are similar to each other in all samples except in Zone C where the magnetite is coarser. Apatite has the same grain size in all samples and is finer-grained than ilmenite and magnetite. Titanomagnetite is much finer grained than the other target minerals.
5. Liberation for ilmenite, apatite and magnetite improves markedly in the finer +250 μm and -250 μm size fractions.
6. The calculation of theoretical mineral recovery by particle specific gravity (SG) shows the good potential for gravity separation of less dense (gangue - dominant particles) and more dense (magnetite dominant) particles. The gravity separation further improves by the +250 μm fraction, where predicted recovery of magnetite to a 3.5 kg/m^3 sink would be >95% in Zone New and Zone B and 88% in Zone C. This coupled with the D50 and D80 size data for magnetite and ilmenite would suggest targeting grind testwork in the range of 400 μm and 600 μm in order to optimise the balance between recovery and grade and also limit the potential for sliming of the target minerals.

<MAIN REPORT ENDS>

Appendix 1 | Automated mineralogy sample analytical details

Figure 1: Sample analysis details for all samples / size fractions

Analysis ID	Db File Name	Mining Sample	Mining Fraction	Analysis Name	Date Of Analysis	Magnification	Field Count	Particle Count	Min Particle Feret	Max Particle Feret
23	E:\Mineralogic Results\AM3398 BJERKREIM.db	Bjerkreim New Zone	+1mm	23um map	2019-10-21 16:56:59	48	12	203	23	2602
27	E:\Mineralogic Results\AM3398 BJERKREIM.db	Bjerkreim Zone B	+1mm	23um map	2019-10-21 19:10:55	48	13	207	23	2926
31	E:\Mineralogic Results\AM3398 BJERKREIM.db	Bjerkreim Zone C	+1mm	23um map	2019-10-21 21:40:16	48	12	211	23	2380
32	E:\Mineralogic Results\AM3398 BJERKREIM.db	Bjerkreim New Zone	+500um	20um map	2019-10-17 20:40:04	55	13	531	20	2004
24	E:\Mineralogic Results\AM3398 BJERKREIM.db	Bjerkreim Zone B	+500um	20um map	2019-10-17 15:47:08	55	12	515	20	1863
28	E:\Mineralogic Results\AM3398 BJERKREIM.db	Bjerkreim Zone C	+500um	20um map	2019-10-17 18:15:14	55	12	508	20	1581
33	E:\Mineralogic Results\AM3398 BJERKREIM.db	Bjerkreim New Zone	+250um	10um map	2019-10-15 00:43:39	55	12	558	10	852
25	E:\Mineralogic Results\AM3398 BJERKREIM.db	Bjerkreim Zone B	+250um	10um map	2019-10-14 19:08:40	55	13	651	10	796
29	E:\Mineralogic Results\AM3398 BJERKREIM.db	Bjerkreim Zone C	+250um	10um map	2019-10-14 13:37:33	55	13	581	10	766
34	E:\Mineralogic Results\AM3398 BJERKREIM.db	Bjerkreim New Zone	-250um	5um map	2019-10-11 19:28:20	111	32	641	5	340
26	E:\Mineralogic Results\AM3398 BJERKREIM.db	Bjerkreim Zone B	-250um	5um map	2019-10-11 14:11:03	111	38	656	5	437
30	E:\Mineralogic Results\AM3398 BJERKREIM.db	Bjerkreim Zone C	-250um	5um map	2019-10-11 12:54:01	111	27	652	5	380

Appendix 2 | Particle maps

Bjerkreim New Zone

Figure 23: Selected example field BSE and particle map images for the Bjerkreim New Zone sample + 1mm size fraction

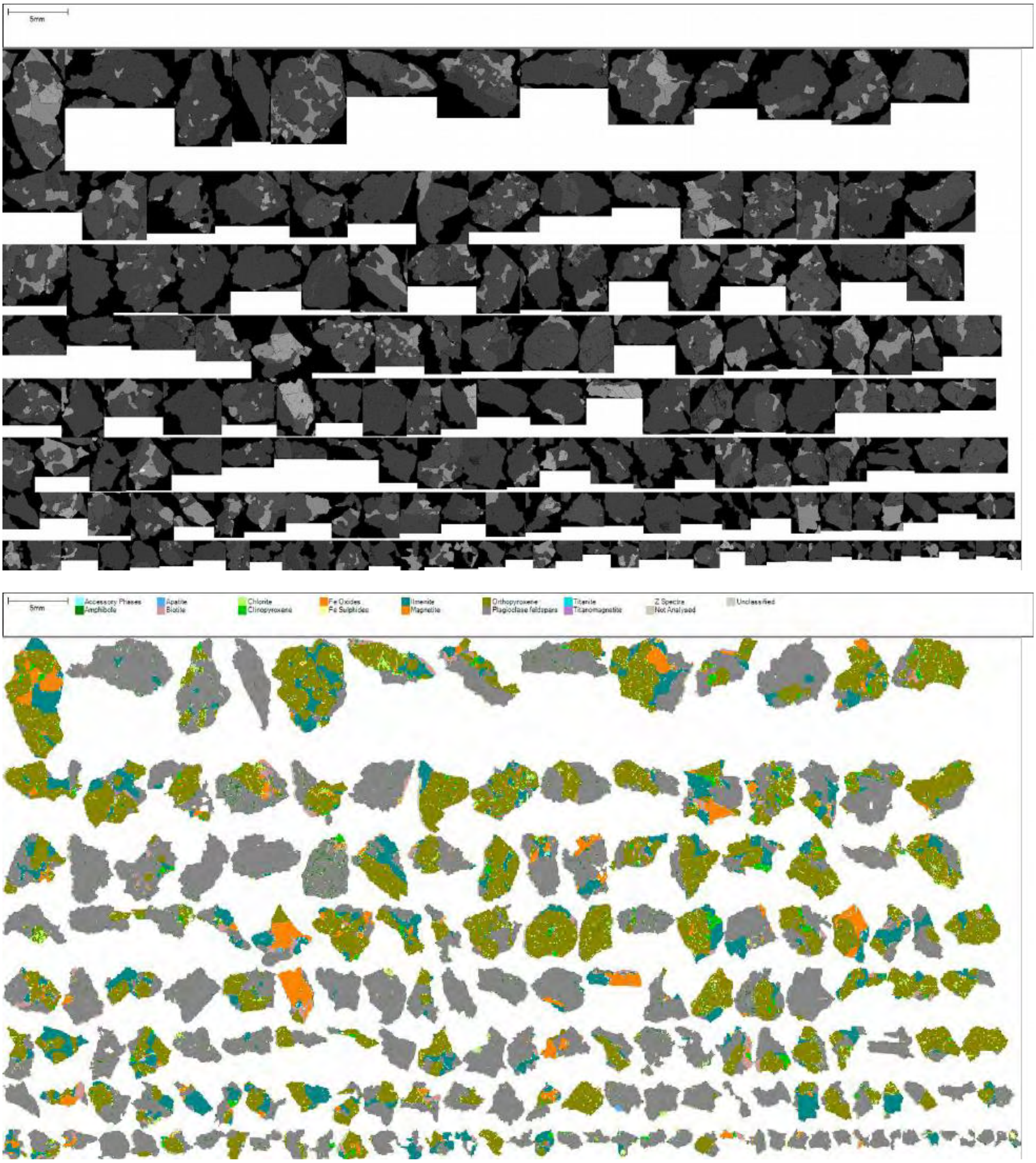


Figure 24: Selected example field BSE and particle map images for the Bjerkreim New Zone sample + 500 µm size fraction

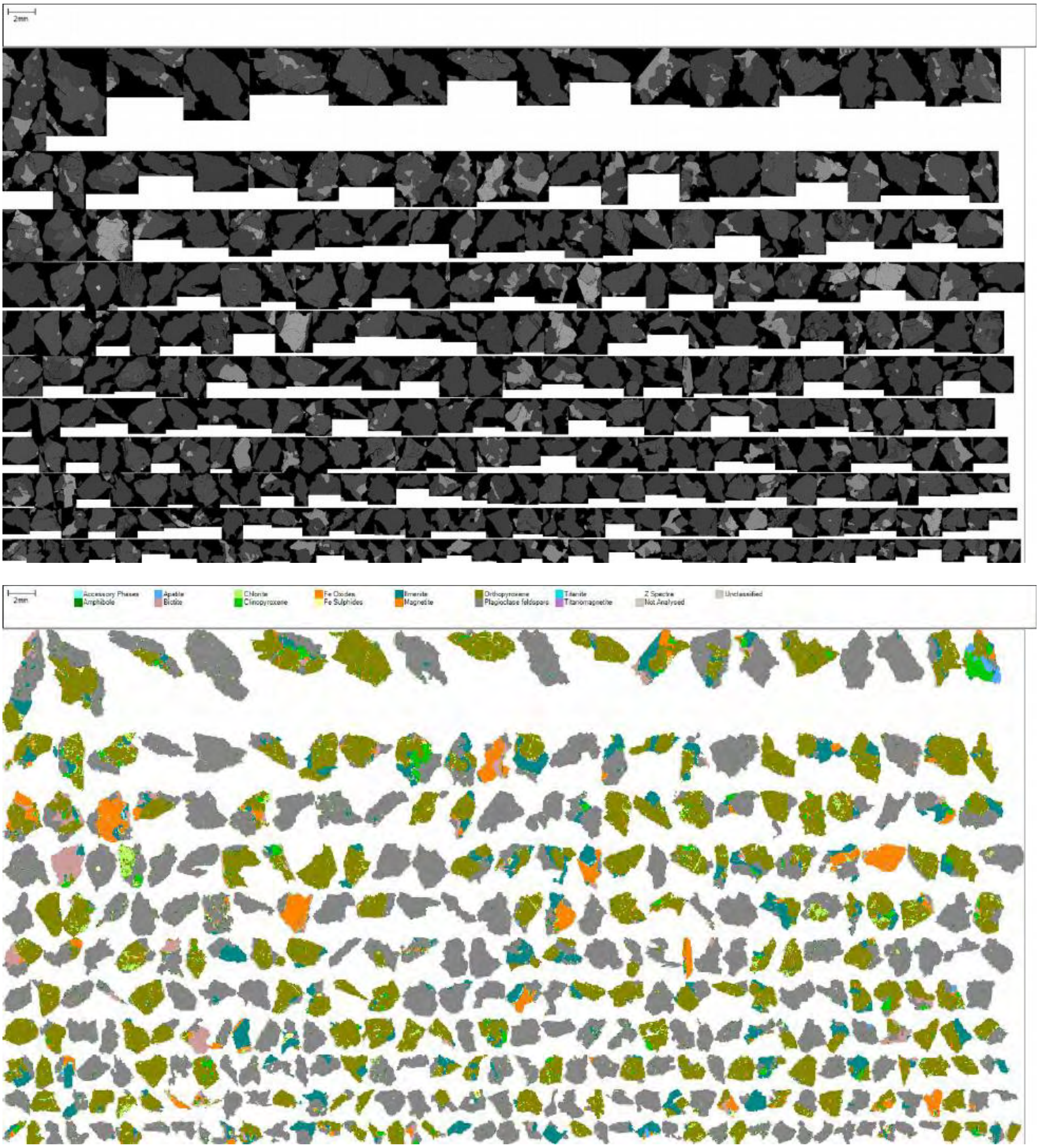
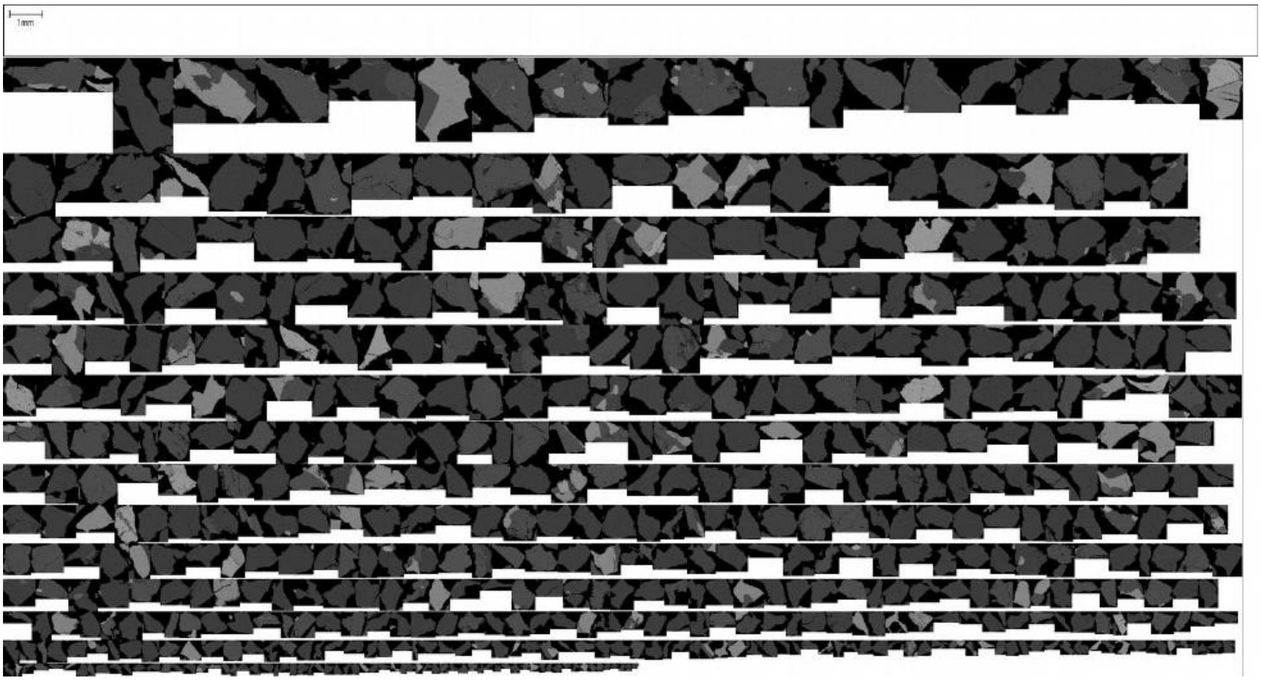


Figure 25: Selected example field BSE and particle map images for the Bjerkreim New Zone sample + 250 µm size fraction



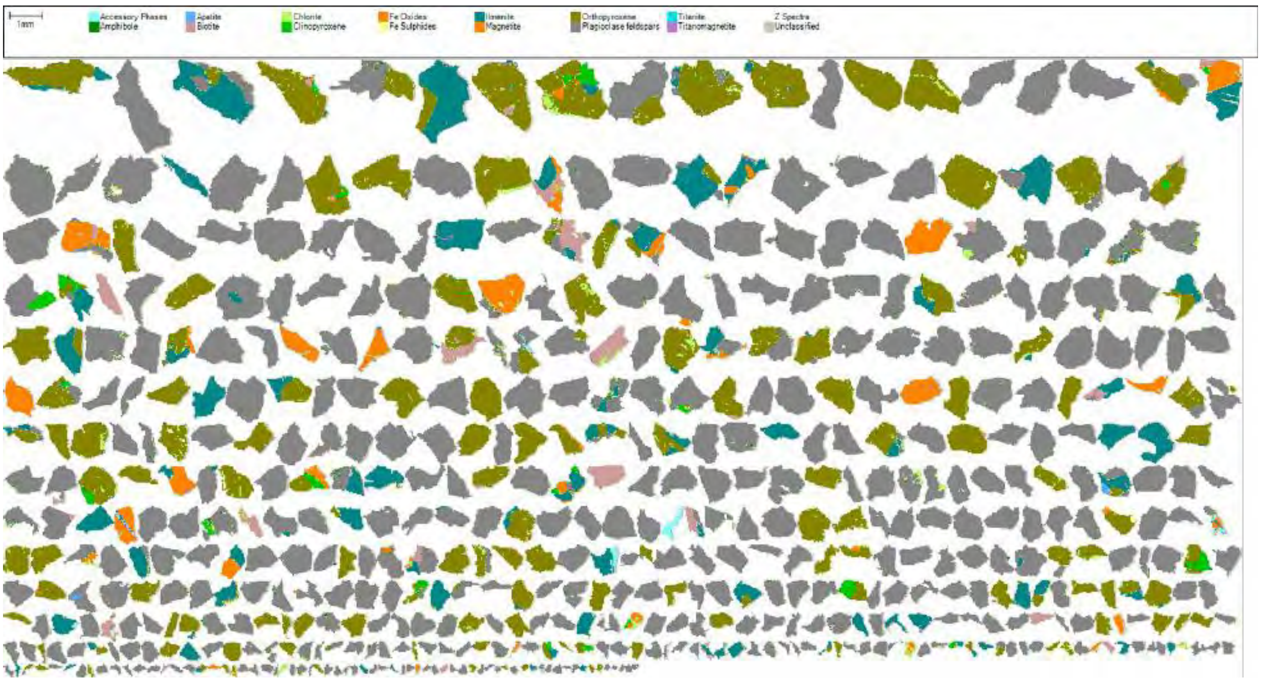
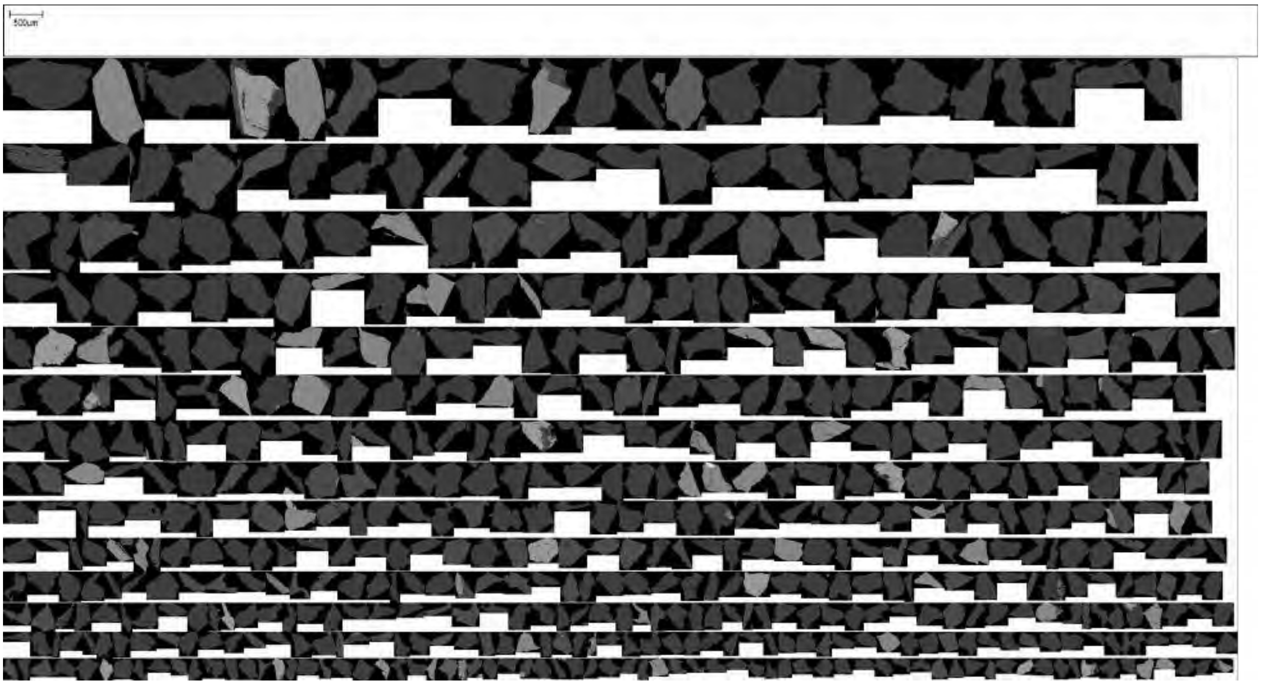
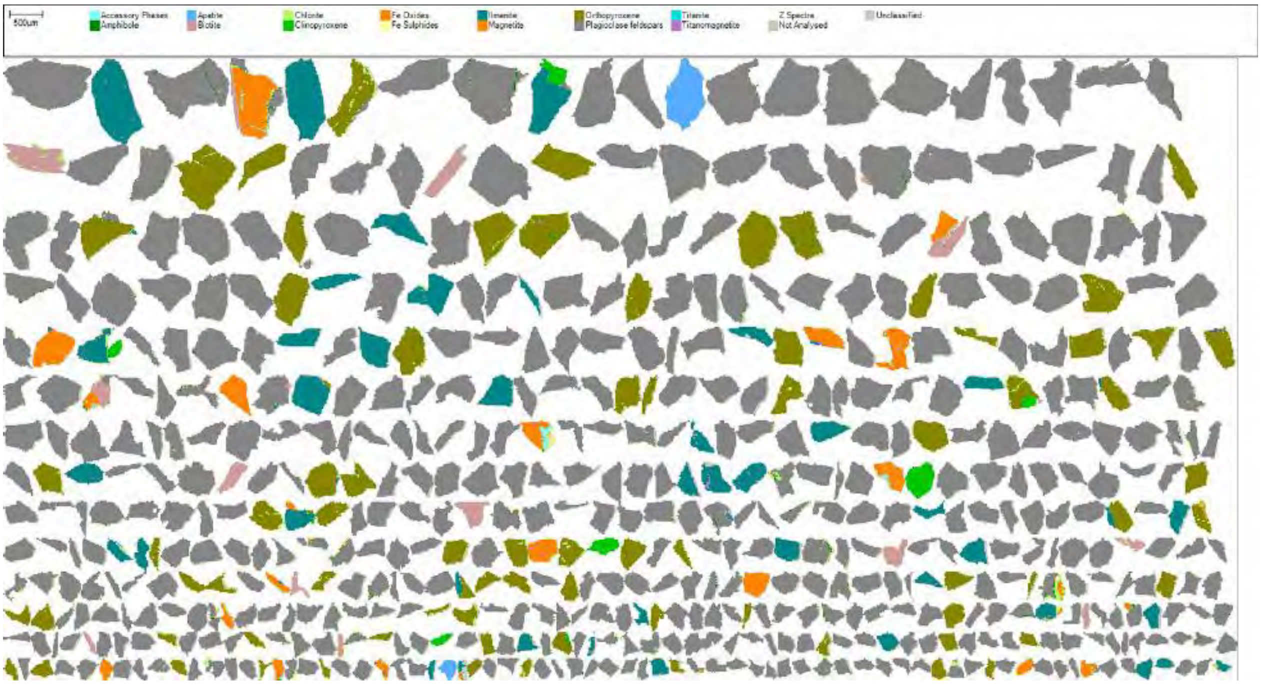


Figure 26: Selected example field BSE and particle map images for the Bjerkreim New Zone sample -250 µm size fraction





Bjerkreim Zone B

Figure 27: Selected example field BSE and particle map images for the Bjerkreim Zone B sample +1 mm size fraction

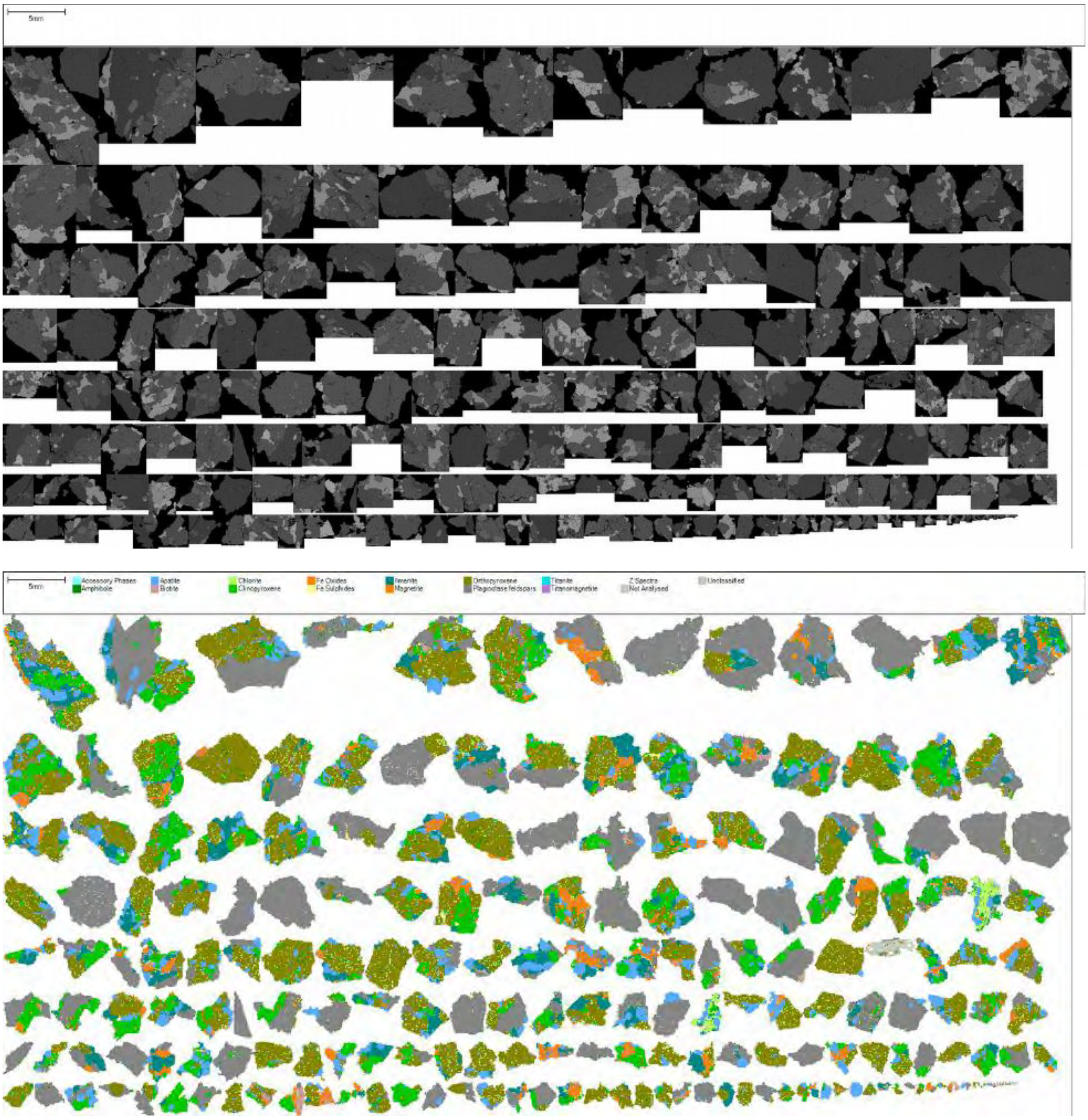


Figure 28: Selected example field BSE and particle map images for the Bjerkreim Zone B sample +500 µm size fraction

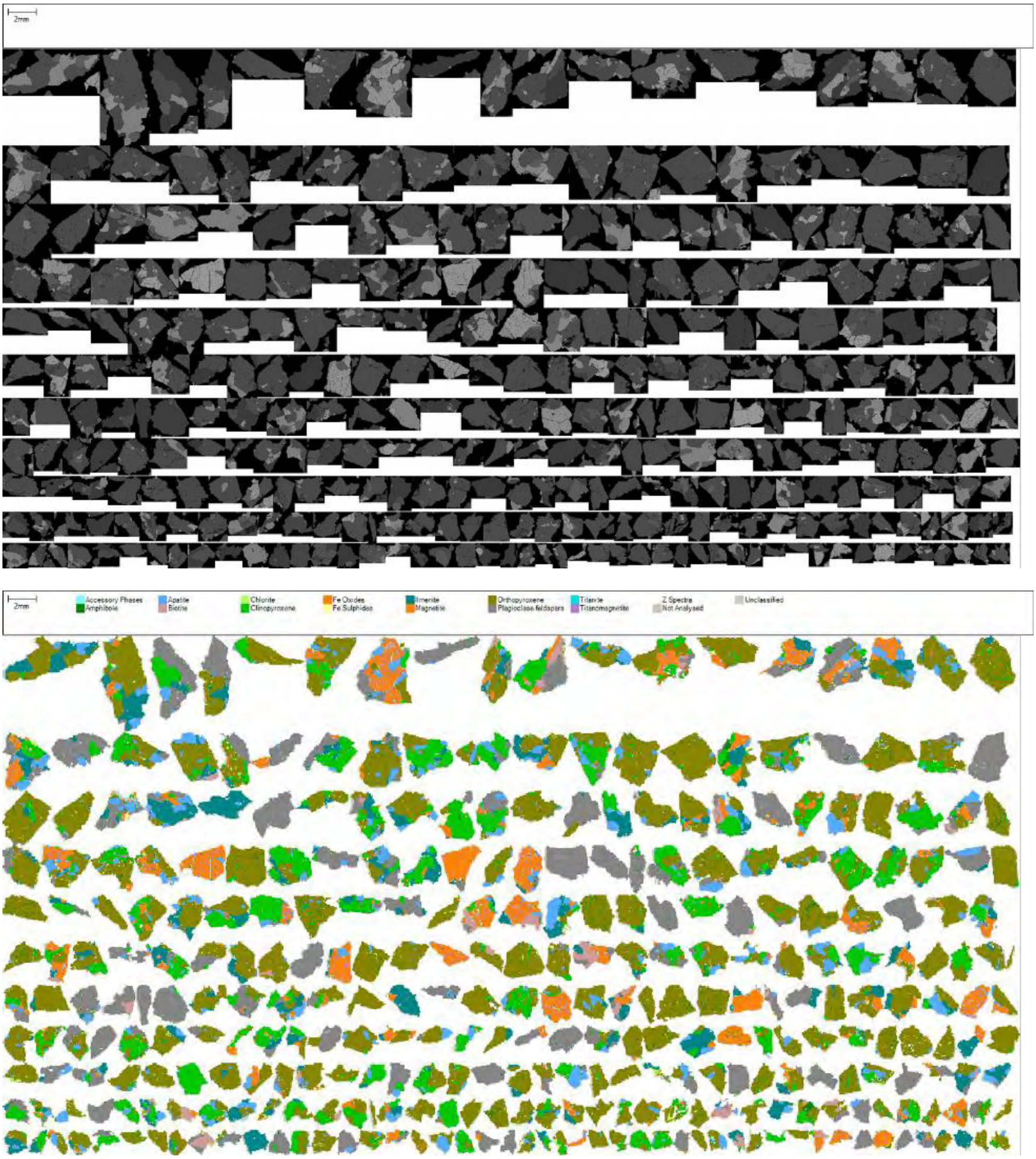


Figure 29: Selected example field BSE and particle map images for the Bjerkreim Zone B sample +250 µm size fraction

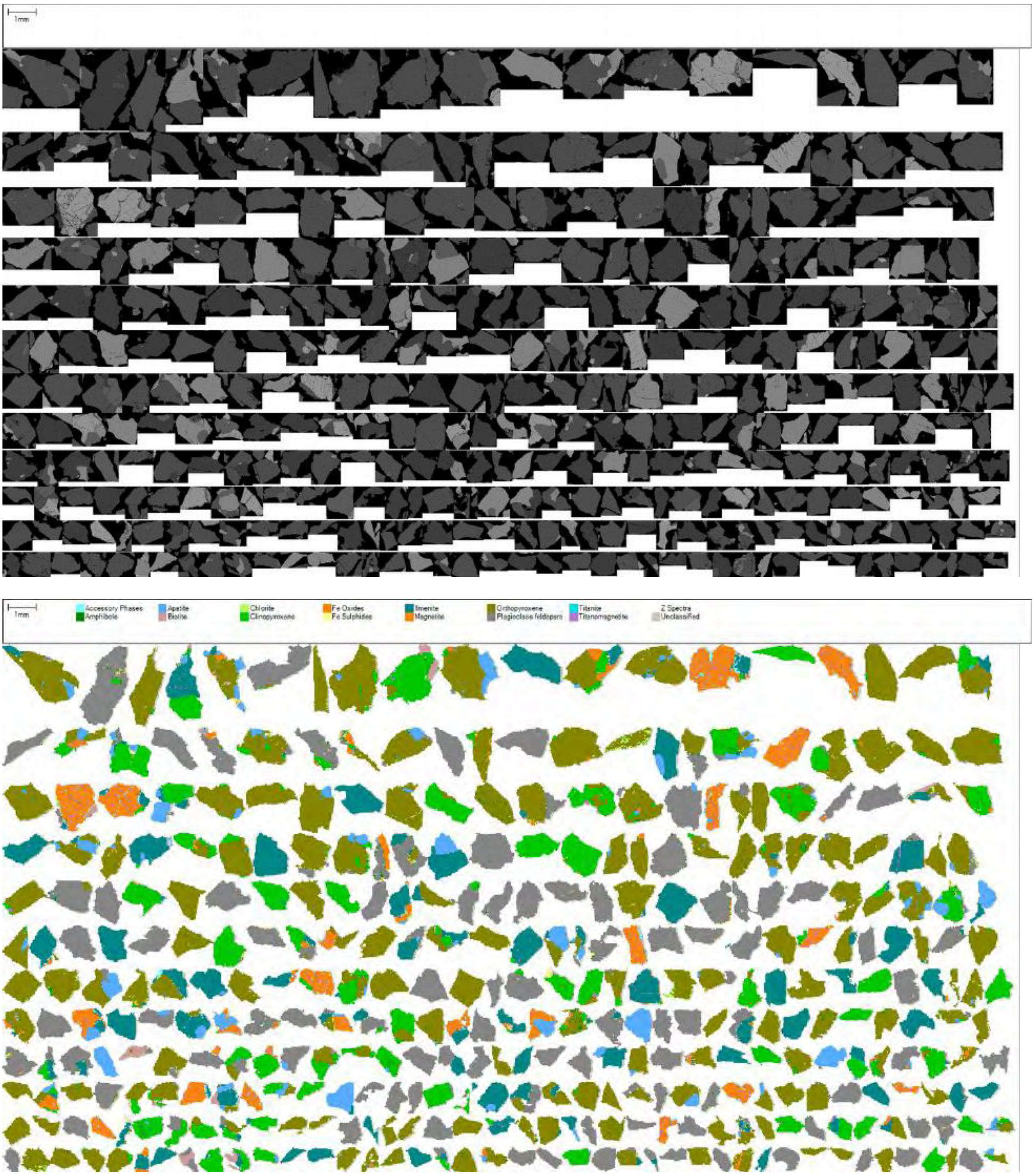
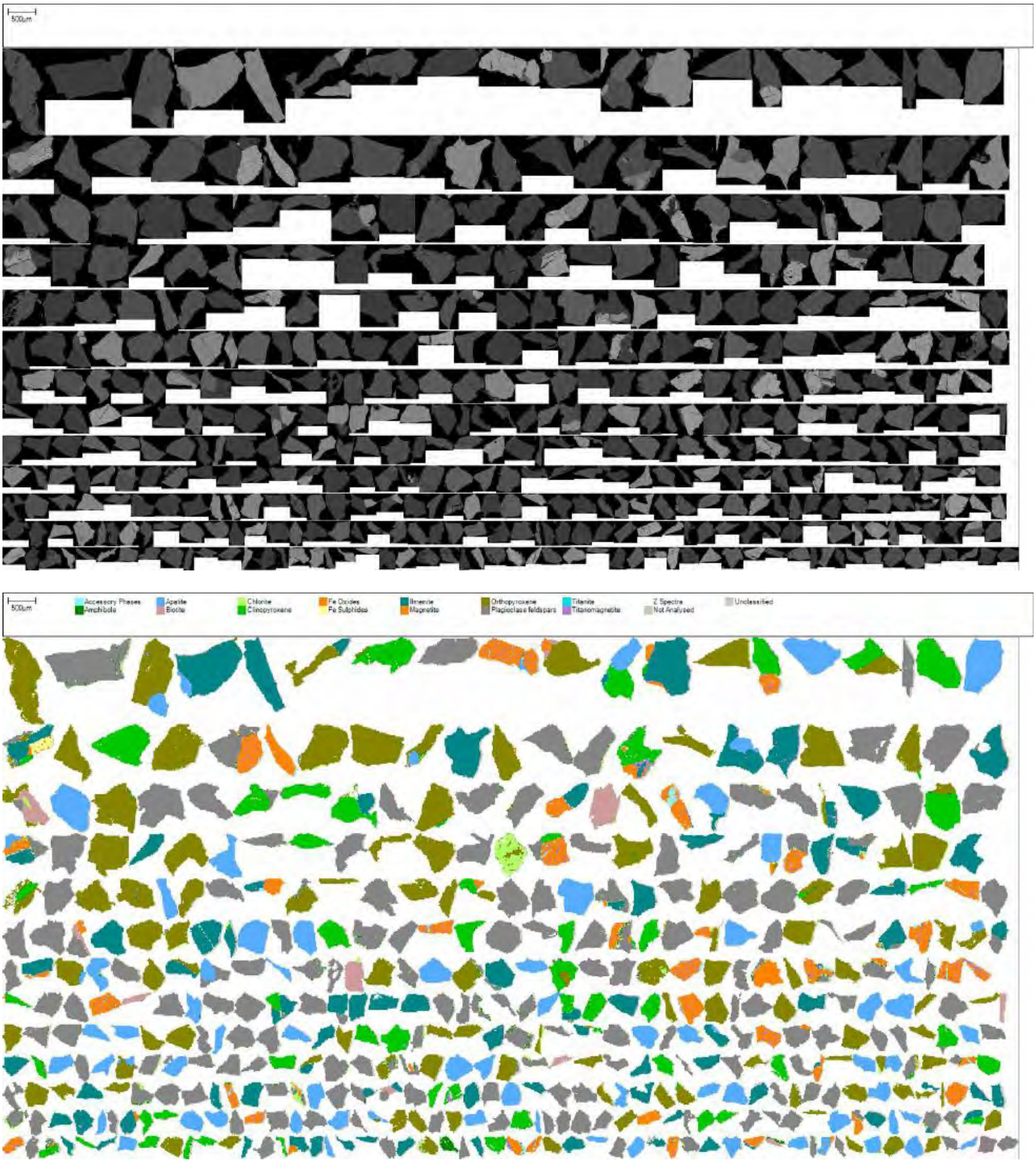


Figure 30: Selected example field BSE and particle map images for the Bjerkreim Zone B sample -250 µm size fraction



Bjerkreim Zone C

Figure 31: Selected example field BSE and particle map images for the Bjerkreim Zone C sample +1 mm size fraction

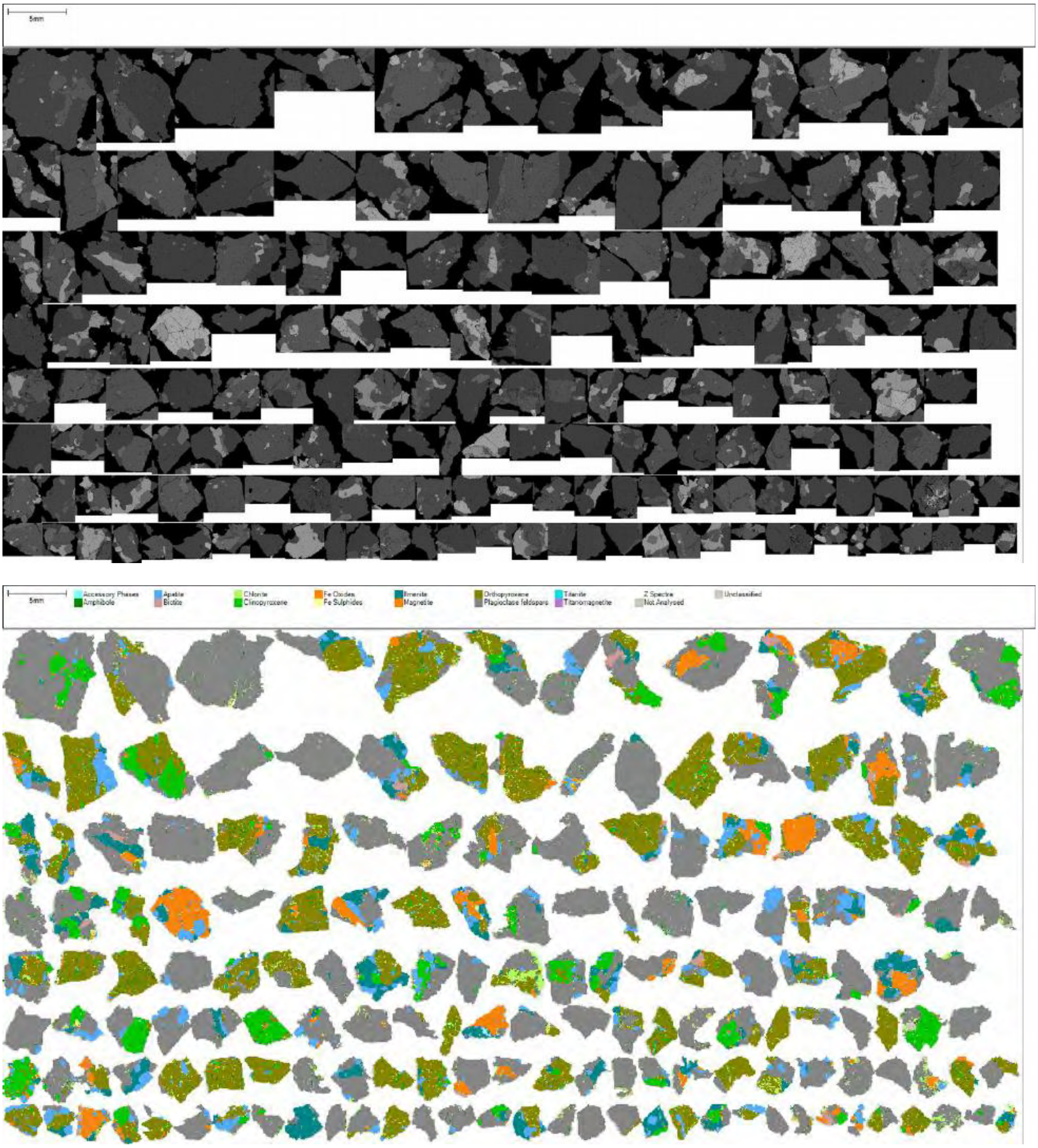


Figure 32: Selected example field BSE and particle map images for the Bjerkreim Zone C sample +500µm size fraction

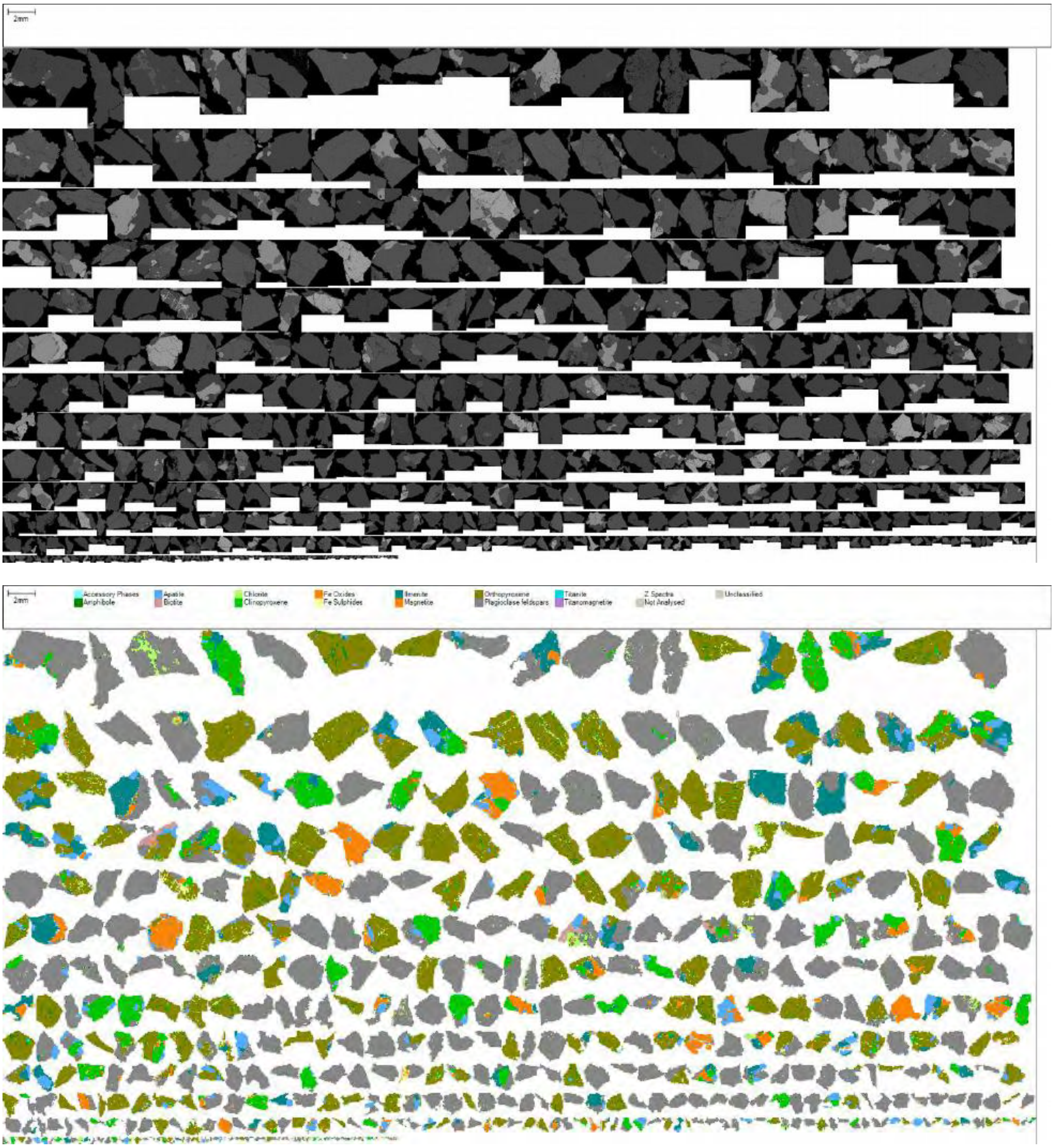


Figure 33: Selected example field BSE and particle map images for the Bjerkreim Zone C sample +250 µm size fraction

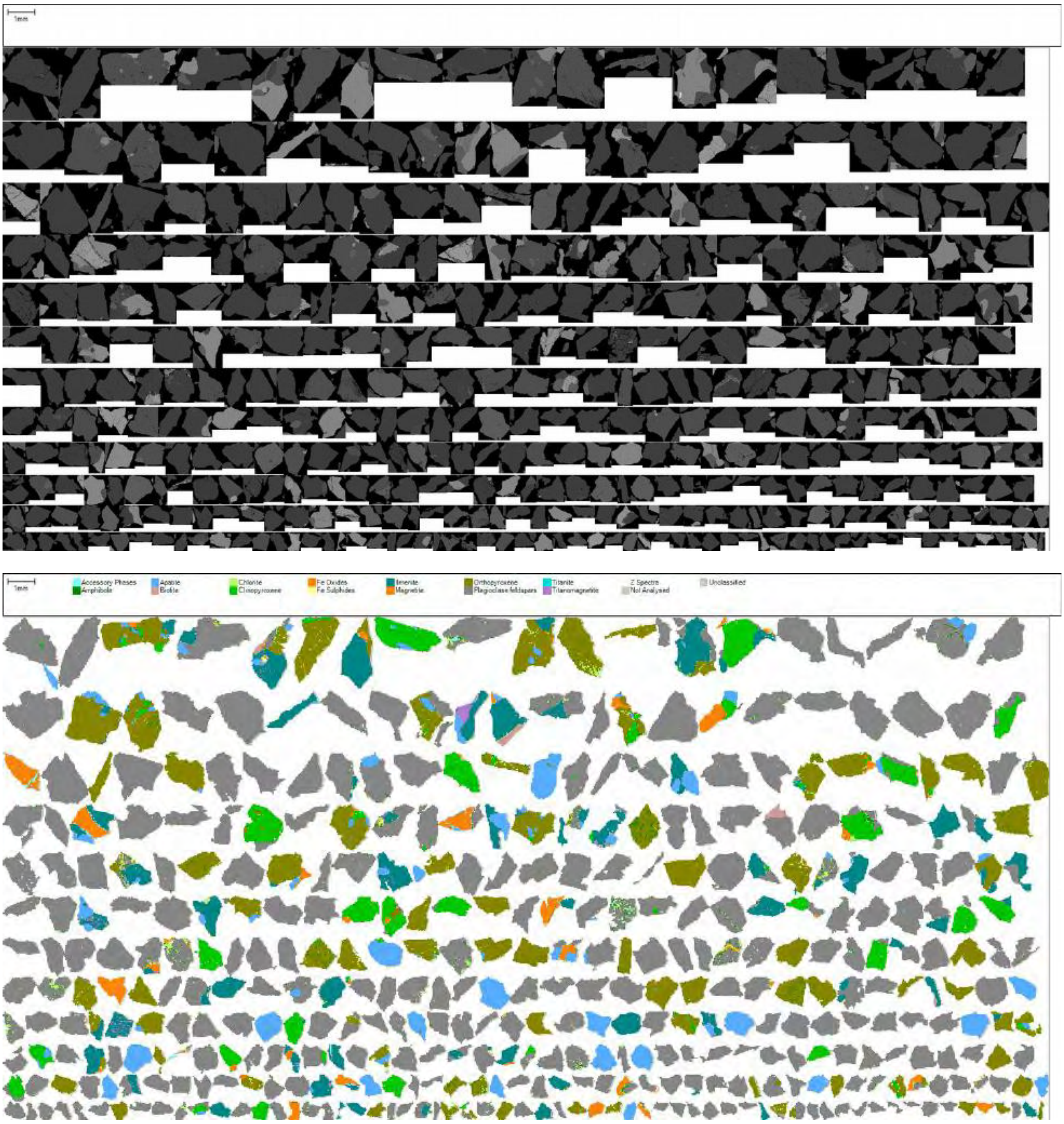


Figure 34: Selected example field BSE and particle map images for the Bjerkreim Zone C sample -250 µm size fraction