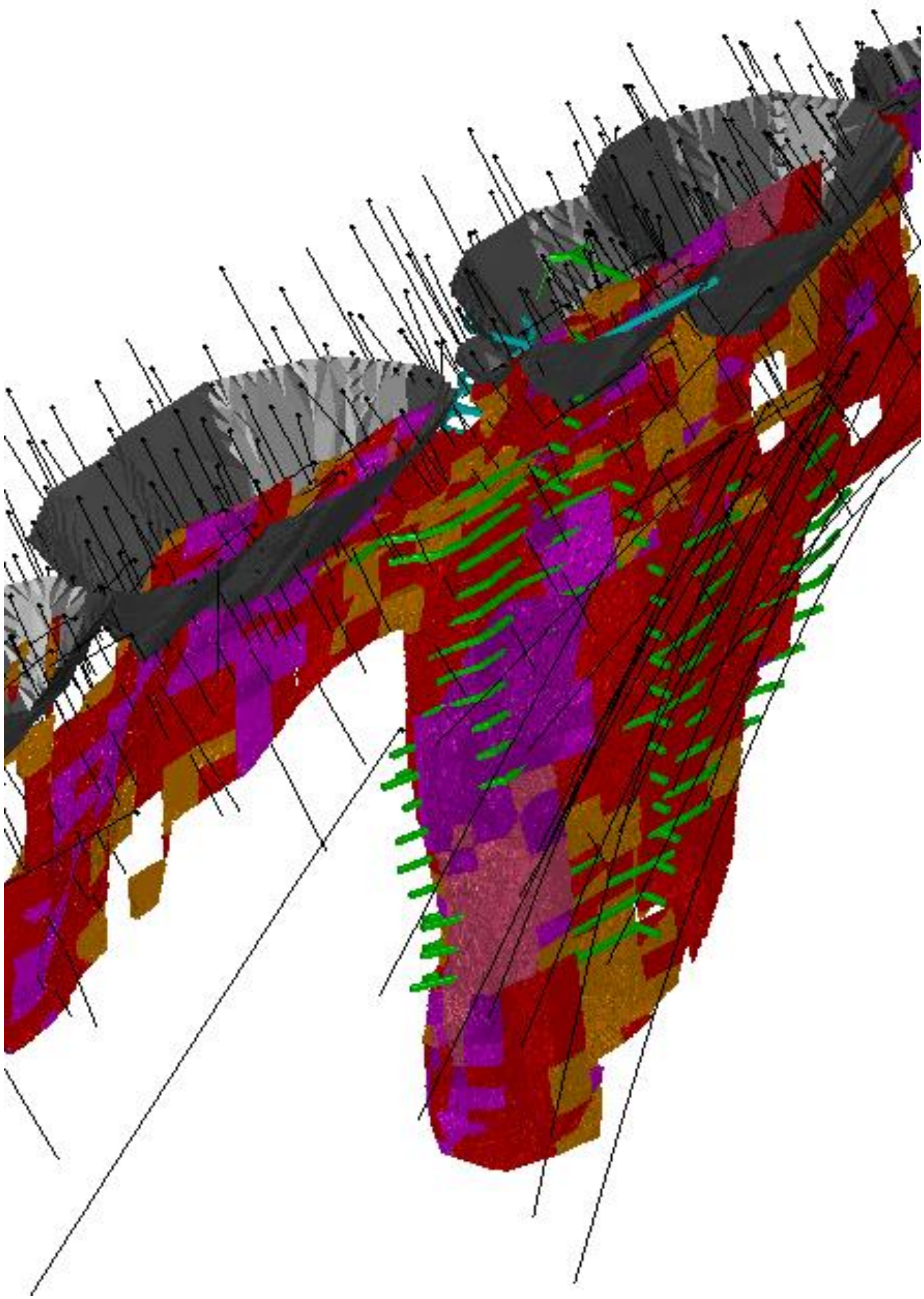
Nov 2020

Mineral resource inventory report – Viscaria D zone



Jari Juurela

Copperstone Resources AB

Exploration Manager, MAusImm

On the left. Viscaria D zone block model with copper colouring, scoping study mine designs and drillholes

TABLE OF CONTENTS

1.0 PERC STANDARD COMPLIANCE AND COMPETENCY

Mineral resource estimation of the Viscaria project D zone was completed between July 2020 and November 2020. Mineral resource inventory was completed fully by Copperstone Resources AB with a team of people with different backgrounds and expertise. Information impacting the RPEEE (reasonable prospect of eventual economic extraction) of the project was compiled by technical experts of each area of responsibility. Each expert has more than 15 years of experience in their area of responsibility. All are full time employees of the Copperstone Resources. Roles and responsibilities have been summarised in the table 1.1.

Table 1.1. Roles and responsibilities of Mineral Resource Inventory.

Area of responsibility	Responsible person	Responsible competent person
Environmental work	Anders Lundqvist	Jari Juurela
Exploration and geology	Marcello Imana	Jari Juurela
Resource estimation	Jari Juurela	Jari Juurela
Mining	Glenn Nilsson	Jari Juurela
Mineral processing	Glenn Nilsson	Jari Juurela
Compiling report	Jari Juurela	Jari Juurela

Jari Juurela is a full-time employee of Copperstone Resources and he works as an Exploration Manager. He is a Member of AusIMM which is a Recognised Professional Organisation (RPO) of PERC. Mr. Juurela has over 20 years of experience in exploration and mining industry, which includes over 15 years of experience in resource estimation of polymetallic deposits with geostatistical methods.

Contributions to mineral resource reporting was also given by Project Geologist Diane Feve and Geologists Anne Ylinen and Erik Solander. Diane Feve has completed lithological and mineralisation interpretations under supervision of the Competent Person and she was the main geologist completing geological logging for Copperstone Resources D zone drilling campaigns. Anne Ylinen and Erik Solander contributed to the reporting.

Detailed external audit of the mineral resource estimation was completed by Chris Grove from Measured Group. He was the Competent Person of November 2015 D zone mineral resource inventory.

Mineral resource inventory has been reviewed by Thomas Lindholm from Geovista. Thomas has extensive experience of mineral resources and estimation. Thomas Lindholm signs off mineral resources as Qualified Person and impartial Qualified Person of Copperstone Resources.

2.0 GENERAL

Mineral resource inventory for Viscaria Project D zone was completed to update mineral resources after over 10 000 metres of extensional exploration drilling. Previous mineral resource estimation was completed November 2015 and it was used as a block model for Viscaria Project Scoping study. The new updated block model will be used as base of the mine planning for Viscaria project pre-feasibility study. The block model will further be updated Q1 2021 when remaining drillholes are validated and reported to create the final pre-feasibility study block model.

2.1 PAN-EUROPEAN STANDARD FOR REPORTING OF EXPLORATION RESULTS, MINERAL RESOURCES AND MINERAL RESERVES – THE PERC REPORTING STANDARD

Copperstone Resources AB reports Mineral Resources in compliance with the requirements of the reporting guidelines defined by Pan-European Standard for Reporting of Exploration Results, Mineral Resources and Mineral Reserves – The PERC Reporting Standard. PERC is a member of CRIRSCO, the Committee for Mineral Reserves International Reporting Standards, and the PERC Reporting Standard is fully aligned with the CRIRSCO Reporting Template. PERC standard is used by companies listed on markets in Europe. Mineral resource inventory for Viscaria D zone was created using PERC standard 2017 as a minimum requirement.

Viscaria D-zone Mineral resource inventory report follows PERC standard guiding principles – transparency, materiality, competence and impartiality.

- ***Transparency***: Report is provided with sufficient information, the presentation of which is clear and unambiguous.
- ***Materiality:*** Report contains all the relevant information available at the date of disclosure, which investors and their professional advisers would reasonably require, and reasonably expect to find in a Public Report, for the purpose of making a reasoned and balanced judgement regarding the Exploration Results, Mineral Resources or Mineral Reserves being reported.
- ***Competence:*** Report is based on work that is the responsibility of suitably qualified and experienced persons who are subject to an enforceable professional code of ethics and rules of conduct.
- ***Impartiality:*** Author of the report is satisfied and able to state without any qualifications that his work has not been unduly influenced by the organisation, company or person commissioning a Public Report or a report that may become a Public Report; that all assumptions are documented; and that adequate disclosure is made of all material aspects, including any relevant direct or indirect relationship (such as employment or ownership of shares) between the Competent Person and the owners of the project on which he or she is reporting, that the informed reader may require to make a reasonable and balanced judgement thereof.

2.2 PERC DEFINED TERMINOLOGY FOR REPORTING MINERAL RESOURCES

PERC standard sets out defined terminology which must be followed in the Mineral Resource Inventories. Figure 2.1 shows definition of Mineral Resource Classifications and their relationship to Mineral Reserves, which was followed throughout the Mineral Resource Inventory.

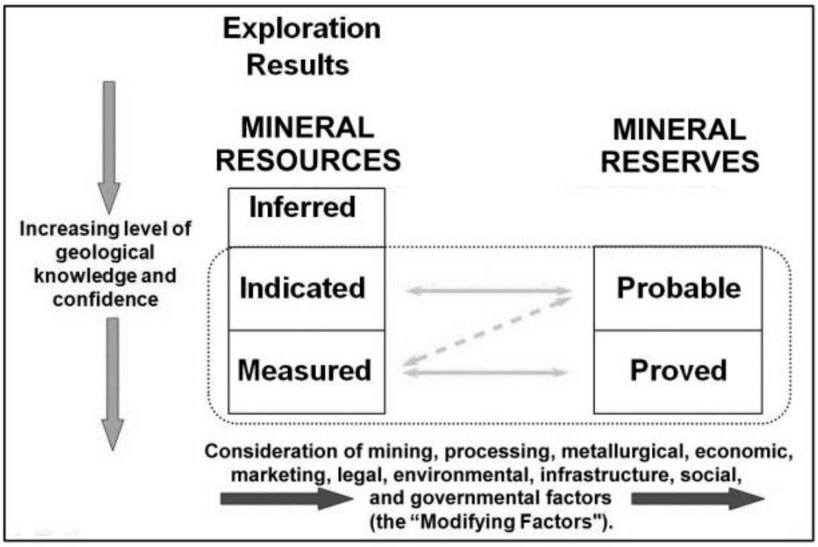


Figure 2.1 Definition of Mineral Resources classifications and relationship to Mineral reserves.

3.0 INTRODUCTION TO THE PROJECT

The Viscaria project aims at re-start extraction and processing of high grade Cu-sulphide ores and associated Fe-oxide ores in order to generate Cu and Fe concentrates. Viscaria is located within the active Kiruna mining district of Norrbotten. Operations are planned to include open pit and underground extraction. The project contains clear signs of upside exploration potential along both underground and surface scenarios.

The ores contain a relatively simple mineralogy and are hosted within 3 separate but adjacent rock packages, displaying a stratiform and highly continuous geometry along strike.

The project should be considered potentially economic in view of the incorporation of significant new resources and conversion of historic waste-marginal unmined material from the old mine. Given the current metals prices, which are much higher than historic prices, it provides the opportunity to mine new areas that contain Cu grades lower than historically mined and with an additional upside for recovering the Fe contents in the ore.

4.0 LOCATION AND TENURE

4.1 LOCATION

The D Zone Area of the Viscaria Copper Project (the project) is located in Kiruna municipality (population 23,500), in Norrbotten County, the northernmost County in Sweden (Figure 4.1), approximately 120 km north of the Arctic Circle. The project lies approximately 5 km northwest of the city of Kiruna. It is located 270 km north-northwest of the port city of Luleå, which lies on the Gulf of Bothnia in the north of the Baltic Sea and 130 km southeast of the port city of Narvik in northern Norway. The city of Kiruna is home to the world's largest underground iron ore mine called Kirunavaara 'Kiruna mine' that is owned by Luossavaara-Kiirunavaara Aktiebolag (LKAB), owned by the Swedish Government, which is adjacent to the Viscaria project. Kirunavaara has been in production since 1899 and to date has extracted more than a billion tonnes of magnetite.

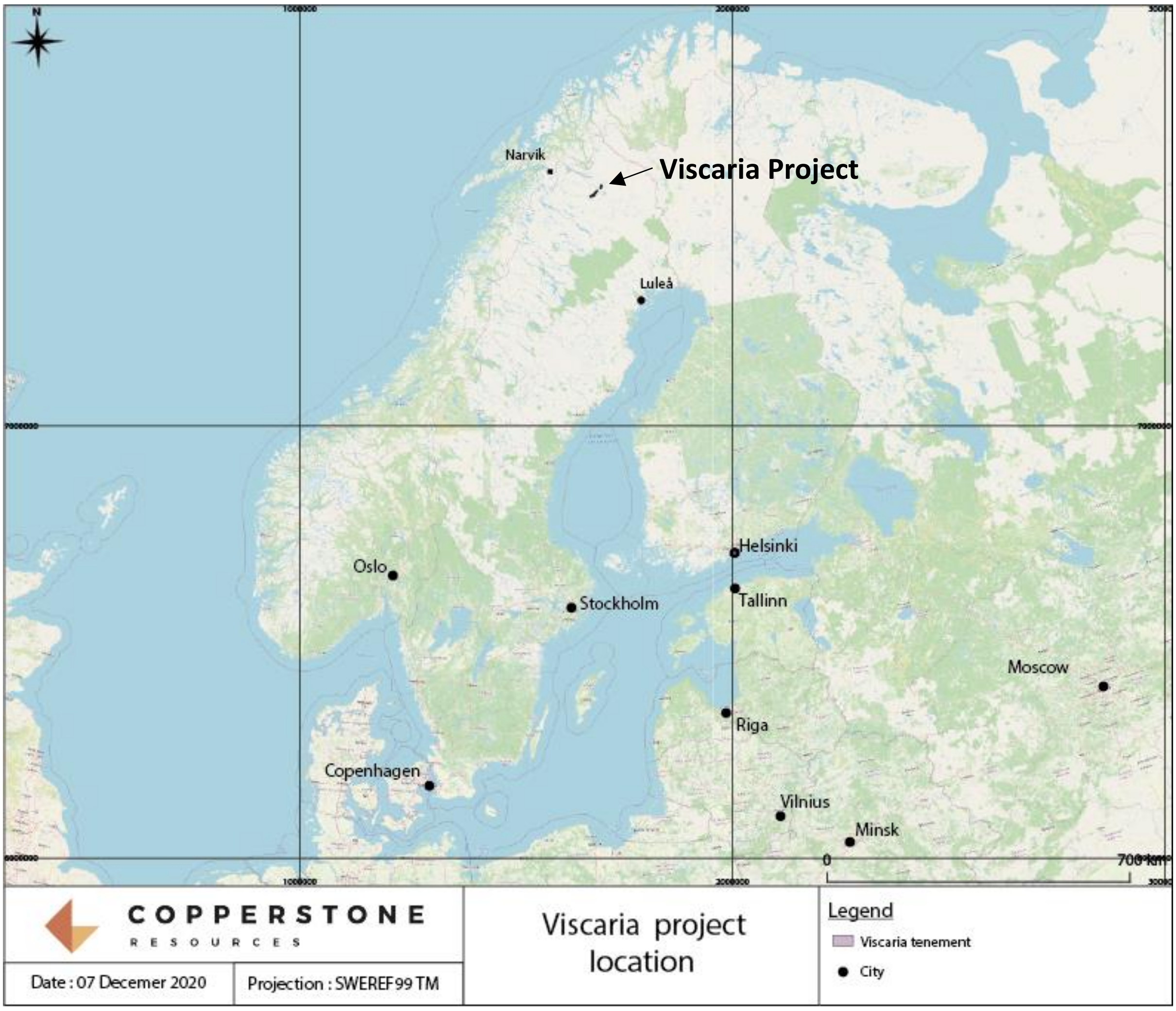


Figure 4.1. Project location

4.2 TENURE CURRENT SITUATION

As per November 10, 2020 and the date of this report, Copperstone had three approved exploitation concessions and ten exploration permits.

Copperstone has three granted processing concessions under the Minerals Act (SFS1991: 45); Viscaria K no 3 and K no 4 which were granted by Bergsstaten in January 2012 and Viscaria K no 7 which was granted in November 2014. Viscaria K no 7 has been appealed and is currently at governmental level for decision. The extent of Copperstone Resources AB tenure is shown in Figure 4.2, Figure 4.3 and Figure 4.4.

In order to restart the Viscaria mine with associated processing plants and mine waste facilities, a permit is required in accordance with the Environmental Code. Mining activities are considered environmentally hazardous activities according to Swedish law and require a permit. The environmental permit regulates how mining operation may be conducted and under what conditions. For mining operations, it is required that the permit process is conducted by the Land- and Environmental Court.

The environmental application will include present granted concessions at Viscaria no 3 and no 4. No 7 will be included in the environmental permit if a decisive positive result will come before the process is ended.

Copperstone Resources AB has started the process of obtaining land leases from the state and other landowners.

Table 4.1. Copperstone Minerals tenements status

APPROVED EXPLOITATION CONCESSION										
NAME	DIARYNR		AREA	APPL_DATE	DEC_DATE	VALIDFROM	VALIDTO	MINERAL	MUNICIPAL	OWNERS (100%)
Viscaria K nr 3	2010000482		115.701	2010-04-19	2012-02-21	2012-01-16	2037-01-16	gold, iron, copper, silver, zinc	KIRUNA	Avalon Minerals Viscaria AB
Viscaria K nr 4	2010000514		30.0319	2010-04-19	2012-02-21	2012-01-16	2037-01-16	gold, iron, copper, silver, zinc	KIRUNA	Avalon Minerals Viscaria AB
Viscaria K nr 7*	2011000312		63.81	2010-04-19	2018-05-03	2018-03-26	2043-03-26	copper	KIRUNA	Avalon Minerals Viscaria AB
VALID EXPLORATION PERMIT										
NAME	LICENCEID	DIARYNR	AREA [ha]	APPL_DATE	DEC_DATE	VALIDFROM	VALIDTO	MINERAL	MUNICIPAL	OWNERS
Viscaria nr 101*	2002:104	2002000538	1472.29	2002-07-10	2015-11-12	2002-10-16	2017-10-16	copper	KIRUNA	Avalon Minerals Viscaria AB
Yhteinenjärvi nr 1	2015:8	2014001160	963.26	2014-09-23	24/09/2020	2015-01-22	2020-01-22	iron	KIRUNA	Avalon Minerals Viscaria AB
Viscaria East	2017:93	2017000170	211.94	2017-02-24		2017-06-09	2020-06-09	copper	KIRUNA	Avalon Minerals Viscaria AB
Viscaria nr 1	2008:119	2007001504	818.71	2007-11-16		2008-06-24	2020-06-24	copper	KIRUNA	Avalon Minerals Viscaria AB
Nihka East	2015:86	2015000400	144.14	2015-04-14	2018-09-13	2015-06-16	2021-06-16	copper	KIRUNA	Avalon Minerals Viscaria AB
Kirkkovaarti nr 1	2018:130	2018000562	386.37	2018-07-11	2018-11-08	2018-11-08	2021-11-08	copper, lead, zinc, iron, gold, silver	KIRUNA	Avalon Minerals Viscaria AB
Rengarde nr 1	2018:131	2018000563	3517.31	2018-07-11	2018-11-08	2018-11-08	2021-11-08	copper, lead, zinc, iron, gold, silver	KIRUNA	Avalon Minerals Viscaria AB
Viscaria nr 112	2011:197	2011000457	1944.82	2011-04-07	2020-09-01	2011-12-05	2021-12-05	copper	KIRUNA	Avalon Minerals Viscaria AB
Viscaria nr 107	2009:136	2009000673	1842.75	2009-05-07	2020-05-07	2009-08-10	2022-08-10	copper	KIRUNA	Avalon Minerals Viscaria AB
Goddevarri nr 101	2019:94	2019000924	148.44	2019-08-21	2019-12-04	2019-12-04	2022-12-04	copper, lead, zinc, iron, gold, silver	KIRUNA	Avalon Minerals Viscaria AB
		Total [ha]:	19664.46			TOTAL APPROVED				
APPLIED EXPLORATION PERMIT										
NAME	LICENCEID	DIARYNR	AREA	APPL_DATE	DEC_DATE	VALIDFROM	VALIDTO	MINERAL	MUNICIPAL	OWNERS
Viscaria East	2017:93	2020000634	211.94	2020-06-05		2017-06-09	2020-06-09	copper	KIRUNA	Avalon Minerals Viscaria AB
Viscaria nr 1	2008:119	2020000687	818.71	2020-06-22		2008-06-24	2020-06-24	copper	KIRUNA	Avalon Minerals Viscaria AB
		Total [ha]:	1030.65			TOTAL APPLIED				
*)	Exploitation Concession Viscaria nr 7 has been appealed to the Swedish Government. Exploration licence Viscaria 101 is valid until the Government's final decision regarding Viscaria nr 7.									

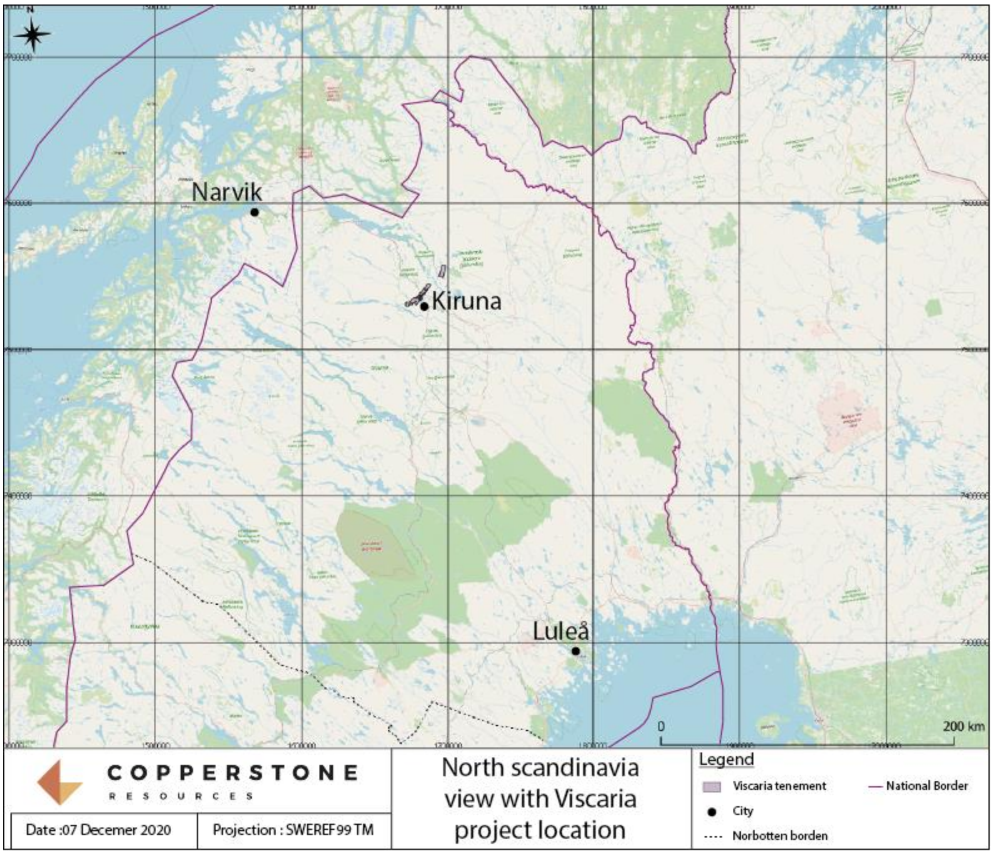


Figure 4.2. Copperstone Minerals tenements Norrbotten County, Sweden

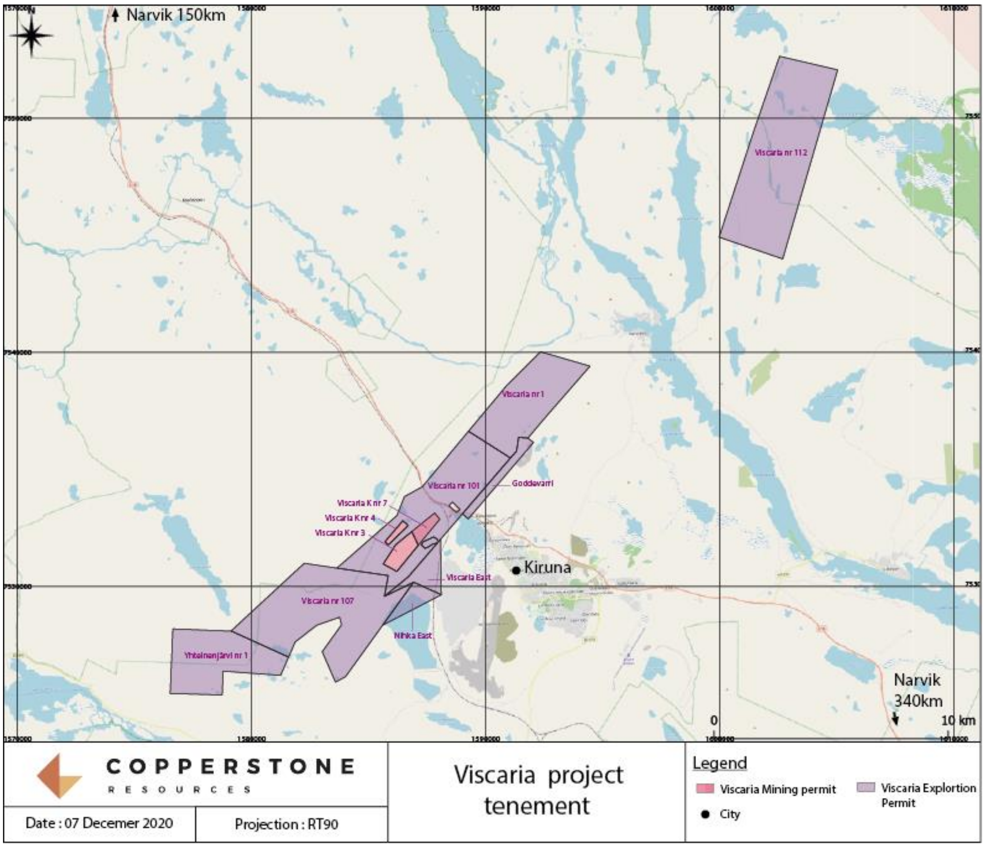


Figure 4.3. Viscaria Copper Project Tenement Locations

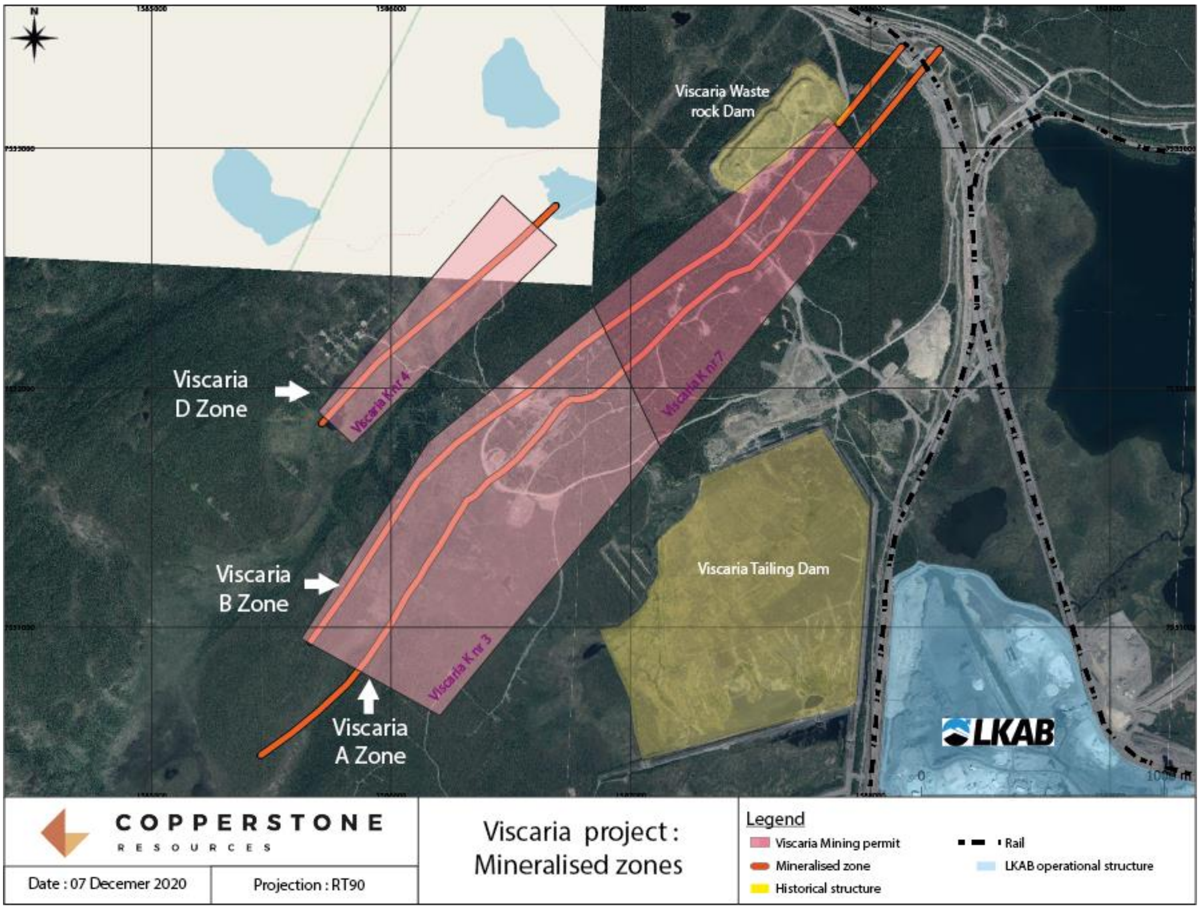


Figure 4.4. Viscaria Copper Project Mineralised Zones ('A, B and D Zones')

4.3 TOPOGRAPHY, LAND USE AND CLIMATE

The location of the mine site, 150 km north of the polar circle and 250 km east of the North Atlantic sea strongly affects the climate in the area. February has the lowest temperature down to -21° C. The warmest month is July, when the temperature normally varies between 9,2° C to 17,6° C. Precipitation is greatest during the summer months with an average value of 94 mm during the month of July, followed by August with 68 mm. The snow depth average is 75 cm, and snow and ice cover the landscape and lakes from October to May. The melting of the frozen precipitation results in a short and intensive spring flood normally lasting a few weeks in May to June.

The average value of the wind speed at Kiruna Airport measuring station is 3,5 m/s and dominating wind direction is from south to south-west

Mining in subarctic conditions means climatic risk for machinery and labour force, but 100 years of mining tradition in the surrounding underground and open pits has developed modern technology and working conditions that are very well adapted for the environmental conditions.

Water supply and mine drainage systems must be adapted to arctic dry periods during winter and high flows during late spring and summer, to support process- and drilling water.

Existing and historic mining activities strongly affect the adjacent landscape of Kiruna town. The view of present mining at LKAB Kiirunavaara magnetite mine and old facilities from the former operations at Luossavaara and at Viscaria mines are typical for the city of Kiruna. All mine buildings of the old Viscaria mine been demolished and the area has been largely reclaimed after the mine closed in 1997. Previously used waste rock dumps and tailings with a clarifying pond remain as new formations in the landscape with clear signs of previous land use.

Natural surrounding landscape consists of vast lowland alpine forest terrain where heights vary between 450 to 600 meters above sea level and wetland with bogs and small lakes in valleys. High western mountain peaks up to 2000 m above sea level are visible from 500 km to the west, with the wind turbines on the mountain ridge Peuravaara in the foreground.

The A-Zone and B-Zone deposits at Viscaria are situated under the Peuravaara ridge, with six wind turbines located on the ridge. The D-zone is located west from the A and B-zones in a wetland area that extend west of the ridge. Peuravaara and small moraine ridges in the south creates the watershed between the two big rivers Kalix river to the southwest and Torne river to north and east. The watercourses that will be affected by the future Viscaria mine runs to Pahtajoki and flows northwards to Rautas river. As a result of LKAB's underground mining, the lake Luossajärvi has reduced in size and volume. In connection with the damming of the lake, the effluent loading changed, and it now runs through a channel that is situated directly south of the railway and E10 road north of Viscaria. The outflow of Luossajärvi runs also towards Pahtajoki.

The stream Pahtajoki is affected by the discharge from old mine and as well - by polluted water from the LKAB area.

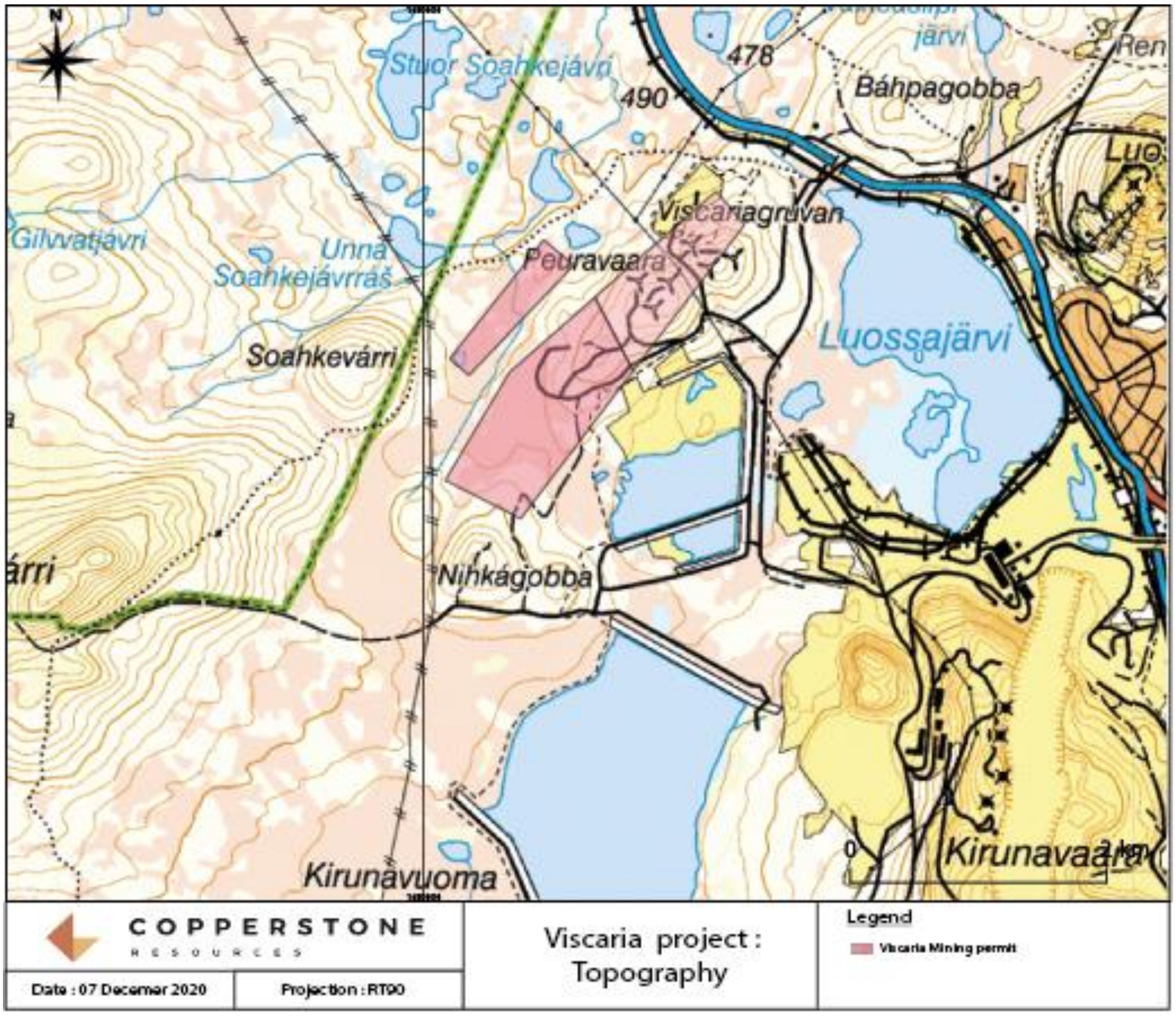


Figure 4.5. Topography

4.4 ACCESS AND INFRASTRUCTURE

The Viscaria Copper Project lies adjacent to well established infrastructure as a result of the long history of iron ore mining at LKABs Kirunavaara 'Kiruna' underground iron ore mine.

The broader Viscaria Copper Project under exploration tenure is traversed by the sealed E10 highway that runs near the ice-free port city of Narvik on the Norwegian Sea, to Kiruna and then on to the port city of Luleå on the Baltic Sea. The project area is also crossed by rail lines which run to both the ports of Narvik and Luleå.

D Zone lies to the southwest of the highway, rail line and powerlines. Figure 4.6 shows the location of the project and local infrastructure and confirms there are no physical or administrative impacts on the project from this infrastructure.

Swedish Transport Administration (Trafikverket) is the government agency in Sweden responsible for long-term infrastructure planning for road, rail, shipping and aviation. It owns, constructs, operates and maintains all state-owned roads and railways. The agency has indicated that while both national rail lines out of Kiruna (to either Narvik or Luleå) are under heavy load, there would be capacity for the small volumes required for transportation of copper concentrate from the Viscaria Copper Project.

Additionally, Trafikverket are responsible for the design and construction of the new 'E10' by pass road (to by-pass the township of Kiruna) and a new '870' road alignment to the public rail terminal. Both projects are required as part of the caving subsidence zone works required for the continued operation at LKAB Kiruna. The projects have commenced work and are due for completion in 2017.

The new roads (E10 and 870) will allow Copperstone to have direct access to the public rail terminal by road without having to truck through the centre of the town. This would indicate that the project may not require a purpose built spur line for potential rail transportation, and could potentially utilise the public facility.

Sweden has an extensive hydroelectric power generation network that accounts for approximately 50% of the countries power usage. Seven of the 15 largest hydroelectric stations occur along the Lule River in Norrbotten Province, within 240 km of the project area. The seven local hydroelectric power stations generate 3,166 Megawatts of power, with the largest hydroelectric station, 'Harsprånget' generating 977 Megawatts of power.

The Viscaria Copper Project is traversed by a high voltage powerline with hydropower supply capacity this is shown in Figure 4.6, which also shows the new electrified national rail line diversion (completed 2013) and the location of the former Outokumpu tailings storage facility and former plant site are also indicated.

Preliminary discussions have been held with both the Trafikverket and the Swedish power company, wholly owned by the Swedish government (Vattenfall), as to the provision of rail services and power purchase agreements respectively for future project requirements.

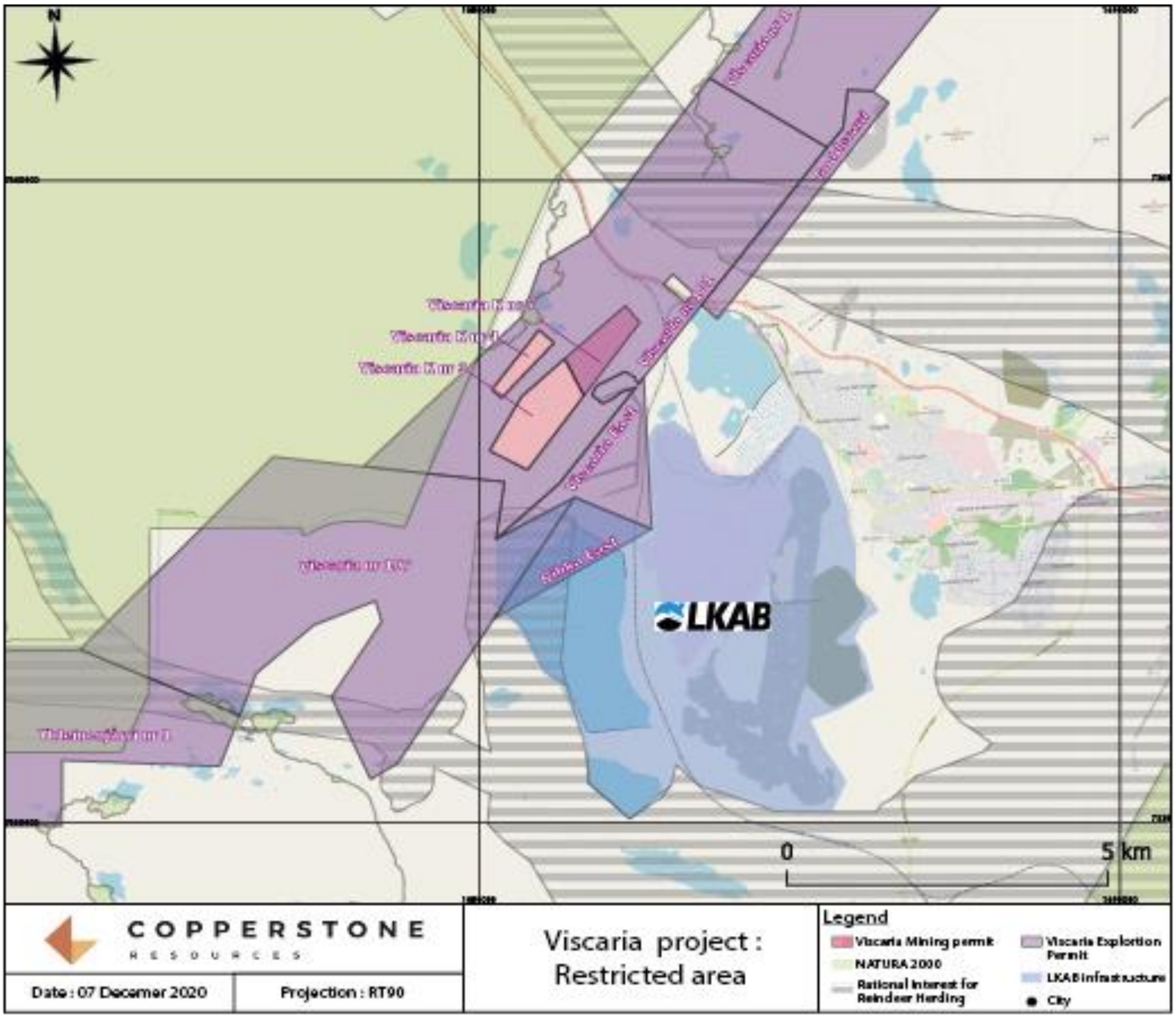


Figure 4.6. Access and Infrastructure Location plan

4.5 RESTRICTED OR CONSTRAINED AREAS

The Viscaria Copper Project is located within an area defined by Sweden to have multiple categories of 'National Interest' declared areas including; Minerals, Reindeer Herding and Cultural Heritage.

The Viscaria Project area is located within the area defined as a 'National Interest for Minerals' as shown on Figure 4.6, shows that D Zone in particular is located to the west of an area defined as 'National Interest for Cultural Heritage' and between, but not covered by, areas declared as 'National Interest for Reindeer Herding'.

The Viscaria mine is surrounded by national interests for reindeer husbandry. Migration routes of national interest run north, south and west of the mining area. There are areas of national interest south of the mining area in the form of resting pastures and a difficult passage. The Viscaria mine is mainly located within Laeva's Sami village's reindeer husbandry area, but also touches on Gabna Sami village's reindeer husbandry area

The project is not encroached upon by any declared National Parks or Wilderness areas. Natura 2000 areas (under the EU Habitats Directive, 1992) are located approximately 300 m to 700 m west of the Viscaria project area (Figure x.x) but do not encroach upon it.

Six privately owned wind turbines are located approximately 1 km east of D Zone on the topographic high over the A Zone deposit.

The area around D Zone is used by recreational groups in the winter for cross country skiing and skidoo riding. In the summer months the area is occasionally used by hikers. The terrain is swampy and so small bridges exist in some areas for access.

4.6 CULTURAL HERITAGE

The Sami are an indigenous people with their traditional lands situated in the very north of Europe, in Sápmi, in an area which stretches across the northern parts of Norway, Sweden, Finland and the Kola Peninsula. The Sami are Europe's only indigenous people and by being defined as an indigenous people, their rights are defined and/or protected in a number of international declarations and conventions. In Sweden, the Sami also have some constitutional protection as they are defined as an ethnic minority.

Reindeer herding is the central livelihood and cultural characteristic of the traditional Sami lifestyle. In Sweden, reindeer herders have grazing rights on approximately 40% of the country. The Swedish reindeer herding area is divided into 51 reindeer herding cooperatives, referred to as “Samebyar” (Swedish for Sami villages).

A Sami village means both a geographical area over which reindeer may graze, a type of cooperative work organisation, as well as an economic activity. Reindeer herding is described and protected by the Reindeer Husbandry Act (1971) which gives the Sami who belong to a Sami village, rights to use land and water for reindeer herding and associated activities such as hunting and fishing. Within a Sami village pasture area, members may also build cabins and facilities for the reindeer herding, and collect fuel and timber for subsistence and handicraft wood. These rights are based on customary law and immemorial rights, that is, that the Sami have hunted, fished and used these lands for a long time.

The Sami village in the general area of the D Zone mineral deposit is the Laevas Sami village. To the north of D Zone, and north of the E10 highway, is the Gabna Sami village. Within the area covered by a Sami village there are several reindeer herding enterprises consisting of one or more owners. The Sami village is administered by a Board of Directors elected at the AGM and the Board is the Sami village's highest decision-making body. The responsibility for public governance and supervision of reindeer herding activities is shared between the Sami parliament (which is a Swedish public authority, as well as a democratically elected parliament with some limited political power) and the applicable County Administrative Board.

Significant parts of all Sami villages’ pasture areas have been classified as being of “national interest for reindeer herding”. Areas that have been given such status include migration routes, resting/grazing areas, gathering places, special grazing areas, calving areas, facilities, and even some so-called functional relationships. National interest for reindeer herding is protected under the Environmental Code, Chapter 3, Section 5.

5.0 GEOLOGICAL SETTING

5.1 REGIONAL GEOLOGY

The geology in the regional Kiruna area ranges in age from Archean to Paleoproterozoic–approximately 2.3 to 1.7 billion years (Ga). It consists of an Archean gneissic basement that is unconformably overlain by a volcanic, volcano-sedimentary and sedimentary suite of rocks referred to as the Karelian Suite. The Karelian Suite was deposited during a continental rifting event from 2.5 Ga to 2.0 Ga, creating a narrow seaway bounded by Archean terranes. At the base of the Karelian Suite is the Kovo Group, comprised of quartzite and meta-conglomerate that is overlain by basaltic and andesitic volcanic and volcanoclastic rocks. The Kiruna Greenstone Group overlies the Kovo Group and consists of a 2 km to 4 km thick pile of subaerial and submarine basalt, andesite, tuffites, volcanoclastics and chemical sediments.

The Kiruna Greenstone Group is related to a rifting event that occurred between 2.2 Ga and 2.0 Ga. Stratigraphically, the Kiruna Greenstone Group lies below the Svecofennian Suite. The Svecofennian Suite is a supracrustal sequence represented by arc-related volcanics and sediments that include the Porphyrite Group, the Porphyry Group and the younger Hauki Quartzite (Martinsson, 1997), Fig.5.1.

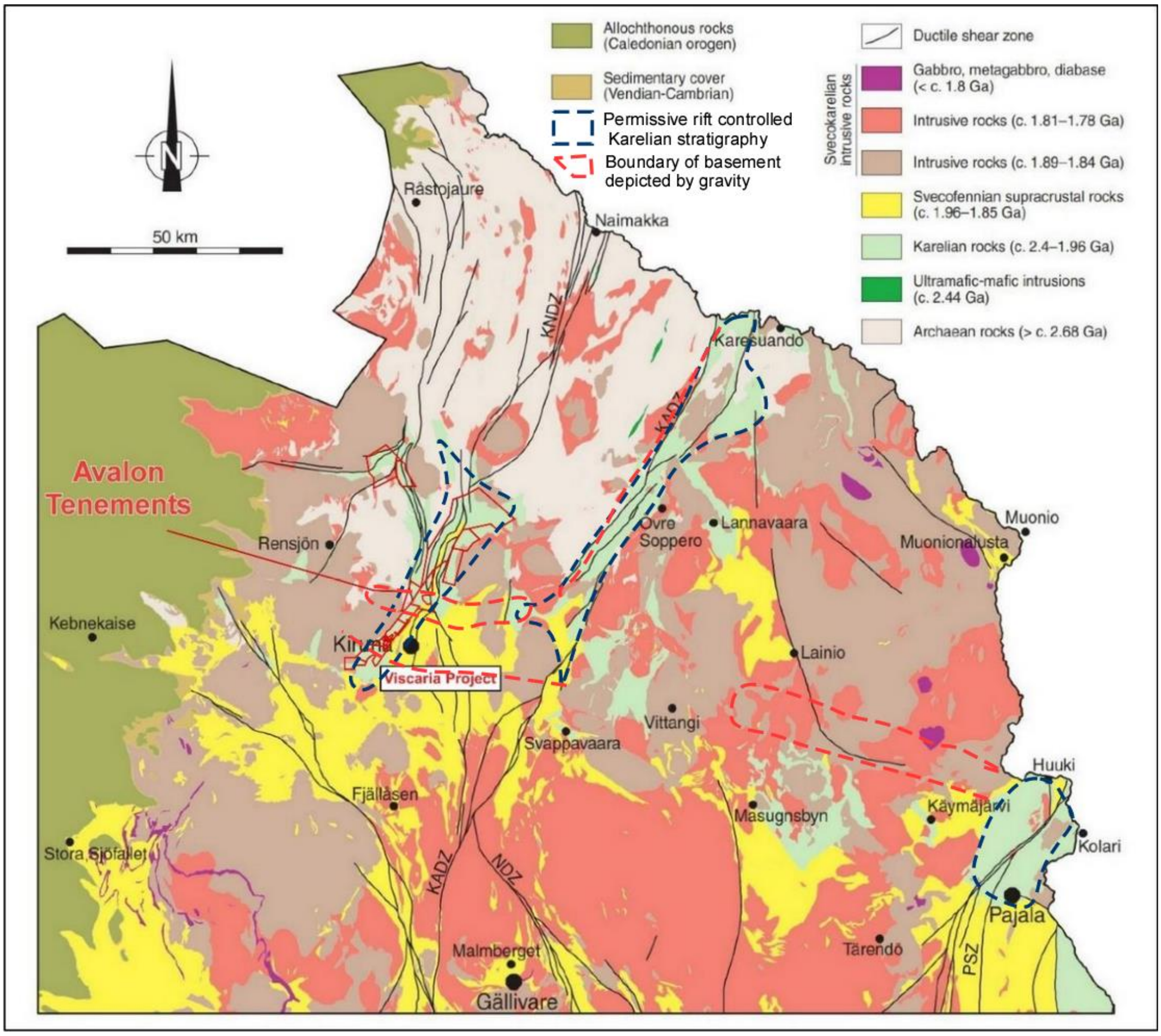


Figure 5.1. Regional geological map of the Norbotten region. Note the orthogonal and parallel relationship of inferred basement structures against preserved Karelian belts.

Tectonically, around 2.0 Ga there was a shift from extensional rifting and syn-volcanic hydrothermal activity into a compressional event called the Svecokarelian Orogeny (1.96 Ga to 1.75 Ga). This event is known to have produced the inversion of this part of the basin reactivating early extensional structures into steep reverse faults and associated folding Fig 5.2.

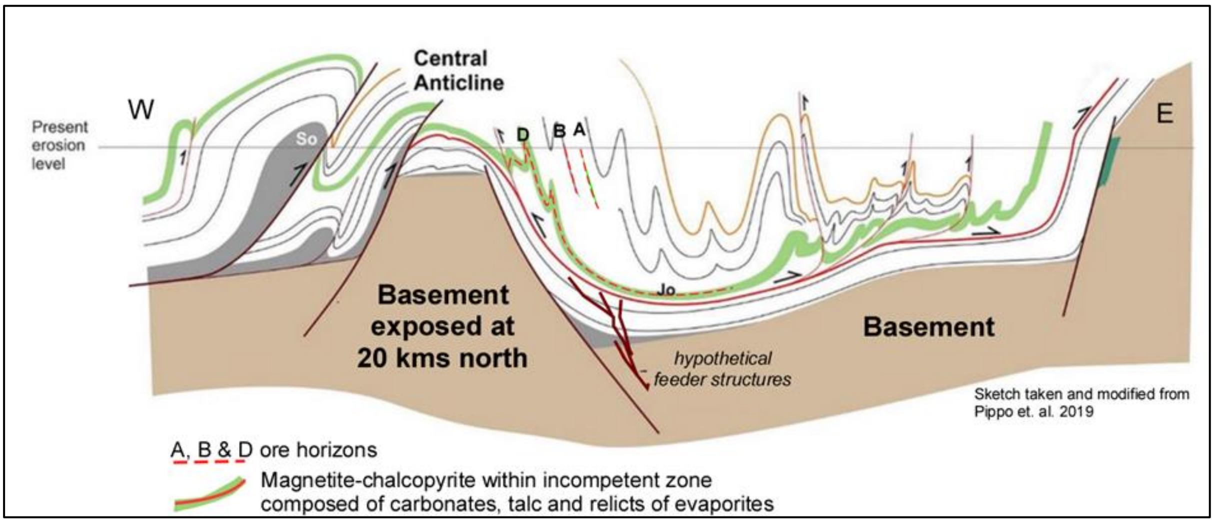


Figure 5.2. Schematic representation of deformation style recognized in the Finnish part of comparable Paleoproterozoic greenstone mafic sedimentary sequences overlying the Archean basement. A, B and D Viscaria ore horizons are tentatively marked in this adapted sketch as to enhance the role of basement structures in the Viscaria area.

There is some evidence that epigenetic deposits, faults and fractures zones were formed during this period, affected by several deformation events (Bergman et al. 2001). The Kiruna area is characterised by a low degree of metamorphism (generally upper greenschist to lower amphibolite facies) with well-preserved primary structures (Bergman et al. 2001). The Kiruna Greenstone Group has been divided into six formations based on petrographic and geochemical criteria (Martinsson, 1997). The formations, in stratigraphic order are: the Såkevaratjah Formation at the base of the Kiruna Greenstone Group, comprising of basaltic lavas, dolerite and locally conglomerates; the Ädnamvare Formation comprising of komatiites, indicating a change from tholeiitic to ultramafic magmatism; the Pikse Formation consisting of subaerial tholeiitic basalts; the Viscaria Formation, comprising a succession of volcanoclastic, chemical and organic sediments (carbon-rich shales); the Peuravaara Formation, consisting of MORB type submarine pillow-lavas; and the Linkaluopal Formation, consisting of volcanoclastics and carbonates.

Regional extensive albitization, dolomitic marbles and talc zones overlie the tholeiitic volcanic units and might represent dissolution relicts of inferred evaporite horizons within the well understood stratigraphy. Several of the ore hosting units can be easily traced along 20km length of the belt, without showing signs of high strain deformation, significant shortening or important thickness variations.

During early Proterozoic rifting of the Archaean basement, a north to northeast trending rift architecture localised preservation of the Karelian Suite (Fig. 5.3). These rift faults in conjunction with extensive mafic magmatism within shallow, but deepening, restricted basins were important for the formation of the stratiform Viscaria copper deposits during deposition of the Kiruna Greenstone Group. Recent revision of regional gravity data shows a series of parallel lineaments that are interpreted to represent the architecture of a concealed Archean basement. Such deep structures are depicted to be parallel and oblique to the shallow greenstone trends and are important elements for focusing fluid flow migration and deformation and therefore controlling the location of mineral deposits in the overlaying greenstones.

Subsequently during the Svecofennian Orogeny, these major brittle rift faults were reactivated and inverted bringing along any previously formed synvolcanic mineralization formed near extensional structures and forming major conduits for orogenic fluid flow and epigenetic styles of mineralization (e.g. Iron -oxide copper deposits).

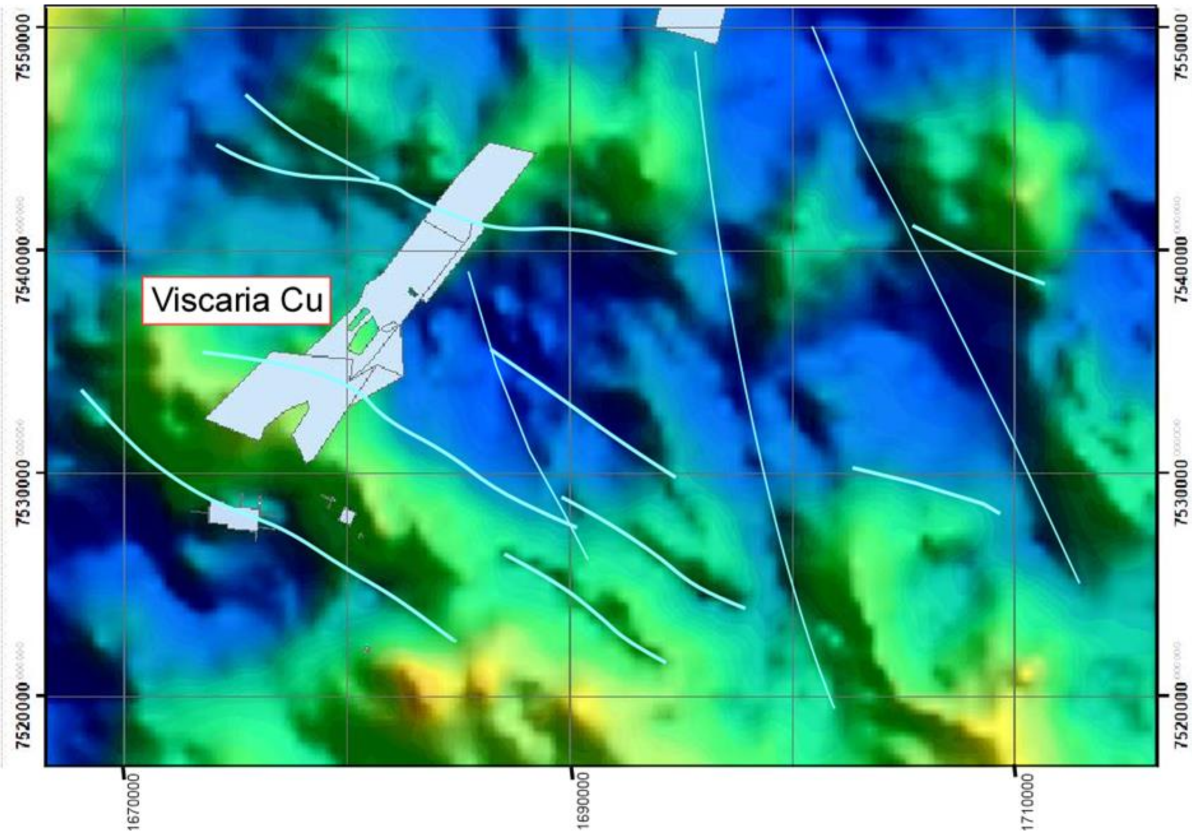


Figure 5.3. Regional scales low resolution gravimetric map with lineaments along areas of sharp gravity contrasts. This image intends to provide preliminary structural interpretation of the Archean basement underlying the Viscaria greenstones and younger supracrustal rocks. Negative gravity anomalies (blue) represent concealed Archean horst or dome that extends in a NW-SE fashion. The Viscaria deposit sits on top and near one of these structures and extends along orthogonally oriented structures to the main rift.

5.2 MINERALIZATION TYPE

- Several styles of mineralisation are recognised within the Kiruna mineral district. These regional mineralisation styles include Kiruna apatite-iron ore deposits of magmatic origin, Besshi-type volcanogenic massive sulphide deposits (VMS), Pahtohavare orogenic Cu deposits and potential iron-oxide-copper (IOC) type deposits.
- The Viscaria area contains evidence that suggest Cu mineralization was controlled by syn-volcanic hydrothermal activity spatially linked along basement structures. Subsequent deformation has imprinted local remobilization of ductile components of the system along mechanically brittle and coherent lithologies.
- The key aspects of the deposit include:
- Spatial association with interpreted basement boundaries of the concealed Archean basement
- Deposits are Cu-rich with a minimum content of Fe-sulphides and deleterious elements
- Hosted by turbidites, and contained within a broad tholeiitic mafic sequence of lavas and syn-sedimentary sills
- Cu mineralization extends for several kilometers along permeable and chemically reactive sedimentary units.

- Predominant presence of carbonates and Mg-rich alteration and indications of evaporite involvement
- Redox fronts and redox conditions are envisaged within several parts of the stratigraphy.
- Given the poor sulphur activity in the system and the suggested involvement of dissolved evaporites it is plausible that Cu sulphide precipitation proceeded as Cu bearing brines travelled along stratigraphic traps containing sour gas or primary syngenetic Fe-suphides which might have acted as important sources of reduced sulphur.
- Broad stratigraphic zonation occurs between the different ore lenses, Martinsson, 1997 proposed a red sea type of environment as a plausible VMS type of scenario for the Viscaria deposits. If syn-volcanic hydrothermal activity is considered, the nature of the alteration products, high salinity fluids (brines), and the in-situ as well as possible mobile reductants could explain the ample Cu distribution along specific permeable horizons.
- No feeder zones for the mineralization have been found yet. Oliver, 2017 identified several demagnetized areas occurring within the footwall volcanic stratigraphy of the ore lenses. It remains to be investigated whether such areas represent an alteration connected with hydrothermal VMS upflow zones or unrelated lithologies.

6.0 PROJECT HISTORY

6.1 TENURE HISTORY

The Viscaria Copper Project deposit was discovered in 1972 by LKAB after initial exploration, led by geologist Paul Forsell, was undertaken in an area where the Viscaria Alpina flower was growing. Viscaria Alpina can flourish despite high concentrations of copper in the soil. Copper mineralisation was first confirmed by drilling completed in 1973 (Martinsson, 1997).

First test mining was undertaken in 1979 and the board of LKAB made a decision to mine in 1980 when construction and mine preparation commenced. LKAB registered the company Viscaria AB in 1982 and the first delivery of ore was made to the plant in that year. LKAB operated the mine until 1986 when it was sold to Outokumpu Oy. Outokumpu operated Viscaria until closure in April 1997. The mine closed due to depleting ore reserves, falling head grades and low copper prices.

Detailed records of property ownership and tenure are unknown from 1997 to 2003. In late 1997 the area of Viscaria, including the old mine site and surrounding exploration areas were held by a Canadian company Daler Mining Corporation, which was then acquired by Vancouver Stock Exchange listed Brandon Gold Corporation in November 1997. Brandon Gold then changed its name to Redmond Ventures Corporation in September 1999. Both the Daler and Brandon companies held significant areas covering Viscaria and extending approximately 10 km south to the Pahtohavare copper deposit and 30 km north covering other targets. Phelps Dodge Exploration Sweden AB acquired the project in 2003.

Avalon Minerals Limited acquired the Viscaria Project from Phelps Dodge Exploration Sweden AB (at the time a subsidiary of Freeport-McMoran Exploration Corporation) in March 2008. It is assumed that the sale was initiated after the acquisition of Phelps Dodge by Freeport and divestment of smaller operations and projects.

Avalon acquired three approved exploration permits Viscaria nr 101, 102 and 103, and two applications Viscaria nr 1 and 2, upon acquisition of the project from Phelps Dodge. Immediately after acquisition Avalon applied for and had approved three additional exploration permits, Viscaria nr 104, 105, 106. One of these, Viscaria nr 104 was applied for to cover the old Viscaria tailings dam to undertake some assessment work to test the potential for reprocessing of tailings from the old mine. Avalon went on to acquire a series of exploration permits that covered the regional belt of rocks considered prospective for copper and iron mineralisation.

In April 2010, Avalon applied for three exploitation concessions, Viscaria K nr 3, 4 and 7 covering the main mineralised areas of the A Zone, B Zone and D Zone. Two of these, Viscaria K Nr 3 and 4, were declared approved on 21st February 2012 (valid from 16th January 2012, until 16th January 2037). The D Zone mineralisation is covered by Viscaria K nr 4.

In March 2019, Copperstone Resources AB acquisted Viscaria project from Sunstone. Exploration, studies related to mine opening and permitting is done by Avalon Minerals Viscaria AB which subsidiary fully owned by Copperstone Resources. Viscaria Project portfolio is managed by the Copperstone.

6.2 EXPLORATION

Exploration and regional data acquisition programmes conducted on the Viscaria Copper Project area and surrounding region prior to Copperstones tenure, involved a combination of company and government sponsored drilling programmes, regional mapping, magnetic surveys and surface geochemical surveys. The following sections provide a summary of historical data acquisition programmes.

6.2.1 GEOLOGICAL MAPPING

Regional geological mapping over the northern part of Norrbotten province that overlies the Viscaria project was conducted by the Swedish Geological Survey (SGU) at 1:50,000 scale with bedrock maps published in 1967-1983 and 1995-1999. In 1987, the existing geological compilation maps of northern Fennoscandia were published at 1:1 million scale (Silvennoinen et al., 1987). Subsequently that regional map and new interpretations were used by the SGU to generate a digital map at 1:250,000 scale in the late 1980s commissioned by the State Mining Property Commission (NSG).

The 1:250,000 scale digital map was the basis for a new mapping project conducted by the SGU that commenced in 1994. The aim of this most recent project was to compile existing regional information, complement it with new field data and analyses, and to generate updated databases and interpretations of the regional project map area. The results of this mapping project were presented in five printed maps, all of which are available at the SGU:

1. Bedrock map.
2. Mineral and bedrock resource map.
3. Metamorphic, structural and isotope age map.
4. Magnetic total field map. 5. Sheet containing four smaller maps:
    a. Gamma radiation map
    b. Electromagnetic map
    c. Topographic relief map
    d. Bouguer anomaly map.

The regional geological report that also covers the Viscaria Copper Project area is by Bergman et al. (2001).

6.2.2 DRILLING

Eight different drilling campaigns have been completed prior to Copperstone Resources acquisition of the Viscaria Project. Total of 234 have been completed with totalng 39 227 metres of drilling.

Figure 6.1 shows locations of all drillholes drilled to the Viscaria project and table x.x summarizes drilling campaigns completed for D zone.

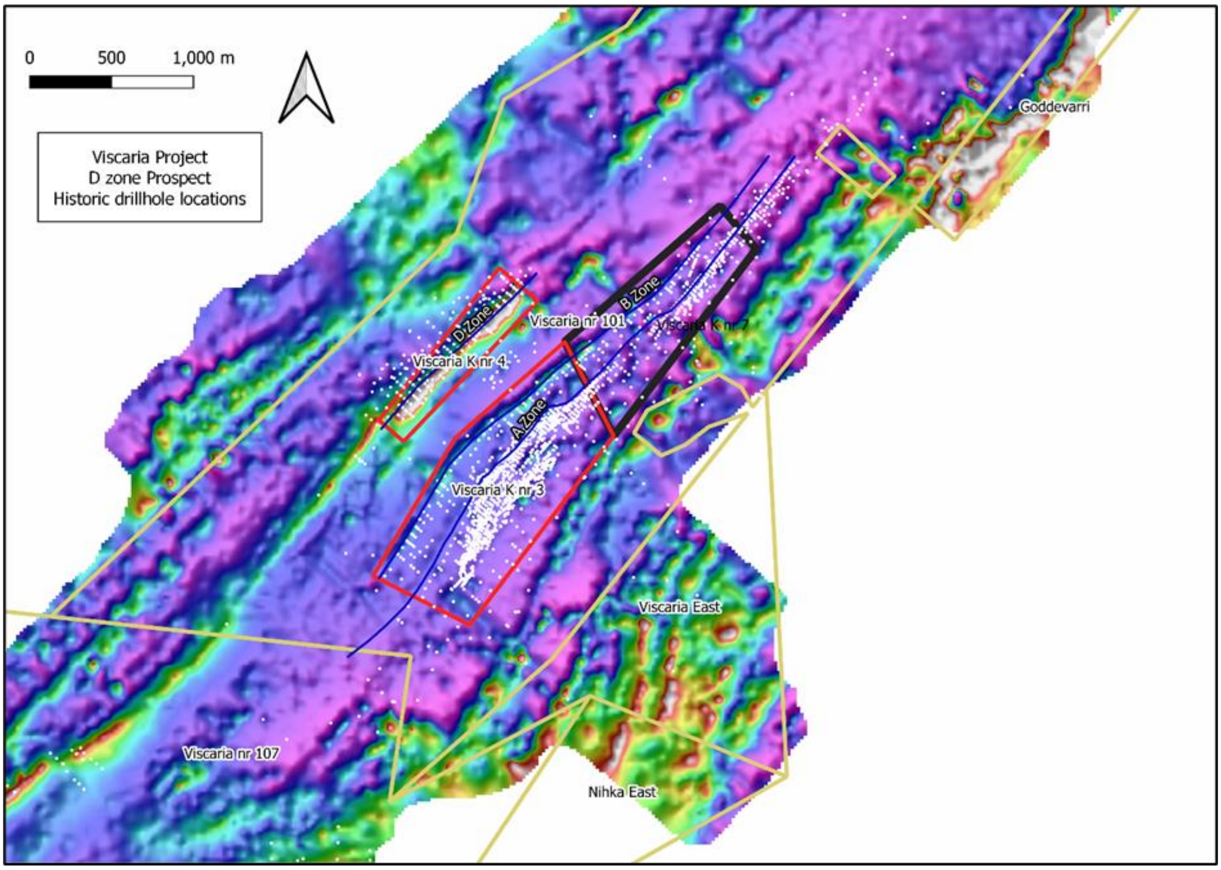


Figure 6.1 Location of historical drilling

Table 6.1 Summary of Historical Drilling (D Zone)

Campaigns	Company	Drill Hole Series	No. of Holes	Meterage
1. 1975 – 1986	LKAB	D-2659 to D-2660 D-2776 D-3006 to D-3007 D-3056 D-3076 D-3087 D-3159 D-3234 to D-3238 D-4768 D-5102 D-6039 to D-6041 D-6043	20	3,209.6
2. 1986 – 1997	Outokumpu	D-6892 to D-6900 D-7100 to D-7101 D-8374	12	1,045.9
3. Jan 2010 – May 2010	Avalon	VDD0012 to VDD 0064 VMD0001 to VMD0004 VWH0003 to VWH0004 VWH0007	61	5,661.2
4. Nov 2010 – April 2011	Avalon	VDD0068 to VDD0123 VPP0025 VPP0027 to VPP0028 VPP0062 VPP0091 VPP0120 to VPP0123 VPP0135 VPP0146 to VPP0147 VPP0150 VPP0152 VPP0154 VPP0158 VRC0019 VRC0032 to VRC0037	79	8,941.8
5. April 2012 – June 2012	Avalon	VDD0128 to VDD0129	2	598.4
6. Nov 2012 – April 2013	Avalon	VDD0130 VDD0132 to VDD0134 VDD0136 to VDD0142 VDD0144 to VDD0147 VDD0149 to VDD0153 VDD0155 to VDD0175 VDD0177 to VDD0179	44	12,447.7
7. Sept 2014 – Dec 2014	Avalon	VDD0180 to VDD0181	2	187.3
8. Mar 2015 – Nov 2015	Avalon	VDD0183 to VDD0196	14	7,135.2
			234	39,227.2

6.2.3 HISTORICAL RESOURCE ESTIMATES

The following table (Table 6.2) below lists the Mineral Resource estimates published by Viscaria Project over the last 12 Years for the Viscaria Copper Project.

Table 6.2 Historical Mineral Resource Estimates

Date	Zones	Notes
30-May-08	B Zone and D Zone	Maiden Mineral resource Estimate released by Avalon Minerals
12-Aug-08	A Zone North	
25-Sep-08	A Zone South	
Apr-10	A Zone, B Zone	Increased mineral resource estimates included in tables in ASX announcements
1-Oct-10	A Zone, B Zone, D Zone and Tailings Dam	
29-Nov-11	D Zone	
2-Oct-12	D Zone	Copper and Iron reported separately
4-Apr-13	D Zone	
26-Jun-13	D Zone	
22-May-14	D Zone	Reclassification to The JORC 2012 guidelines
1-Jul-14	A Zone, B Zone	Reclassification to The JORC 2012 guidelines
31-Oct-15	D zone	

The maiden Mineral Resource estimate for Viscaria under Avalon's ownership was released (under JORC, 2004) in May 2008 and comprised a B Zone Inferred Mineral Resource estimate of 24.1 Mt at 0.8% Cu and a D Zone Inferred Mineral Resource Estimate of 2.5 Mt at 1.6% Cu.

Subsequent Mineral Resource estimates were completed for A Zone and updates for B Zone later in 2008.

In 2010, a maiden Mineral Resource estimate was released for copper and iron for D Zone of 9.0 Mt at 0.55% Cu and 27% Fe. In the same ASX release a Resource Estimate for the historical Outokumpu Tailings Dam was included of 12.5 Mt at 0.27% Cu and 0.22% Zn. The Tailings Dam Mineral Resource Estimate was subsequently removed from any resource tabulation due to poor metallurgical recovery results.

In May 2014, the Mineral Resource estimate for D Zone was upgraded to comply with JORC, 2012 as well as the Mineral Resource estimates for A Zone and B Zone in July, 2014.

In November 2015, the Mineral Resource estimate was completed for D zone. Total mineral resource inventory was 11.14 Mt @ 1.23% Cu containing 137.2 kt copper metal.

6.2.4 PRODUCTION

Production from the Viscaria Mine commenced from development on A Zone in 1982. Over the life of mine between 1982 and 1997, approximately 12.54 Mt at 2.29% Cu ore was mined. Copper ore was extracted by underground mining techniques and processed at surface by conventional crushing, milling and froth flotation processes to produce smelter grade copper concentrates.

Initially, under the management of LKAB, the mine employed large scale mining methods of raise mining and sub-level open stoping (Makinen and Paganus, 1987). Stopes were 55 m high and 55 m wide. Mining methods changed once the operation was acquired by Outokumpu.

The concentrator throughput peaked in 1986 at 1.3 Mtpa of ore containing 2.3% Cu (diluted grade), this produced 105,000 tonnes of concentrate grading 24.7% Cu at a recovery of 89%. Copper recovery and concentrate grades improved during later years as concentrate production declined. Copper concentrates were produced and sold to Swedish and Finnish smelters (Hills and Wallace, 2013).

The production rate was initially in the order of 1.2 Mtpa and decreased over time to around 600 ktpa as the mine increased in depth and the central and northern mining blocks in A Zone were exhausted. Until 1997, approximately 11.5 Mt of ore was mined from the southern, northern and central areas of A Zone, while only 75,000 tonnes of ore was mined from B Zone on one level. Ore from the Pahtohavare deposit was mined from 1990 to 1997 and transported to Viscaria for processing, when approximately 1.7 Mt of ore grading 1.9% Cu was processed through the Viscaria plant.

Access to the mine was by three declines. The main decline was situated between the central and northern mining areas, the second portal accessed the northern area and was connected to the main decline. The third decline was used to access the southern mining area and was not connected through to the other declines.

A number of mining methods were employed throughout the life of the mine. Initially the main method was a non-entry form of Alimak stoping. This was supplemented in more complex or flatter ore zones by ramp cut-and-fill stoping. Later mining was primarily conventional longhole methods. The majority of stoping in the central mining area appears to have been by uphole sub-level open stoping. Mining was by three variants of sublevel stoping, where sub-level intervals were adjusted according to dip, thickness and ground conditions (Sletten, 2012). Near vertical parts of the deposit were efficiently exploited by 30 m longholes both upward and downward. When the dip flattened closer spaced drifts and sub-level intervals were required.

The workings were allowed to flood and the portals closed, when the operations were closed in 1997.

7.0 RECENT EXPLORATION AND DATA ACQUISITION

The following details pertain to activity on the Exploitation Licence area Viscaria K nr 4 which contains D Zone mineralisation.

7.1 GEOLOGICAL AND TOPOGRAPHIC MAPPING

Due to the presence of widespread glacial till deposits, small lakes, areas of bog and peat that occur over much of the Viscaria K nr 4 exploitation licence area, there is minimal outcrop and so no systematic surface geological mapping has been undertaken in the area containing the D Zone mineralisation to date.

The most detailed geological map that is available over the Viscaria K nr 4 licence area is a 1:250,000 scale SGU geological map.

No systematic ground based topographic surveying has been conducted over the area of the Viscaria K nr 4 licence. A topographic surface exists for D Zone mineralisation area, which was sourced from a regional LIDAR survey.

7.2 DRILLING AND OTHER SAMPLING METHODS

The only sampling methods that have been employed on or near the Viscaria K nr 4 licence area is drill hole sampling. Both diamond drilling and percussion drilling methods have been used to drill and sample the D Zone mineralisation. A total of 245 drill holes have been drilled to intersect the D Zone mineralisation, including 216 diamond drill holes and 29 percussion holes. There have been several campaigns of diamond drilling at the D Zone deposit as summarised in Table 7.1.

Table 7.1 Drilling Campaigns

Campaigns	Company	Drill Hole Series	No. of Holes	Meterage
1. 1975 – 1986	LKAB	D-2659 to D-2660	20	3,209.6
		D-2776		
		D-3006 to D-3007		
		D-3056		
		D-3076		
		D-3087		
		D-3159		
		D-3234 to D-3238		
		D-4768		
		D-5102		
		D-6039 to D-6041		
		D-6043		
2. 1986 – 1997	Outokumpu	D-6892 to D-6900	12	1,045.9
		D-7100 to D-7101		
		D-8374		
3. Jan 2010 – May 2010	Avalon	VDD0012 to VDD 0064	61	5,661.2
		VMD0001 to VMD0004		
		VWH0003 to VWH0004		
		VWH0007		
4. Nov 2010 – April 2011	Avalon	VDD0068 to VDD0123	79	8,941.8
		VPP0025		
		VPP0027 to VPP0028		
		VPP0062		
		VPP0091		
		VPP0120 to VPP0123		
		VPP0135		
		VPP0146 to VPP0147		
		VPP0150		
		VPP0152		
		VPP0154		
		VPP0158		
		VRC0019		
		VRC0032 to VRC0037		
5. April 2012 – June 2012	Avalon	VDD0128 to VDD0129	2	598.4
6. Nov 2012 – April 2013	Avalon	VDD0130	44	12,447.7
		VDD0132 to VDD0134		
		VDD0136 to VDD0142		
		VDD0144 to VDD0147		
		VDD0149 to VDD0153		
		VDD0155 to VDD0175		
		VDD0177 to VDD0179		
7. Sept 2014 – Dec 2014	Avalon	VDD0180 to VDD0181	2	187.3
8. Mar 2015 – Nov 2015	Avalon	VDD0183 to VDD0196	14	7,135.2
9. Nov 2019 – Apr 2020	Copperstone	VDD0205 to VDD0207	9	6,853.0
		VDD0210 to VDD215		
10. Oct 2019 – Nov 2020	Copperstone	VDD0239	2	1,175.0
		VDD0241		
			245	47,255.2

Prior to 2012 the drilling contractor was Styrud Arctic. Drilling Campaign 6 saw 44 drill holes completed between November 2012 and April 2013 by More Core Diamond Drilling Services Ltd.

Drilling Campaign (8) has utilised two drilling contractors, which have completed 14 drill holes Arctic Drilling Company completed drill holes VDD0180 to VDD0190 and Oy Kati AB completed drill holes VDD0191 to VDD0196.

Drilling Campaign (9) was completed by Kati oy. Current drilling campaign (10) is drilled by Arctic Drilling Company. Figure 7.1 show location of D zone drilling and figure 7.2 shows inclined 3D image of drillholes.

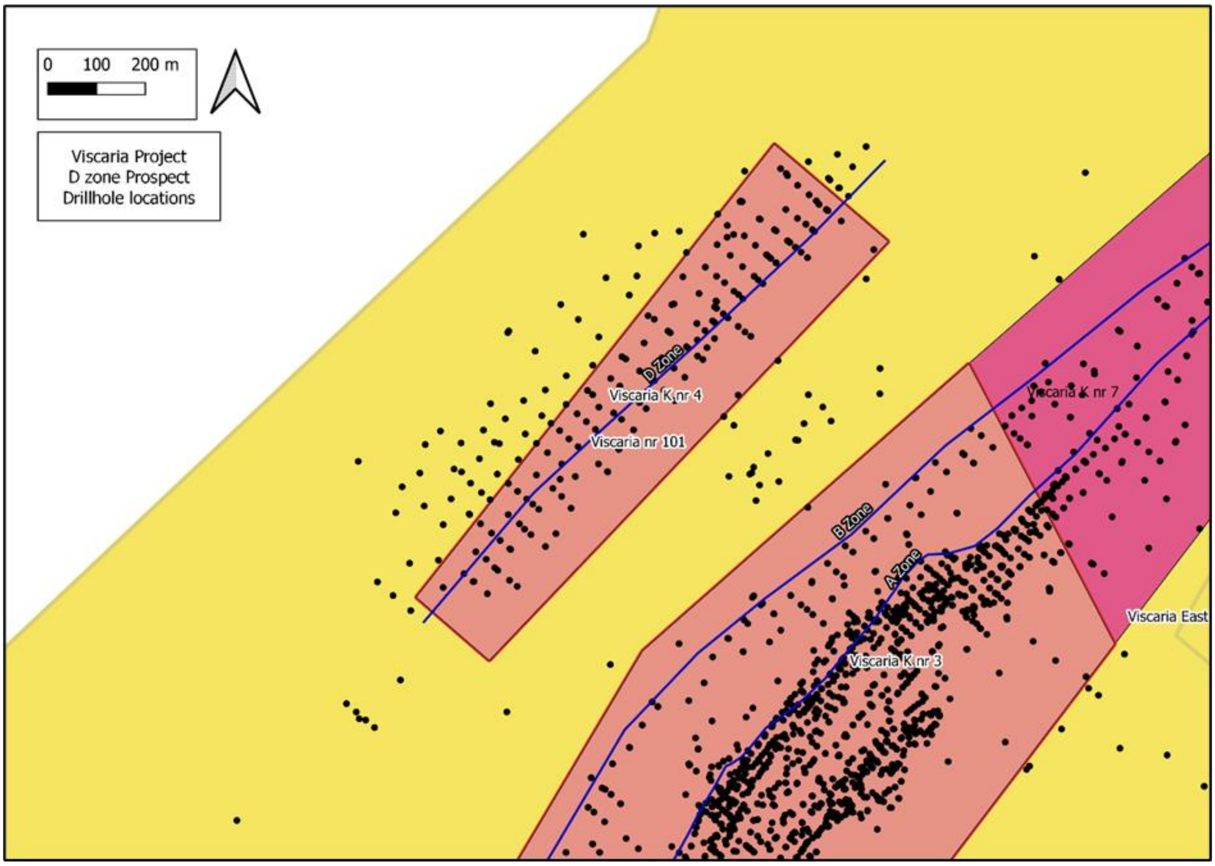


Figure 7.1 D Zone drill hole locations

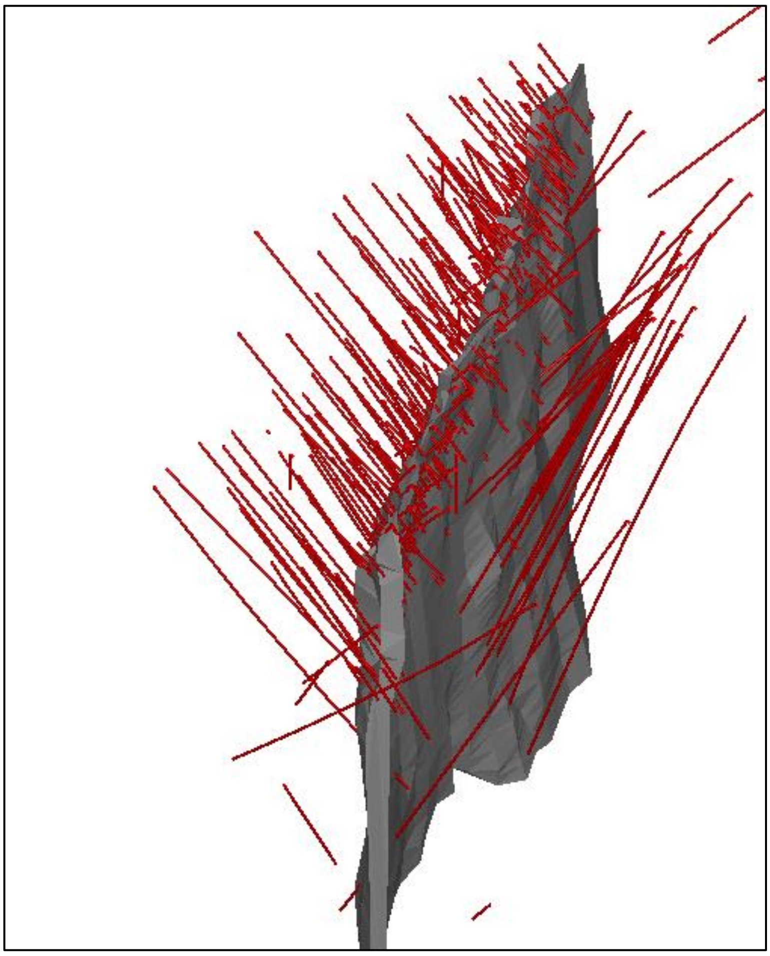


Figure 7.2 3D inclined perspective view looking north showing drill holes at D Zone and the mineralised magnetite skarn unit

7.3 DRILL CORE STORAGE

Most of the drill core drilled by LKAB and by Outokumpu is unavailable, however, sections of the following drill holes are stored at the Swedish Geological Survey facility at Malå – D-2776, D-3007, D-3087, D3235-D3236, D-4768, D-6040, D-6892, D-6894-D-6895 and D-6898.

All split (sampled intervals) and un-split diamond cores that were drilled by Avalon Minerals Ltd or Copperstone Resource AB are stored at Avalon's core shed and core storage facilities in Kiruna.

7.4 DRILLHOLE SAMPLE PREPARATION

Drill core from D Zone is processed at Avalon's core shed facility in Kiruna. The following shows the work flow for the processing of drill core, from sample receipt from the drilling contractor through to despatch to the sample preparation laboratory:

1. Core transported by drilling contractor to Avalon core shed and laid out on core racks. Rock Quality Designation ("RQD") and meter marking undertaken (logged into digital templates).
2. Bottom of hole line mark-up to enable orientation of core for structural logging.
3. Geology logging - Lithology, Alteration, Mineralisation (logged into digital template).
4. Selection of sampling intervals. Marking up of sampling intervals on core and enter sample intervals into digital sampling sheet. QA/QC samples are inserted in the sample list.
5. Structure logging (logged into digital template).

6. Geotech logging (logged into digital template).
7. Core photography. Core is photographed in both a dry and wet state in a custom-built camera housing.
8. Pallet boxes are shipped to the ALS sample preparation laboratory in Piteå, Norrbotten.

Coarse rejects currently exist for those cores sampled during the 2019-2020 drilling campaign and are currently being stored at the ALS sample preparation Laboratory in Piteå, Norrbotten. Most sample pulps from the various previous drilling campaigns are stored at Copperstone core storage facility in Kiruna.

7.4.1 GEOLOGICAL LOGGING

All available core is geologically logged for lithology, weathering, structure, mineralogy, mineralisation, colour and other features. Geological data from drill core and chip samples is logged into an acQuire compatible spreadsheets with validation rules to minimise transcription errors and to expedite the entry of data into digital form.

The logged intervals (From and To fields) are the actual geological intervals and not the sampling intervals, sample boundaries are subsequently determined based on mineralisation and lithological boundaries.

7.4.2 GEOTECHNICAL LOGGING

All available core is geotechnically logged for rock properties and/or characteristics, including Rock Quality Data (RQD), planar defect orientation measurements and characterisation. Geotechnical data from drill core is logged directly into an acQuire compatible spreadsheets with appropriate validation rules to minimise transcription errors, and to expedite the entry of data into digital form.

7.5 GEOPHYSICAL SURVEYS

Downhole EM test program was piloted in the D zone deeps. Three holes (VDD0215, VDD0213, VDD0207) from D zone deep north and one hole (VDD0206) from D zone deep south was measured using downhole electromagnetic methods. Standard downhole EM method with surface loop and on downhole receivers were applied and work was contracted to Geovista which is extensive experience of designing, surveying and interpreting downhole EM results. First indication of the results is promising and follow-up programs will be completed.

7.6 GEOCHEMISTRY

7.6.1 CORE SAMPLING

Intervals for sampling are selected by Copperstone geological during the logging of the drillcore. Nominal sample length is 1 metre and length are adjusted for geological boundaries with allowing 0.4m-1.4m sample lengths. Samples are not crossing any obvious geological contacts including lithological, structural, alteration and mineralisation contacts. Cutting lines for saw is drawn to the samples. Sampling information is entered to digital sampling acQuire compatible sampling sheet with relevant validation checks. After completion of digital sampling sheet sample numbers for sample tickets books are assigned to drillcore.

Completed drillcore is packed in the pallets and sent to ALS laboratories in Piteå, Norrbotten via courier service. Chain of custody is maintained from Copperstone premises to courier to ALS laboratories. ALS cuts samples to half core based on the digital sampling information and cross-checking against sample tickets. Half core is directly sent for sample preparation and second half is retained core archieves. Core boxes with half core is returned to Copperstone and stored in the core arhieves.

7.6.2 SAMPLE ANALYSIS

All Avalon drill core samples are analysed by ALS Minerals, a subdivision of ALS Global. Analyses are conducted at ALS laboratories outside of Sweden, with pulps being sent via ALS inter-lab transfer protocols.

The sample preparation procedure that has been utilised for the 2019-2020 drilling campaign at D Zone involves the following procedures conducted at ALS in Piteå:

- WEI-21: Received sample weight determined
- CRU-31: Fine crushing; 70% <2 mm
- SPL-21: Sample split with a riffle splitter
- PUL-31: Pulverise split to 85% <75 µm (weight 250 grams). Ring mill pulveriser.
- LOG-24: 85% <75 m; Log received sample pulp in tracking system.

Samples have been analysed using only three analytical techniques for copper for the entire suite of Copperstone drill cores (2019-202020). A series of other elements have also been routinely analysed.

Copper ME-ICP61

Digestion: HNO3-HClO4-HF-HCl digestion, HCl Leach (GEO 4ACID)

Analytical Method: Inductively Coupled Plasma - Atomic Emission Spectroscopy (ICP - AES)

A prepared sample (0.25 g) is digested with perchloric, nitric, hydrofluoric and hydrochloric acids. The residue is topped up with dilute hydrochloric acid and the resulting solution is analysed by inductively coupled plasma-atomic emission spectrometry. Results are corrected for spectral inter-element interferences.

NOTE: Four acid digestions are able to dissolve most minerals; however, although the term “near-total” is used, depending on the sample matrix, not all elements are quantitatively extracted. Iron is also analysed using near-total 4 acid digestion. This results iron assay results to be Total iron results which includes all the magnetite iron along with other iron bearing minerals such as sulphides, carbonates and silicates. Therefore analysed iron is not same than analysed magnetite iron.

Copper ME-ICP81 / ME-ICP81x

Digestion: Sodium Peroxide Fusion (FUS-PER04)

Analytical Method: Inductively Coupled Plasma - Atomic Emission Spectroscopy (ICP - AES)

A prepared sample (0.1 g) is fused with 1.0 g of sodium peroxide flux in a zirconium crucible at 700 °C. The resulting melt is cooled and dissolved in dilute hydrochloric acid. This solution is then analysed by inductively coupled plasma – atomic emission spectrometry and the results are corrected for spectral inter element interferences.

Copper CU-OG62 (for over-detection limit samples)

Digestion: HNO3-HClO4-HF-HCl Digestion (ASY-4A01)

Analytical Method: Inductively Coupled Plasma - Atomic Emission Spectroscopy (ICP - AES)

A prepared sample is digested with nitric, perchloric, hydrofluoric, and hydrochloric acids, and then evaporated to incipient dryness. Hydrochloric acid and de-ionized water is added for further digestion, and the sample is heated for an additional allotted time. The sample is cooled to room temperature and transferred to a volumetric flask (100 mL). The resulting solution is diluted to volume with de-ionized water, homogenized and the` solution is analysed by inductively coupled plasma - atomic emission spectroscopy or by atomic absorption spectrometry. Results are corrected for spectral inter-element interferences.

Detection Limits

ME-ICP61: The lower and upper detection limits for Cu are 0.0001% to 1%.

ME-ICP81(x): The lower and upper detection limits for Cu are 0.05% to 50%.

CU-OG62 : The lower and upper detection limits for Cu are 0.001% to 50%.

Additional Elements Routinely Analysed Elements analysed by ME-ICP61 include:

Ag, Al, As, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, K, La, Mg, Mn, Mo, Na, Ni, P, Pb, S, Sb, Sc, Sr, Th, Ti, Tl, U, V, W and Zn.

Elements analysed by ME-ICP81x include:

Al2O3, As, CaO, Co, Cr2O3, Cu, Fe2O3, K2O, MgO, MnO, Ni, Pb, S, SiO2, TiO2, Zn.

7.7 QA/QC

Coppestone quality assurance and quality control (QA/QC) procedure for the geochemical analyses of drill core involves the insertion of a series of certified reference materials (standards) and blank samples (blanks) as well as the submission of duplicate crush samples. The ALS laboratory also inserts their own sets of standards and blanks and analysis of periodic repeat assays.

Copperstone uses blank material which is provided by ALS laboratories. The blank is a coarse sand and it contains no metal anomalies nor safety hazards for the laboratory.

Copperstone uses several Certified Reference Material for different elements and different grade ranges. CRM is purchased from the international well-know CRM provider and it is certified according normal protocols. Operation is on-going and CRM are used FOR QAQC in the future assay batches. Therefore Competent Person has decided not to publish information which is used to monitor performance of the laboratories.

Industry best practises is followed throughout process which includes 1) QC (fail or accept individual batches) and QA (monitoring performance in the longer term).

7.8 DRILL HOLE SURVEY, HOLE POSITION AND SET-UP ANGLE

Drill holes are planned in the 3D modelling software package Geovia Surpac. Planned drillholes are marked onsite by company which is specialised to surveying. Drillhole locations are marked using DGPS for collar position. Two points for front of the drill site and two points for the back of the drill site are marked at 10m and 20m from collar point. All markings are done in cm accuracy which allow accurate drilling line to be defined.

Drillhole information sheet is deliver to drillers in the electric format. Sheet contains all required information about drillhole location, direction and instructions of drilling. Instructions of drilling includes safety aspects such as possible voids and structures which may be intersected and information of poor ground conditions to assist with core recoveries.

After drilling is completed drillhole collar positions are measured by surveyor. Collar surveys have been completed by a qualified and competent local contract surveying company. Eequipment is well maintained and regularly calibrated and checked for accuracy.

7.9 DOWNHOLE POSITION AND SURVEY METHOD

Downhole surveys are done by the drill contractors using a Reflex Gyro tool that measures the drill hole dip and azimuth. Downhole surveys are typically conducted at 6 metres in the bedrock and 100 m depth and then every 100 m thereafter, or as required. A full length end of drill hole survey is also taken.

After completion of the drilling collar location and drilling direction surveys are completed using company which is specialised on the surveying. Drilling direction is surveyed using DGPS as device and defined procedure for accurate measurement. Measurement is done from collar casing with assistance of measuring pipe. Final azimuth reading is entered to Reflex gyro tool and final downhole survey is adjusted for accurate start azimuth. Final downhole survey is deliver to database manager for database entry.

7.10 DATA MANAGEMENT, STORAGE AND SECURITY

Viscaria project maintain SQL based acQuire database for all the drillhole data. This includes collar, lithology, bulk density, magnetic susceptibility, geotechnical logging and assay data. Data is collected by Copperstone employees using acQuire compatible logging templates. Templates are designed to contain all main validation checks in the data collection phase, and they are connected to acQuire libraries to ensure compliant data collections. Main validation includes for example overlapping intervals, missing intervals, and validation of used logging codes. Collected data is stored&archieve in the data server and delivered to database manager for uploading to database. AcQuire database has additional validation checks while importing and accepting data to database. Database also maintains digital audit trails containing timestamps for uploading the data, editing the data and persons involved in the database uploading&editing. Each of the collected record also contains date and initials of data collector as digital signoff. Database security has been setup to allow edit&insert permission rights only for database manager. AcQuire database in backed up daily. Competent person opinion is that collected data is recorded at high quality and digital audit trail is maintained and data is fully secured.

Drilling information from August 2019-May 2020 was collected using excel templates and stored in the excel spreadsheets. Data collection method has not allowed maintaining full audit trail. However, data has been uploaded to acQuire database through normal validation protocols and information is fully validated. Data is accepted as high-quality data.

Avalon Minerals Viscaria AB used acQuire database system for drilling and collecting information from 2009-2018 with similar validation procedures that are in place now. This data is well maintained and validated, and competent person has accepted the data as high-quality data.

8.0 DEPOSIT GEOLOGY

8.1 LOCAL GEOLOGY

The Viscaria Formation hosts three distinct zones of stratiform to stratabound mineralisation that are referred to as D Zone, B Zone and A Zone (in lowest to highest stratigraphic order; (Figs. 8.1 & 8.2). These zones of mineralisation are laterally extensive and steeply dipping to the South East. The A Zone mineralised horizon can be traced for over 3.8 km along strike towards the northeast and southwest. Mineralisation along the B Zone horizon lies in the footwall to the A Zone horizon and has been intersected over a 2.9 km strike length. Mineralisation along the D Zone horizon has been encountered at deeper stratigraphic levels along a 1.2 km long strike length. The D Zone mineralisation, which is the subject of this resource report, broadly lies within the lowermost part of the Viscaria Formation which is defined by a strongly magnetite-replaced Ca-Mg-carbonate stratigraphic unit that lies immediately above the Pikse Formation, a subaerial basalt. The hanging wall to the D ore lens comprises talc, tremolite and chlorite altered tuffaceous sediments interbedded with cherty and graphitic siltstones that comprise the lower part of the Viscaria Formation.

The B Zone mineralisation is hosted by four members. The basal B1 member consists of a massive, fine-grained tuff. The overlying B2 member is similar in composition but has graded bedding structures of varying scale. The higher B3 member is tuffitic with interbedded graphitic schist. The uppermost B4 member is composed of coarse-grained pyroclastic material. The host rock of the A Zone mineralisation varies in thickness from 15 m to 25 m and is composed of a mixture of felsic ash tuff, black/graphitic schist, carbonate and basaltic tuff. The basal felsic tuff unit is typically 3 m to 5 m thick. Disseminated graphite occurs at the base of the unit. The graphite content gradually increases upwards and grades into a black/graphitic schist. An ore-bearing carbonate unit has historically been interpreted to be hosted in a layered sedimentary tuff unit that separates the underlying graphitic schist from overlying pyroclastic and sedimentary units. Overlying the Viscaria Formation is the Peuravaara Formation, a thick sequence of submarine pillow lavas that contain several horizons of Fe-rich chemical sediments. The middle and upper parts of the Viscaria Formation, between the D Zone horizon and the A Zone horizon, has been intruded by several mafic sills (Fig.8.1). The sills range in thickness from 10 m to 50 m (Martinsson, 1997).

Several of the coarser tuffaceous horizons are preferentially replaced and bleached by pervasive carbonatization. These horizons show different degree of Cu and magnetite mineralization. The highest content of carbonates is observed in the D Zone horizon.

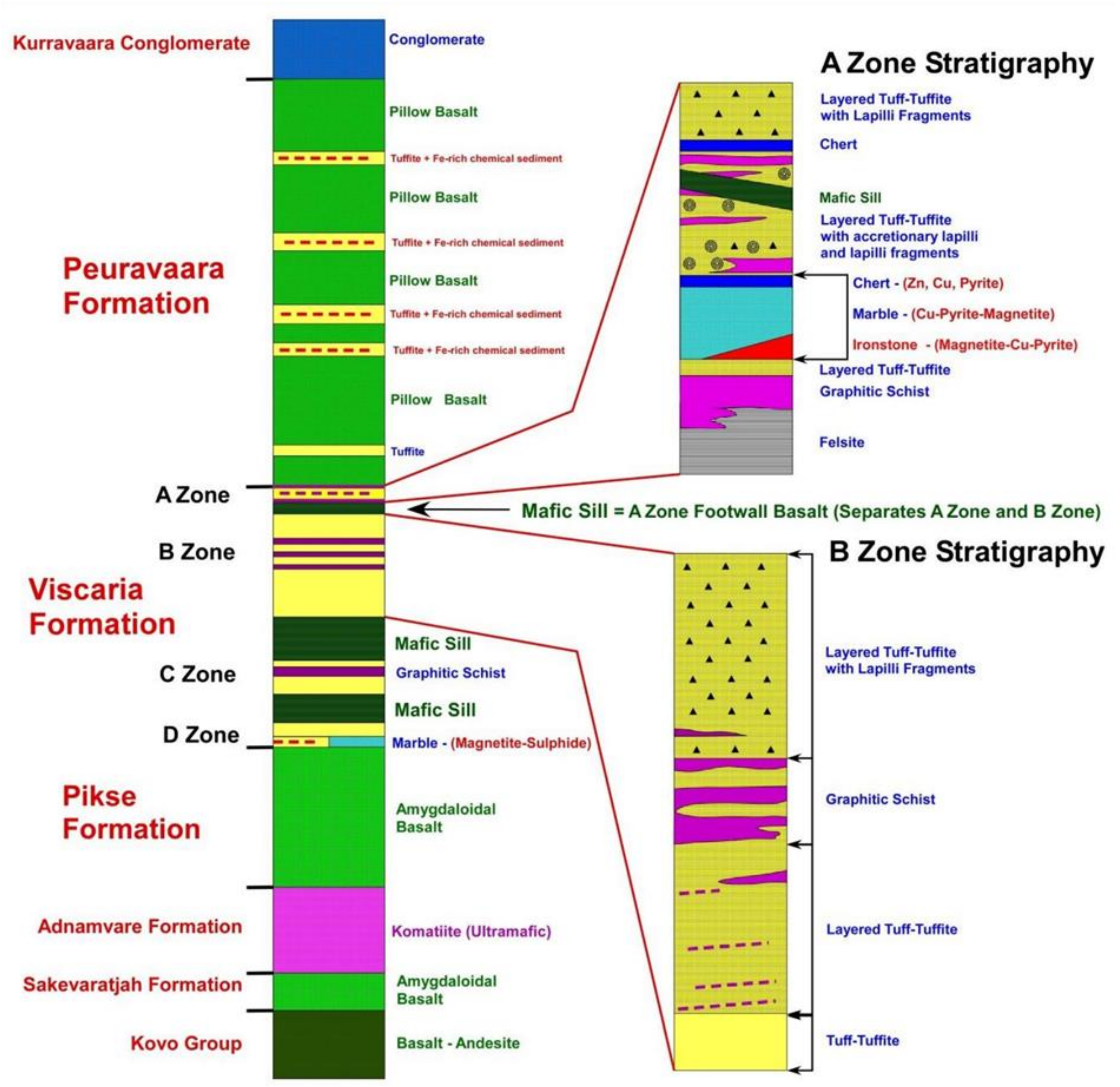


Figure 8.1. Detailed stratigraphic column for the Viscaria area. A, B and D ore horizons are hosted within the sedimentary rich part of the sequence.

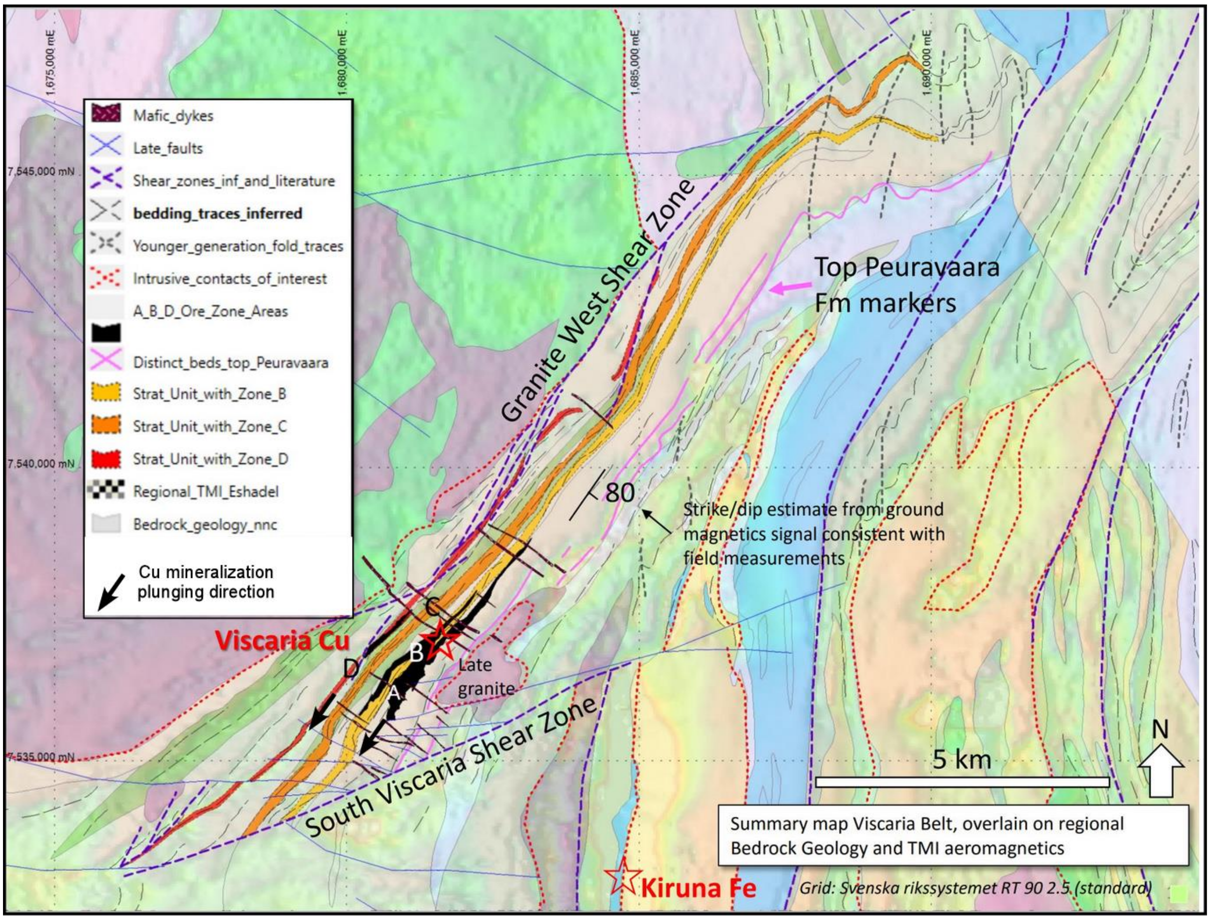


Figure 8.2. The South Viscaria shear zone controls the south extension of the ore hosting lithologies. Drilling intersections and structural interpretations Pratt, 2020 for extension of the D ore lenses at depth indicates partly an structural control on the steeply dipping plunge of higher Cu grades and increased mineralized thickness towards the South West.

8.2 MINERALOGY AND ALTERATION

The A Zone and B Zone deposits are not part of this resource estimate; however, they are considered to be part of the same protracted mineralising system. The sulphide assemblage in these deposits is predominantly chalcopyrite ± magnetite ± sphalerite ± galena and in the upper most horizons where ores are strongly associated with graphitic schists a notorious increase in pyrrhotite and pyrite is evident. Copper sulphide mineralisation is commonly stratiform in nature, consistent with an exhalative origin for the A Zone and B Zone deposits.

Metasomatic changes associated with geochemical alteration haloes mapped by Martinsson, 1997 involved significant changes in Ba, Na, K, and Zn. The alteration zones around the D orebody contains notable occurrence of actinolite, talc and tremolite, diopside and locally K-feldspar.

The conspicuous features related with the D orebody are:

- Elevated content of Fe oxides (26-30% of magnetite) with exclusively content of Cu sulphides (chalcopyrite) replacing magnetite and a marble unit.
- Hosted by a marble unit located within the lowermost mineralized package of the Viscaria Formation, overlying a carbonate breccia zone that extends with uniform thickness parallel to the deformation zone along the basalt footwall contact.
- Chalcopyrite is preferentially precipitated in magnetite zones (Fig.8.5) with stronger mineralization near their contacts.

- Negligible contents of Fe and Zn sulphides. Peripheral or marginal zones contain slightly presence of pyrite replacement on magnetite.

- Redox boundaries hematite - magnetite are observed at the footwall contact zones of the Cu mineralization. Cu sulphides sit exclusively on the magnetite side and strongly replace their contacts.

A representative example of a cross section for the D zone is difficult to depict; as tectonic deformation involves thickening, pinching and intraformational folding within the mechanically incompetent marble unit. A schematic section across the D zone is given by Pratt, 2020 (Fig. 8.3) and an example of a detailed cross section with current lithological codes is given in Fig.8.4

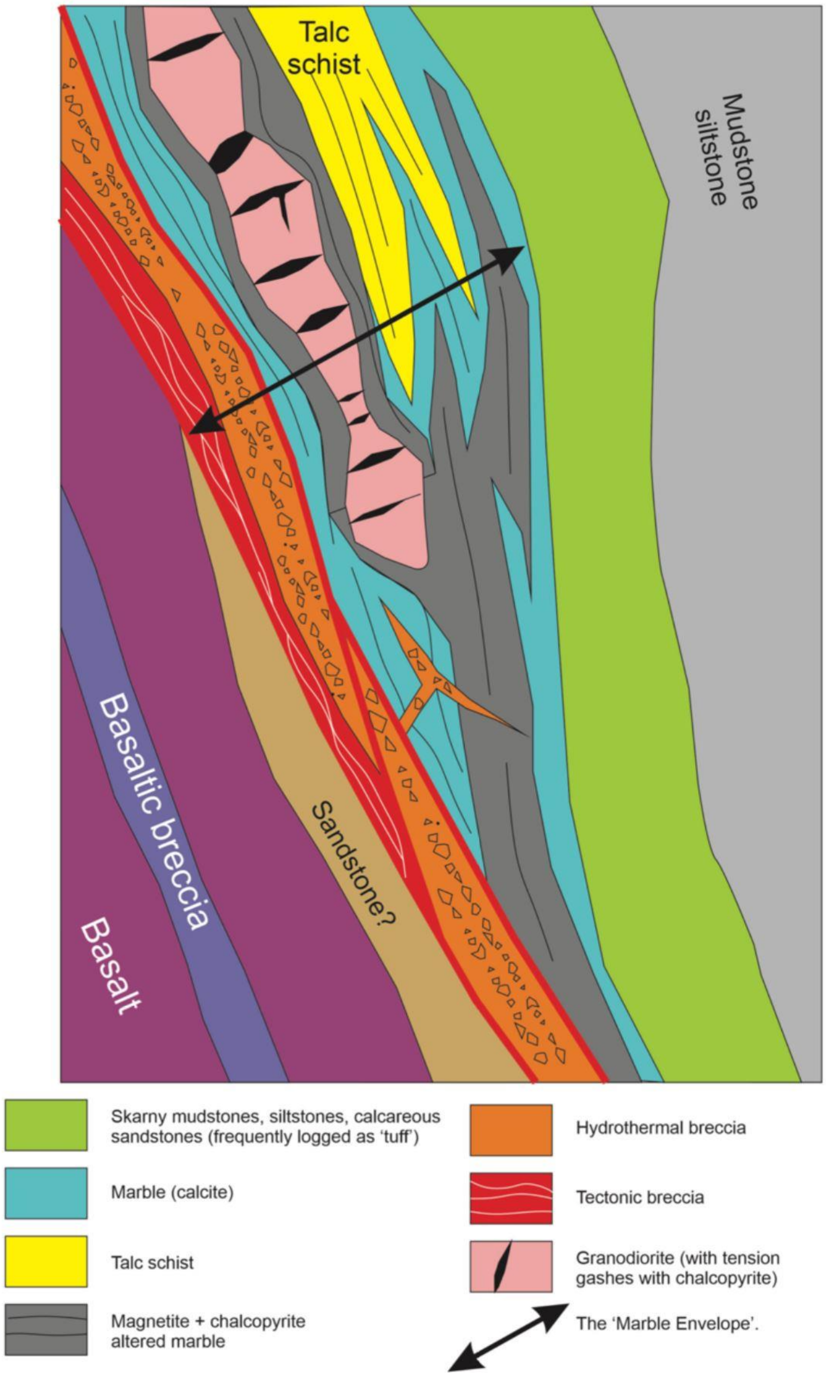


Figure 8.3. Schematic west to East section on the D lens. By Pratt, 2020. Note also the Cu-rich vein style of mineralization emplaced in tension gashes within competent units (Fig.8.6)

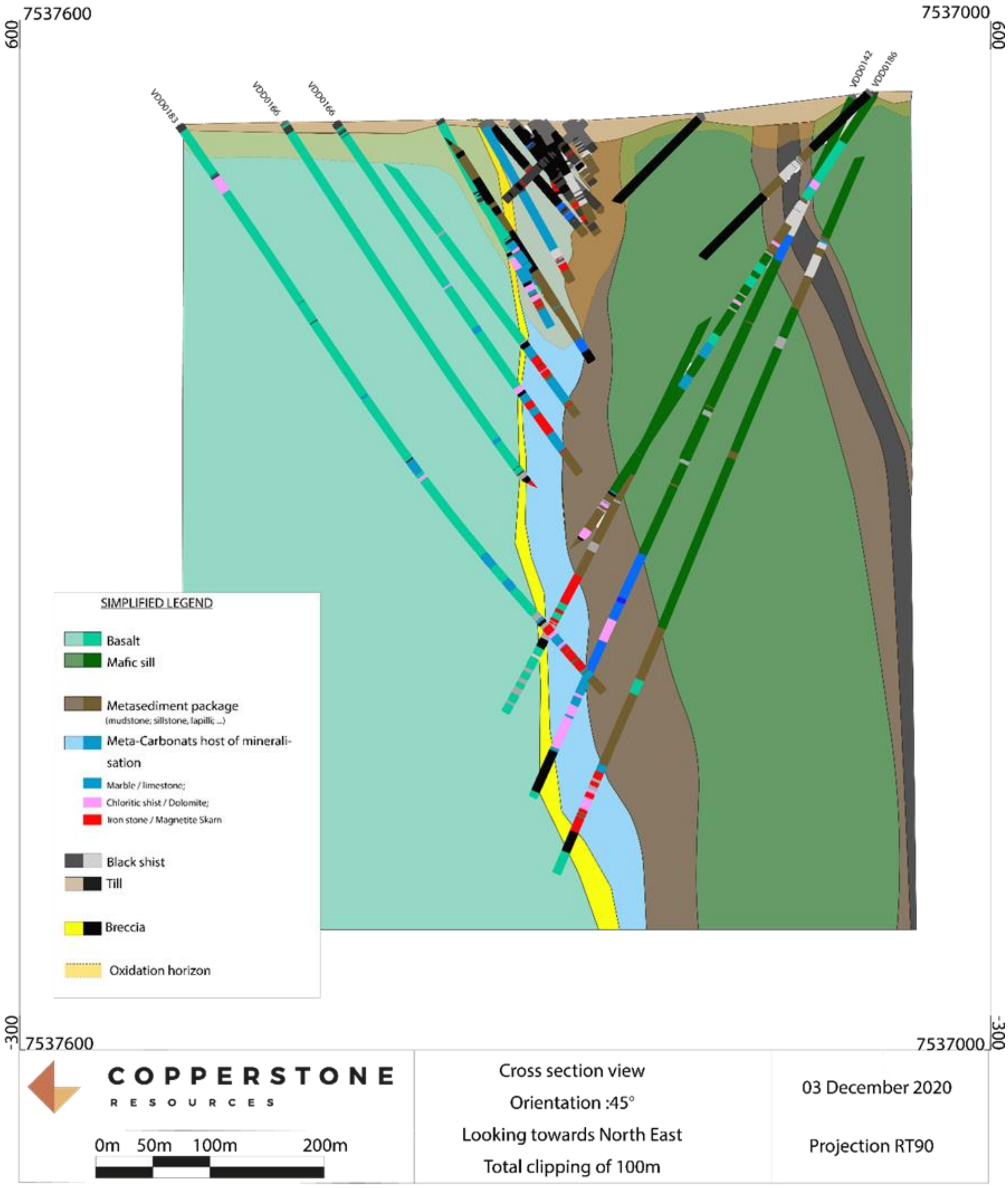


Figure 8.4. Detailed cross section across the D zone.

8.3 EXPLORATION OF THE D ZONE

Deeper exploration and infill drilling are confirming asymmetric distribution of the ore thickness towards the south. This asymmetric aspect is accompanied by increased Cu grades towards areas of greater thickness and might imply proximity to hard structural boundaries or feeder corridors, not previously recognized near surface.

Borehole electromagnetic exploration of the relatively poorly-moderately conductive Cu mineralization has been attempted but not done fully due to blockage on important parts of the boreholes. However, geophysical interpretation remarks the presence of a South West oriented subtle conductors that can be confidently distinguished from formational graphitic conductors located further to the East.

Given the increased content of sulphides at deeper levels and the lateral continuity of mineralization, it is suggested to continue with borehole geophysical exploration (EM and magnetics) to be used in long range exploration drillholes, in order to scan broader extents of the magnetite and Cu mineralization in the D zone.

Figure 8.5. Drillhole VDD0242 @482m. Roughly banded Cu sulphide mineralization (chalcopyrite) replacing along margins of magnetite zones and disseminated carbonates in the D ore.

Figure 8.6. Chalcopyrite carbonate vein cuts through coherent intrusive units located on the hanging wall side of the D lens. The epigenetic origin of this type of Cu mineralization correspond to a group of reactivated structures and dikes orthogonal to the sedimentary trend that might be associated with tensional dislocation and sulphide remobilization along mechanically competent units.

9.0 ESTIMATION AND REPORTING OF MINERAL RESOURCES

9.1 DATABASE

The Viscaria project maintains a SQL based acQuire database for all the drillhole data. This includes collar, lithology, bulk density, magnetic susceptibility, geotechnical logging, and assay data. Data is collected by Copperstone employees using acQuire compatible logging templates. Templates are designed to contain all main validation checks in the data collection phase, and they are connected to acQuire libraries to ensure compliant data collection. Main validation includes overlapping intervals, missing intervals, and validation of used logging codes. Collected data is stored and archived in the data server and delivered to the database manager for upload to the database. The acQuire database has additional validation checks while importing and accepting data to database. The database also maintains digital audit trails containing time stamps for uploading the data, editing the data and persons involved in the database uploading. Each of the collected records also contains the date and the initials of the data collector as a digital signoff. Database security has been setup to allow edit and insert permission rights only for database manager. The acQuire database is backed up daily. Competent Person opinion is that collected data is recorded at high quality, digital audit trail is maintained, and the data is fully secured.

Drilling information from August 2019-May 2020 was collected using Excel templates and stored in the Excel spreadsheets. The data collection method has not allowed maintaining a full audit trail. However, data has been uploaded to the acQuire database through normal validation protocols and information is fully validated. Data is accepted as high-quality data by Competent Person.

Avalon Minerals Viscaria AB used acQuire database system for drilling and collecting information from 2009-2018 with similar validation procedures that are in place now. This data is well maintained and validated, and the Competent Person has accepted the data as high-quality data.

Historic information from LKAB and Outokumpu between 1970's-1990's was received as paper photocopies of the original data. Data has been digitalised and imported to the acQuire database by Avalon. A total of 32 historical drillholes are located in the Viscaria D zone and they are included in the modelling database.

acQuire database was restored in May 2020 from Avalon's Viscaria project, acQuire database backup copy is dated august 2018. Data and database were fully validated by the acQuire database manager. Competent Person opinion is that the database is of high quality for the resource estimation.

9.2 GEOLOGICAL INTERPRETATION

The Geological interpretation was created in three phases. The first phase of the geological interpretation was structural interpretation to define structural controls of the lithologies and mineralisation and to define grade continuity. Specialised Geological Mapping Ltd. was contracted for structural work. Project included fieldwork at the site with structural mapping in the field and on drill cores and structural interpretation of the ore controlling structures. Main conclusions from the structural work are:

- There are no major cross-cutting and offsetting brittle structures at Viscaria which would impact the resource estimation
- D zone mineralisation is stratiform and it is hosted by magnetite-chalcopyrite skarn
- Mineralisation has strong structural controls and high grades follows structures
- The main structure which can be identified is pinching and swelling of magnetite-skarn. Bends in the units are caused by folding
- Mineralisation and controlling structures are continuous

Based on the structural conclusion and 3D information in the drillholes, following decisions were made:

- Viscaria D zone has no brittle faults and therefore a fault model cannot be constructed
- Change of the orientation of lithologies in the shallow depths of 100-150 metres below surface can be seen in the 3D and cross-sections (figure 9.1). This deflection point is an important subdomain boundary for the estimation.

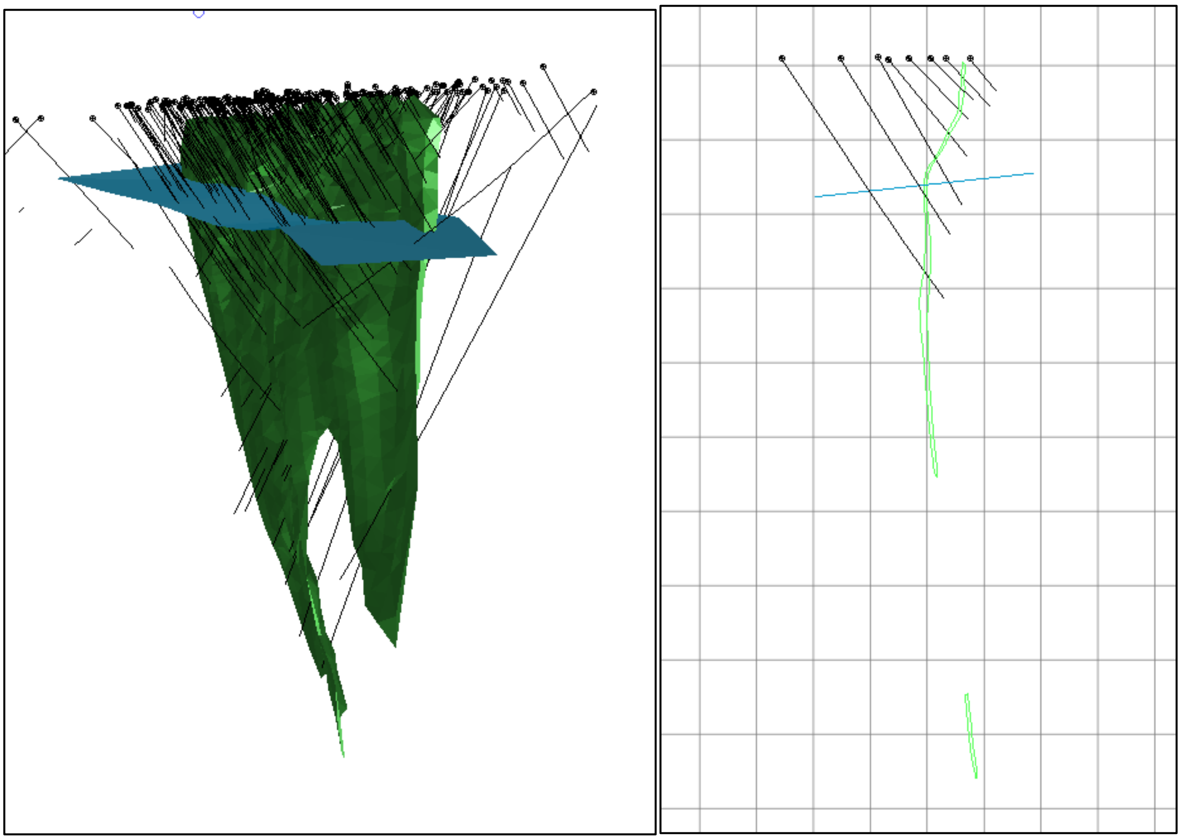


Figure 9.1. Left (3D image of the D1 main mineralisation in green and subdomain boundary in blue. Subdomain boundary shows distinct change of the orientation of mineralisation. Right. Cross sectional view of the D1 main mineralisation (green) subdomain boundary (blue). Grid shown is 100m x 100m.

The second phase of the geological interpretation was lithological interpretation. Lithological interpretation was used to assist mineralisation interpretation and define densities for different country rocks in the area. Lithological interpretation was done using cross-sectional interpretations in the paper for the key profiles and in cross-sectional interpretation in the 3D modelling software. 26 oblique cross sections were defined and modelled covering the deposit. Six different rock types were modelled. Modelled rock types were from foot wall to hanging wall.

- Foot wall basalt
- Foot wall breccia
- Magnetite-chalcopyrite skarn
- Marble
- Metasediments
- Mafic sills intruding metasediments

Pikse Basalt The principal lithology in the stratigraphic foot wall to the Viscaria D Zone deposit is the Pikse Formation which comprises a series of subaerial amygdaloidal basalt flows that have been metamorphosed to greenschist facies. This lithology is characterised by a strong coherent drill core. The lithology is dominantly chlorite-altered and is characterised by extensive carbonate veins that typically comprise 1 to 4% of the rock volume. The Pikse Basalt for the most part is weakly foliated by a regional schistosity, however as the contact with the Viscaria Formation is approached from the west side, the degree of shearing and foliation within the Pikse Basalt becomes increasingly intense, and locally a mylonitic fabric is developed in areas where the shearing is highly focused.

Western Breccia The Western Breccia is a 2 m to 8 m wide subvertical zone of breccia of uncertain genetic origin, although it is suspected to be of tectonic origin. The Western Breccia unit typically runs along the contact between the Pikse Basalt to the west and the magnetite-skarn unit to the east, and lies along the stratigraphic foot wall to the D Zone mineralisation. However, on the shallow part of some cross-sections where the basalt-magnetite skarn contact dips increasingly westward, the Western Breccia appears to cross-cut the Pikse Basalt. Locally, clasts of massive magnetite have been seed within the breccia, implying that it may have a post-mineralisation timing.

Magnetite-chalcopyrite skarn The main bodies of copper sulphide mineralisation at D Zone occur within two main magnetite-chalcopyrite-skarn units that lie within a broader magnetite skarn package of carbonate-rich rocks that have variable magnetite content. The iron-oxide mineral is almost exclusively magnetite below the zone of oxidation. In hand-specimen, the magnetite skarn bodies vary from massive to semi-massive magnetite with minor interstitial and potentially recrystallised carbonate with a crude banded texture, to zones of lesser magnetite development but with substantial carbonate content. Narrow zones of chlorite and talc schist are also observed intercalated with the magnetite-skarn sequence. The magnetite is interpreted to replace a precursor carbonate-rich horizon, the latter marking the initial submergence of the subaerial Pikse basalt sequence below a local deepening rift-related subbasin. The magnetite-skarn unit shows an inverse thickness relationship with respect to the Eastern Marble unit, i.e. broadly, as the thickness of the magnetite-skarn unit increases so the thickness of the Eastern Carbonate unit decreases, and vice-versa. This is consistent with a replacement origin of the magnetite, with iron-rich hydrothermal fluids reacting with the carbonate and replacing it with magnetite.

Marble The Eastern Marble unit lies in the immediate stratigraphic hanging wall to the mineralised magnetite-skarn units. It occurs sporadically along a significant length of the D Zone mineralised horizon. It displays significant thickness variation along strike that is interpreted to reflect variation in the intensity of magnetite-skarn replacement along the base of this carbonate unit. The magnetite-skarn which underlies the Eastern Marble unit often displays a gradual transition from magnetite-skarn to marble that occurs over several metres, consistent with the Eastern Marble unit being a relic of the primary carbonate-rich horizon that was replaced by the ironstone bodies.

Metasediment The metasediment lies in the hanging wall to the D Zone orebody and is in direct contact with either the magnetite-skarn unit or the Eastern Carbonate unit (Figure 6.3). The metasediment comprises thin millimetre- to centimetre-scale interlaminations of fine grained and coarse-grained tuffaceous siltstone. Soft sediment deformation structures such as small-scale slumps are commonly preserved within the sequence. The sequence is interpreted to have been deposited in an intermediate water depth, below wave base, within the subbasin in which the Viscaria Formation was deposited.

Eastern Gabbro Further to the east of the D Zone ore body, the metasediment of the Lower Viscaria Formation is intruded by a gabbro body that is interpreted to be a late post-mineral sill. It is around 100 m in true thickness and lies between the metasediments and the graphitic shale package that defines the ’C-Zone horizon‘.

Two surfaces of oxidation have been created. Base of the partial oxidation/top of fresh rock (partial oxidation) and base of the complete oxidation (total oxidation) was interpreted in the cross-sections. The Base of Partial Oxidation (BOPO) surface was interpreted below where lithological units were logged as being either weakly, moderately, or strongly weathered. The Base of Complete Oxidation (BOCO) surface was interpreted below where lithological units were logged as completely weathered. The BOCO surface is confined to the top 100m of the deposit and is poddy. The BOPO surface is also poddy but appears to follow structures that allowed penetration of oxidised surface water. Importantly, these structures are primarily located in the breccia and have little impact on the oxidation of copper sulphide species within the magnetite-skarn unit at depth. Figure 9.2 shows weathering modelling.

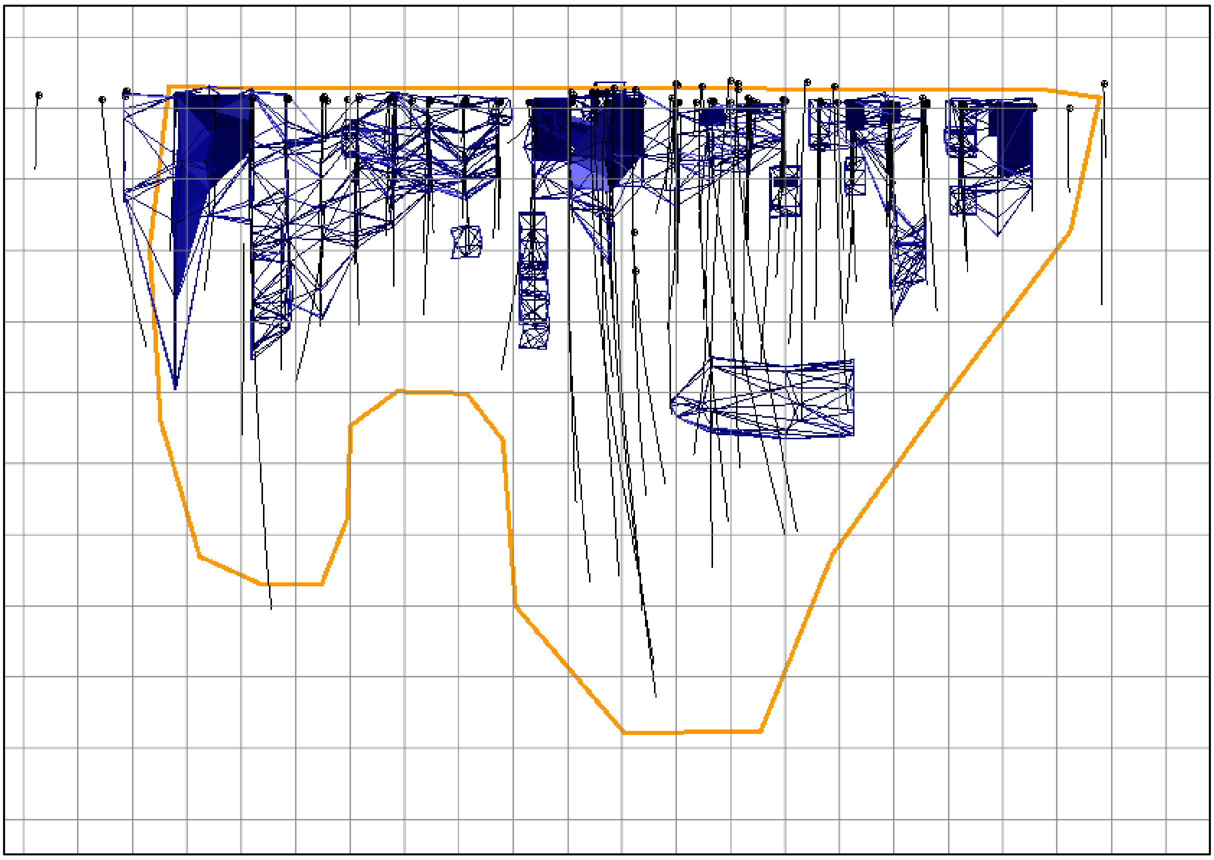


Figure 9.2. Longitudinal NE-SW image over Viscaria D zone showing location of the oxidation zones. Blue polygons show Complete Oxidation and blue triangles show partial oxidation. The Mineral Resource outline is shown in orange line and a 100mx100m grid is shown for scale.

The third phase of geological modelling was mineralisation interpretation. Three different mineralisation zones were modelled – D1, D2 and D3 copper mineralisation. D1 is the main mineralisation and it is typically located in the magnetite-skarn and metasediments contact. D2 mineralisation is modelled in the deeper part of the D zone north. It locates into contact between magnetite-skarn and the hanging wall metasediments. D3 locates to mainly in the shallower part of the D zone and it forms two different zones – D3 north and D3 south. All mineralisation has been modelled using 0.7% copper cut-off with strong guidance from the structural and geological interpretations. Figure 9.3 shows lithological units controlling mineralisation in the D zone and figure 9.4 shows mineralisation zones.

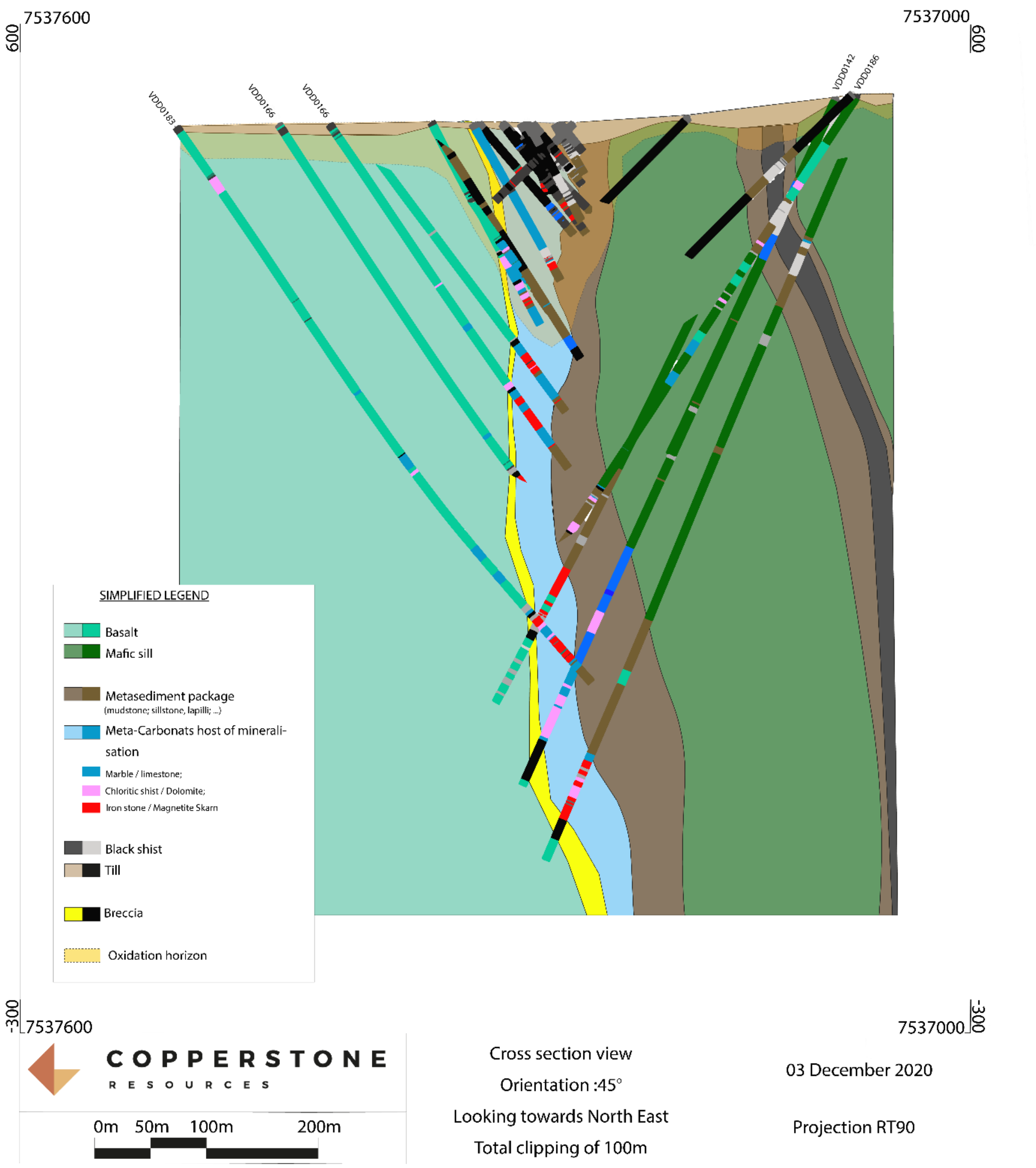


Figure 9.3. Lithological units in the Viscaria D zone

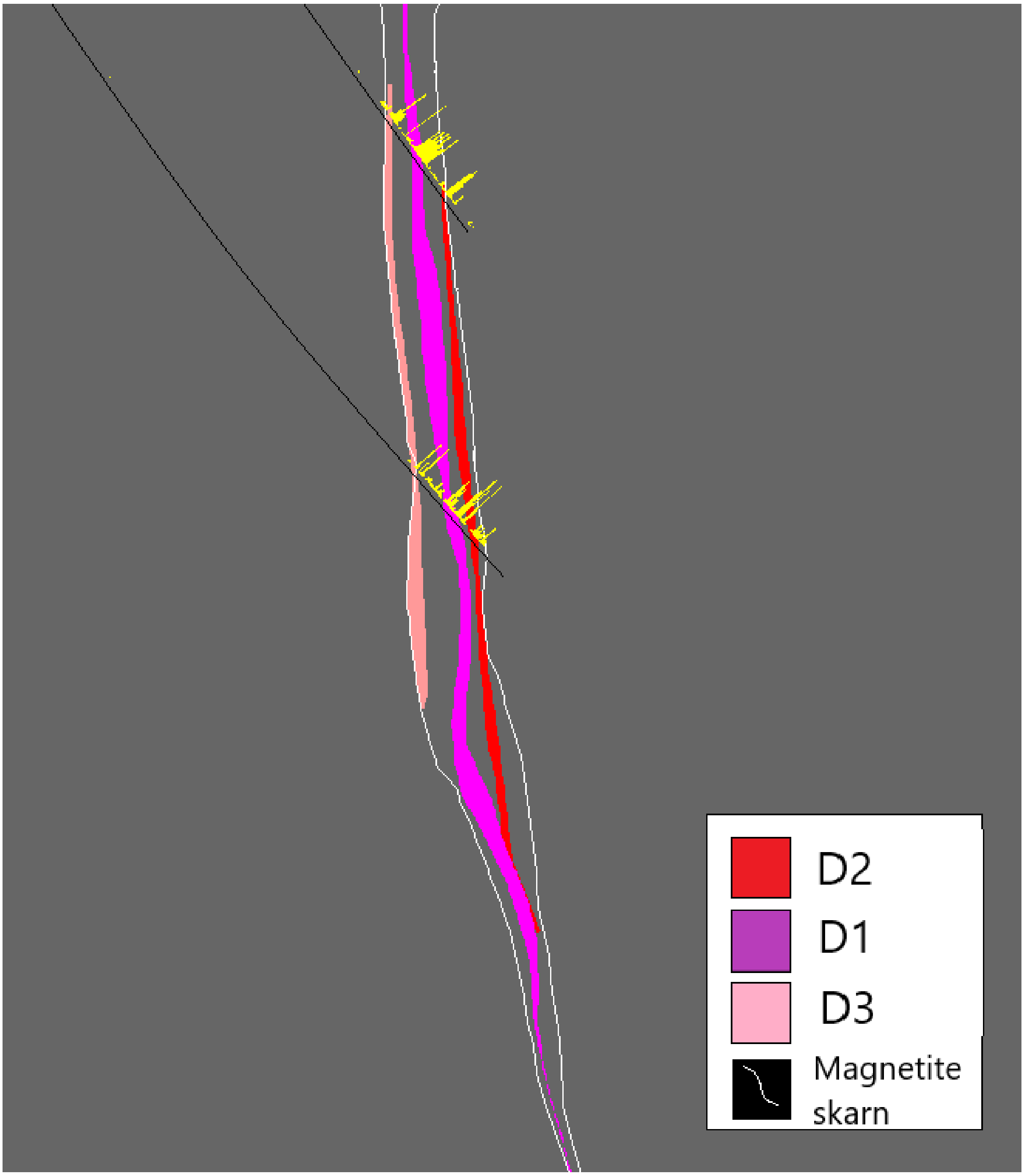


Figure 9.4. Mineralisation interpretation in the Viscaria D zone

9.3 COMPOSITING

Samples were composited to 1 metre composites. One metre sample size is the most common sample length in the database (40% of all samples are 1 m) and 90% of sample population is 1 m or less. Based on length statistics, 1 m was selected for composite length. Small amount of data (10%) is longer than selected composite length which causes some samples to be cut in compositing process. However, the amount of split samples is minor, and it is assumed to have minor impact for the estimation. Sample database also contains long sample intervals from historical drilling. Long samples, greater than 3 metres were deleted from the estimation due to the historical nature and unrepresentative sampling. The number of deleted samples due to sample length is 39. Figures 9.5 and 9.6 shows statistics of the sample intervals.

Compositing was done using Surpac's downhole compositing tool in each of the domains individually. Best fit compositing method was used as compositing with 1 m average composite length. The best fit method creates composites by adjusting composite lengths close to 1 metre and giving equal length to each of the composites. Average sample length after compositing was 0.97 metres. The best fit compositing process creates a small number of short samples. These short samples can create bias to estimation by the volume-variance effect, as they have the same weight in the block estimates as 1 metre composites. However, number of short samples is small and their impact on estimation is negligible. Short samples were included to the estimation process.

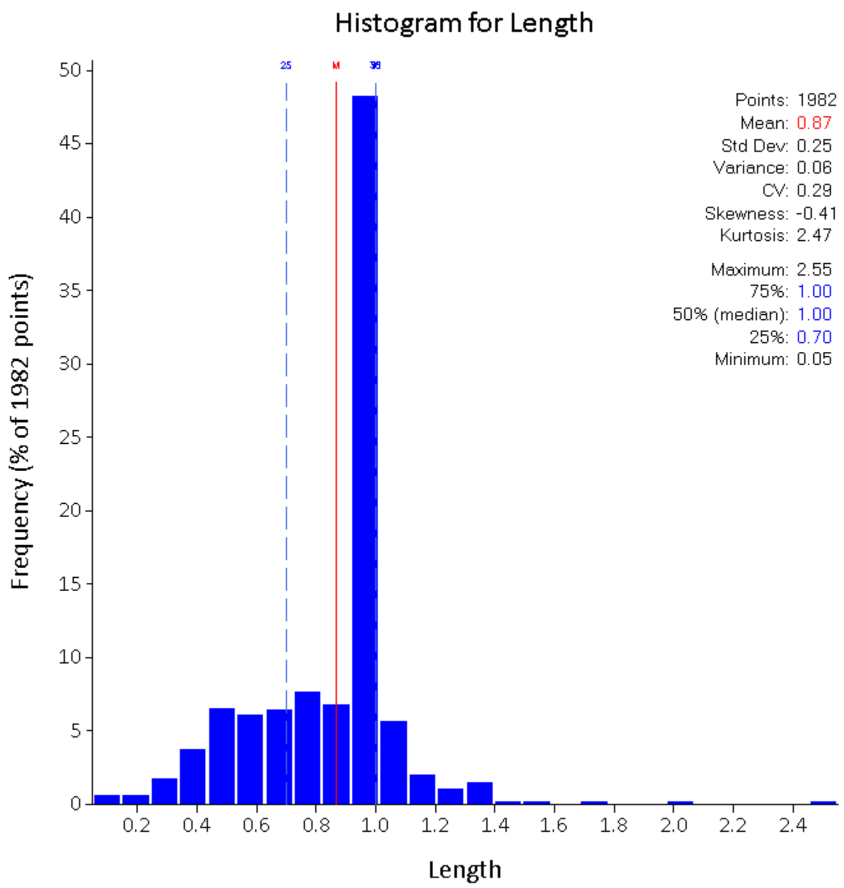


Figure 9.5. Histogram of sample lengths of mineralised domain before compositing.

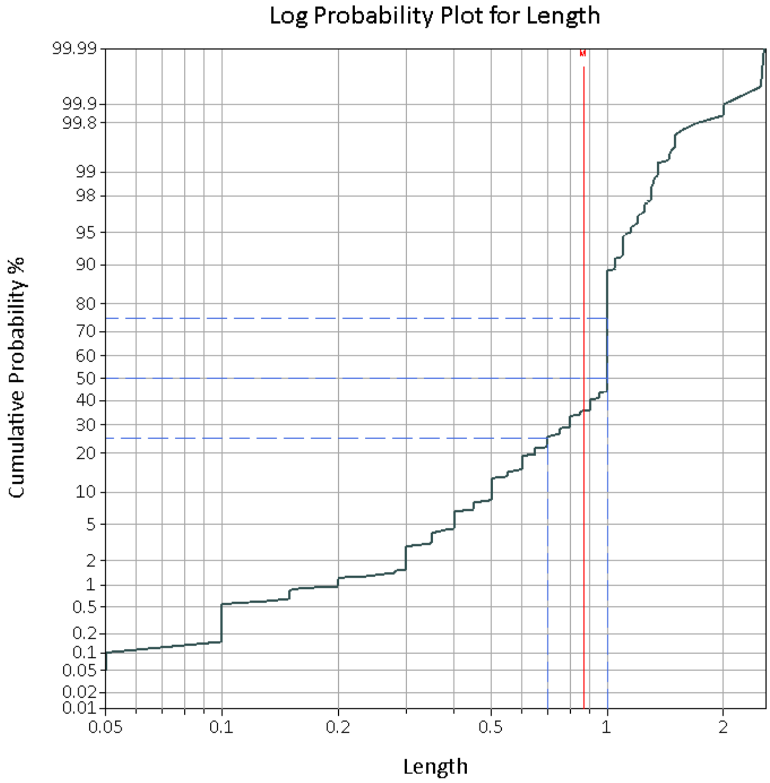


Figure 9.6. Log-probability plot of sample lengths of mineralised domain before compositing.

9.4 DECLUSTERING

Geological information is typically clustered. Clusters can be caused by practical limitation to drill deposit in the even grids or more typically, by economic factors when higher grade areas are more densely drilled than lower grade areas. The latter is a typical feature in all the projects and shows normal good practise with managing exploration cash expenditure and risks.

Clustered data creates bias (almost always positive bias) for estimation if it is not properly managed in the process. Ordinary kriging estimation method uses kriging matrix for grade calculation which has a screening effect feature plugged. The screening effect decreases kriging weights of the samples which are close to each other and therefore removes clusters in the calculation process. However, composite data needs to be handled with cluster removal process for geostatistical analysis, variography and especially model validation such as sample vs model grade comparison before geostatistical grade calculations.

Declustering analysis was completed using a cell declustering method. Cell declustering is a method which subdivides the whole sample population in equal sized cubes/cells. The method analyses a number of data points inside the cell and gives weighing which is proportional to the number of samples in the cell. Declustering analysis was done using 120 different sizes and shapes of cells and analysing how mean grade of the main mineralisation (domain 101) changes with different cell sizes. Deflection point, where gradient of slope in the graphs decreases, was selected for optimal declustering size. The selected cell size also matches with the drilling grid information. Figure 9.7 shows declustering analysis data.

50m x 50m x 25m was selected for the declustering size based on the declustering analysis. Table 9.1 shows comparison of the grades in the domains before and after cell declustering. Cell declustering decreased copper grade by 5% from the clustered data. Individual domains has changes inside 0- -6% variations excpect domains 111 (-12%) and 103 (+5%). D3 (103) has positive change. Positive change is seen normally in similar domains than D3 which is intersected before the main mineralisation. In those domain intersections, location is defined by main mineralisation instead of hanging wall mineralisation. Domain 111 grade decrease is rather large. Reasons for large decrease was investigated without finding solid conclusions. However, it is noted that the model grade vs sample grade validation shows positive bias toward model grades for domain 111 which indicates that cell declustering cell size was not optimal for this domain. All the declustered data was accepted to the estimation as it is.

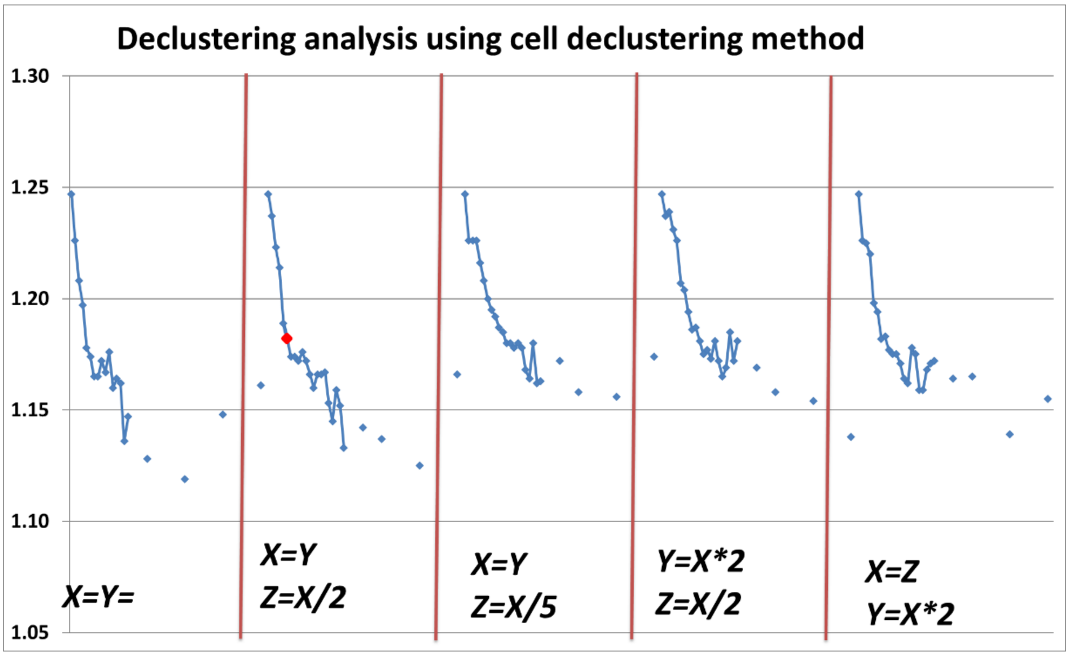


Figure 9.7. Declustering analysis to test impact of sample clusters to the mean grade. Domain 101.

Table 9.1x. Comparison of raw clustered data of the domains against cell declustered data.

Filters	Samples	Raw Cu (%)	Declustered Cu (%)	Difference (%)
All domains	1680	1.27	1.21	-5%
101 Cu	641	1.22	1.19	-3%
102 Cu	191	1.46	1.46	0%
103 Cu	162	1.05	1.10	5%
111 Cu	389	1.34	1.18	-12%
161 Cu	53	0.80	0.79	-2%
171 Cu	244	1.42	1.34	-6%

9.5 TOPCUTTING

Geological populations are normally forming natural gaussian shape distributions with well-defined shapes in the middle and less defined tails. Probability of sampling to happen in the tails is statistically significantly less than in the middle. Sampling can also intersect unusually high-grade samples in the tails which shows as extreme outliers in the sample population. These extreme outliers or poorly defined tails of the histogram can create positive bias to resource estimation.

Global topcut analysis was performed for Cu, Fe and S for all the domains in the estimation. Shape and continuity of the histogram, CV of the data population, continuity of data in the log-probability plot and cumulative metal in the mean-variance plots was included to global topcut analysis to evaluate influence of extreme grade values in the estimation. All the elements and domains showed well defined normal grade distributions with relatively low uncut CV's and very low sensitivity of metal content to topcut grades. As a rule of thumb, domains should have CV's lower than 1.2 for estimation calculation. Domains with CV higher than 1.2 needs to be topcut because of the impact of the extreme outliers for estimation may be high.

CV of all the Viscaria D zone domains is lower than 1.2. This indicates minimal need for topcutting and outliers should not have impact to the estimation. However, 5% Cu topcut was used for domains 101 and 111 (D1 mineralisation subdomains). Applied topcut strategy decreased metal by 1% from declustered composited sample population to topcut declustered composited sample population. A conservative approach was chosen to minimize the risk related to a few individual high-grade samples inside the main mineralisation D1. The amount of cut samples was low (8). Figure 9.8 shows example of global topcut analysis.

Other elements or other domains did not require any topcutting.

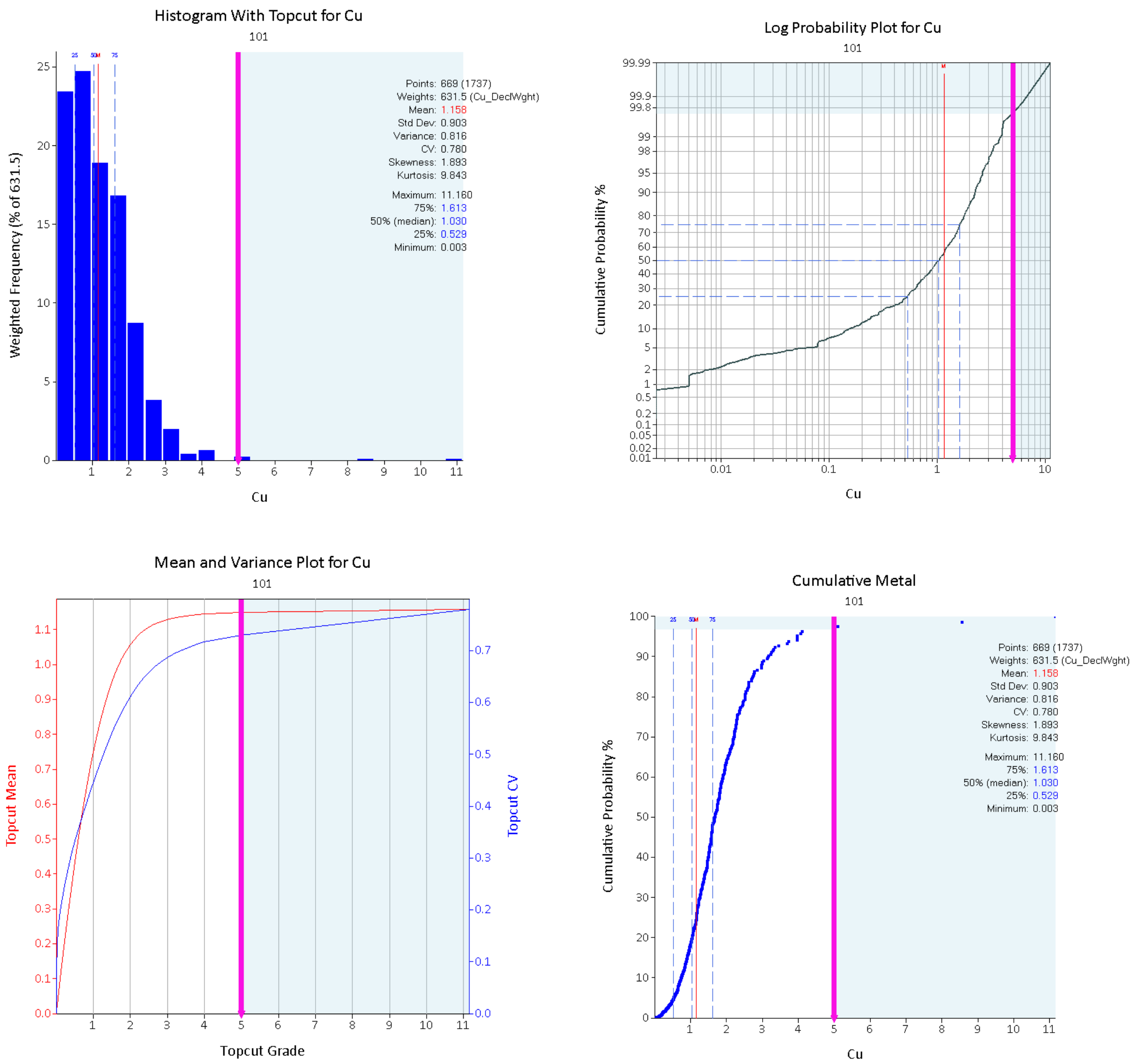


Figure 9.8. Topcut analysis using continuity and tail of the histogram (top left), change of the slope in the log-probability plot (top right), mean-variance plot (bottom left) and cumulative metal (bottom right).

9.6 UNIVARIATE STATISTICS

Detailed univariate statistical analysis was completed for all the copper mineralisation domains (101, 102, 103, 111, 161, 171) and for magnetite skarn (100). Statistical analysis was completed for Cu, Au, Zn, Co, Ni, S, Fe and bulk density. Statistical analysis has three main objectives – 1) confirm and validate quality of domaining/interpretation, 2) confirm that the domain is statistically suitable for ordinary kriged calculations and 3) improve geological understanding of the domains.

As stated before, geological domains are typically following normal gaussian distributions. This can be seen for example in the bell-shaped forms of normal score or logarithmic histograms. Linear estimation methods including ordinary kriging assumes single grade population. That requires geological domains to be defined based on the single geological grade population.

Figure 9.9. shows copper log-histograms for domains 101, 102, 103, 111, 161 and 171. Domains shows normal gaussian distributions. However, domain 101 (D1 fresh and deep mineralisation), 161 (completely oxidized D1) and 171 (partially oxidized D1) shows clear second grade population which locates left from the main peak. This is caused by internal lower grade dilution included in the mineralisation shapes. Further investigations with non-linear estimation methods such as MIK and UC should be considered to evaluate the importance of the second-grade population. A potential implication of internal low-grade zones could be that if lower grade zones are selectively minable and separatable then mineral resources could be slightly lower in tonnage and slightly higher in grade. The amount of internal dilution is minor, and domains are accepted for estimation as they are. Variability of the domains is inside the normal variability of this style of deposit.

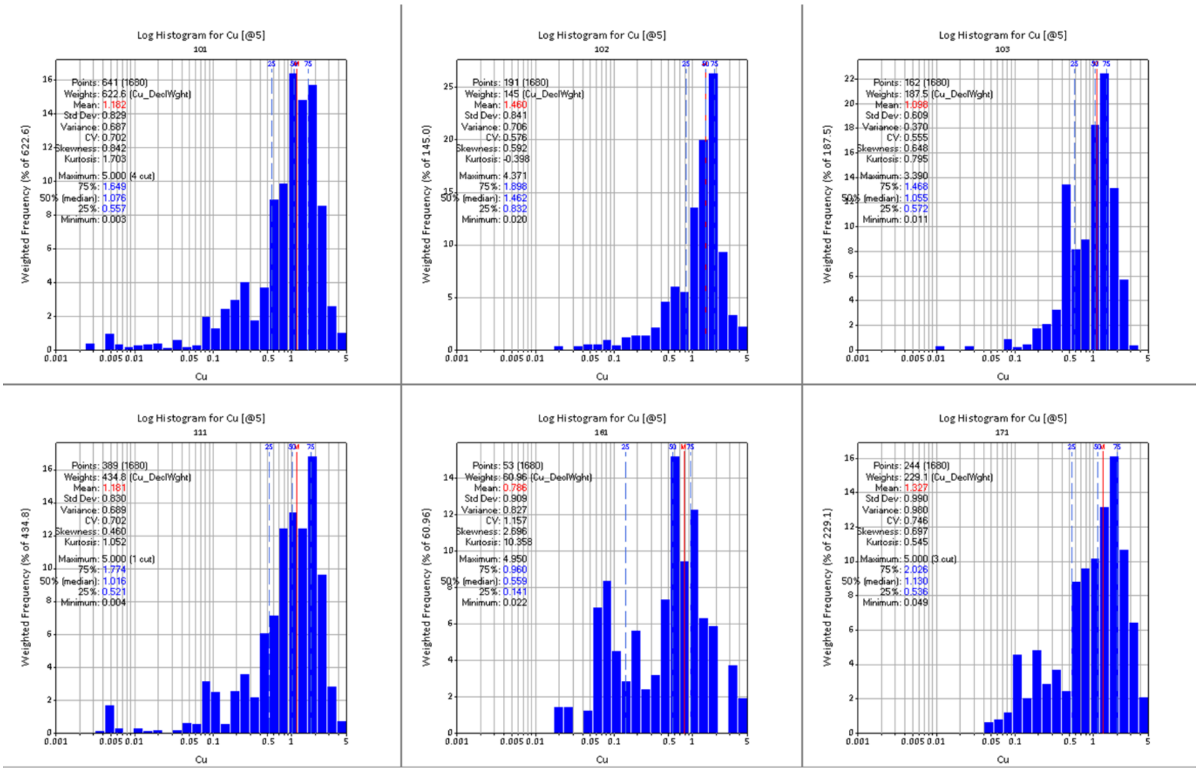


Figure 9.9. Copper grade population in the log histogram. X-axis shows copper grade and y axis shows frequency. Domains from left to right are top row 101, 102, 103 and bottom row 111, 161, 171.

Figure 9.10 shows iron log-histograms for domain 101, 102, 103, 111, 161 and 171. All domains show gaussian shape distributions. Iron behaves typically differently than other metals. Other metals are positively skewed with a long tail of sample grades in the high-grade end of the spectrum. Iron grade population in negatively skewed with no tail in the high-grade population and clear tail in the low-grade population. Based on the review of the iron statistics for all the domains, all domains were accepted as suitable domains for grade estimation.

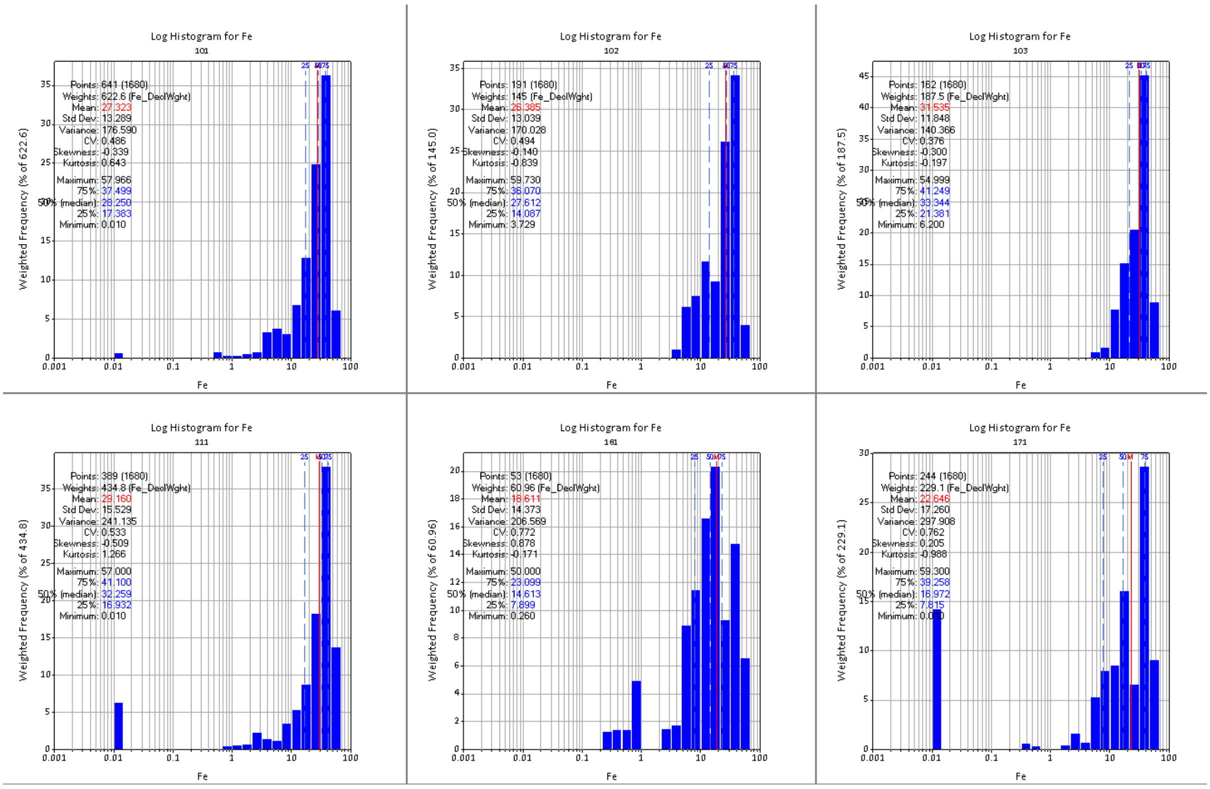


Figure 9.10. Iron grade population in the log histogram. X-axis shows iron grade and y axis shows frequency. Domains from left to right are top row 101, 102, 103 and bottom row 111, 161, 171.

Table 9.2. shows summary of the copper univariate statistics for copper mineralisation domains. Statistics is shown with composited, declustered and topcut data. Mean grades of the domain is averaging 1.2% Cu and populations are positively skewed with low CV's.

Table 9.2 Univariate statistic of Cu in the domains

Assay	*Filters*	*Samples*	*Top Cut Count*	*Minimum*	*Maximum*	*Mean*	*Standard deviation*	*CV*	*Variance*	*Skewness*
Cu	All domains	1680	8.00	0.00	5.00	1.20	0.84	0.70	0.71	0.76
Cu	101 Cu	641	4.00	0.00	5.00	1.18	0.83	0.70	0.69	0.84
Cu	102 Cu	191	0.00	0.02	4.37	1.46	0.84	0.58	0.71	0.59
Cu	103 Cu	162	0.00	0.01	3.39	1.10	0.61	0.56	0.37	0.65
Cu	111 Cu	389	1.00	0.00	5.00	1.18	0.83	0.70	0.69	0.46
Cu	161 Cu	53	0.00	0.02	4.95	0.79	0.91	1.16	0.83	2.70
Cu	171 Cu	244	3.00	0.05	5.00	1.33	0.99	0.75	0.98	0.70

Table 9.3. shows summary of the iron univariate statistics for iron mineralisation domains. Mean grades of the domain is averaging 27% Fe and populations are negatively skewed with low CV's.

Table 9.3 Univariate statistic of Fe in the domains

Assay	Filters	Samples	Top Cut Count	Minimum	Maximum	Mean	Standard deviation	CV	Variance	Skewness
Fe	Fe	1680	0.00	0.01	59.73	27.23	14.64	0.54	214.37	-0.25
Fe	101 Fe	641	0.00	0.01	57.97	27.32	13.29	0.49	176.59	-0.34
Fe	102 Fe	191	0.00	3.73	59.73	26.39	13.04	0.49	170.03	-0.14
Fe	103 Fe	162	0.00	6.20	55.00	31.54	11.85	0.38	140.37	-0.30
Fe	111 Fe	389	0.00	0.01	57.00	29.16	15.53	0.53	241.14	-0.51
Fe	161 Fe	53	0.00	0.26	50.00	18.61	14.37	0.77	206.57	0.88
Fe	171 Fe	244	0.00	0.01	59.30	22.65	17.26	0.76	297.91	0.21

Table 9.4. shows summary of the sulphur univariate statistics for iron mineralisation domains. Mean grades of the domain is averaging 1.2% S and populations are positively skewed with low CV's (except 161 and 171). Several conclusions can be made from the sulphur statistics – 1) fresh rock domains (101, 102, 103, 111) has copper to sulphur ratio close to one. This means that chalcopyrite is almost the only sulphide present and there is only a minor amount of iron sulphides (pyrite and pyrrhotite) in the domains. 2) sulphur is very low which means that total amount of sulphides is very low. 3) Subdomain 161 which is completely oxidised D1 zone has 0.01% sulphur and 0.79% copper which means that chalcopyrite is not hosting copper. 4) Partially oxidised D1 zone (171) contains 0.17%S and 1.33%Cu. This means that the copper is hosted maximum by about 10% by chalcopyrite. Remaining 90% is hosted by other non-sulphidic minerals.

Table 9.4 Univariate statistic of S in the domains

Assay	Filters	Samples	Top Cut Count	Minimum	Maximum	Mean	Standard deviation	CV	Variance	Skewness
S	S	1680	0.00	0.01	12.34	1.12	1.06	0.94	1.11	1.10
S	101 S	641	0.00	0.01	12.34	1.46	1.07	0.73	1.14	1.55
S	102 S	191	0.00	0.01	6.58	1.98	1.10	0.55	1.20	0.58
S	103 S	162	0.00	0.01	3.79	1.21	0.73	0.61	0.53	0.58
S	111 S	389	0.00	0.01	4.06	0.98	0.91	0.93	0.83	0.52
S	161 S	53	0.00	0.01	0.07	0.01	0.01	1.19	0.00	3.94
S	171 S	244	0.00	0.01	2.65	0.17	0.49	2.90	0.24	3.53

9.7 BIVARIATE STATISTICS

Table 9.5. shows summary of the sulphur univariate statistics for iron mineralisation domains. Mean grades of the domain is averaging 1.2% S and populations are positively skewed with low CV's (except 161 and 171). Several conclusions can be made from the sulphur statistics – 1) fresh rock domains (101, 102, 103, 111) has copper to sulphur ratio close to one. This means that chalcopyrite is almost the only sulphide present and there is only a minor amount of iron sulphides (pyrite and pyrrhotite) in the domains. 2) sulphur is very low which means that total amount of sulphides is very low. 3) Subdomain 161 which is completely oxidised D1 zone has 0.01% sulphur and 0.79% copper which means that chalcopyrite is not hosting copper. 4) Partially oxidised D1 zone (171) contains 0.17%S and 1.33%Cu. This means that the copper is hosted maximum by about 10% by chalcopyrite. Remaining 90% is hosted by other non-sulphidic minerals.

Table 9.5 Univariate statistic of S in the domains

101	Cu	Au	Co	Ni	Zn	S	Fe
Cu	1.00	0.75	0.28	0.35	0.13	0.93	0.36
Au		1.00	0.35	0.41	0.06	0.70	0.18
Co			1.00	0.17	0.20	0.33	0.36
Ni				1.00	0.09	0.32	0.62
Zn					1.00	0.08	0.29
S						1.00	0.29
Fe							1.00

111	Cu	Au	Co	Ni	Zn	S	Fe
Cu	1.00	0.73	0.56	0.31	0.22	0.71	0.51
Au		1.00	0.55	0.47	0.18	0.67	0.64
Co			1.00	0.36	0.22	0.50	0.51
Ni				1.00	-0.02	0.42	0.54
Zn					1.00	0.16	0.18
S						1.00	0.55
Fe							1.00

102	Cu	Au	Co	Ni	Zn	S	Fe
Cu	1.00	0.42	0.30	0.55	0.02	0.93	0.57
Au		1.00	0.23	0.12	0.00	0.45	0.12
Co			1.00	0.07	0.33	0.46	0.26
Ni				1.00	-0.02	0.49	0.46
Zn					1.00	0.02	0.08
S						1.00	0.45
Fe							1.00

161	Cu	Au	Co	Ni	Zn	S	Fe
Cu	1.00	na	na	na	na	na	na
Au		1.00	na	na	na	na	na
Co			1.00	na	na	na	na
Ni				1.00	na	na	na
Zn					1.00	na	na
S						1.00	na
Fe							1.00

103	Cu	Au	Co	Ni	Zn	S	Fe
Cu	1.00	0.78	0.51	0.16	0.01	0.92	0.51
Au		1.00	0.50	0.53	0.35	0.81	0.49
Co			1.00	0.24	0.09	0.44	0.64
Ni				1.00	-0.01	0.22	0.41
Zn					1.00	0.04	0.09
S						1.00	0.46
Fe							1.00

171	Cu	Au	Co	Ni	Zn	S	Fe
Cu	1.00	0.40	0.23	0.12	0.29	0.11	0.03
Au		1.00	0.15	0.15	-0.01	0.48	0.61
Co			1.00	-0.06	-0.03	0.13	0.60
Ni				1.00	0.40	0.01	0.26
Zn					1.00	-0.15	-0.11
S						1.00	0.30
Fe							1.00

Figure 9.11. shows bivariate scatter plots for domain 101 and different element pairs. Graph is shown in normal score space. Graph shows that only Cu-Au and Cu-S has positive moderate to strong correlations.

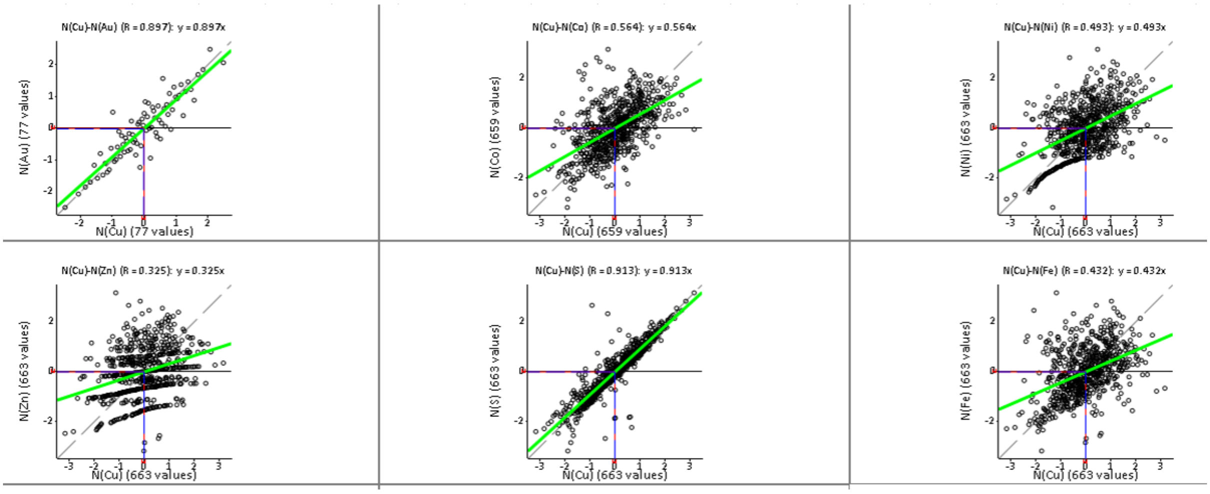


Figure 9.11 Bivariate scatter graphs in normal score scale to visualise correlation of element pairs. Data is shown for domain 101 and graphs are from left to right and top to bottom – Cu-Au, Cu-Co, Cu-Ni, Cu-Zn, Cu-S and Cu-Fe.

9.8 VARIOGRAPHY

Variography analysis was completed for the main domains for Cu, Fe, S and bulk density to establish grade continuity parameters and directional variograms for ordinary kriged estimation. Variography was done using Snowden's Supervisor geostatistical tool. Composited, declustered and topcut data was used. Due to limitations of number of samples in certain domains, some of the domains were merged.

Directional variograms were modelled to domain 101. Domains 102 and 103 was merged to 101 and 101 modelled directional variograms were validated in the merged domain. This modelled directional variogram was used to all three domains.

Directional variogram was modelled for 111. Domain 161 and 171 was merged to 111 and directional variogram was validated. This modelled directional variogram was used for all three domains.

Quality of variograms and grade continuity was at the expected level of the style of the deposit and stage of project. Directional grade continuity analysis showed strong and consistent grade continuity in the NE-SW strike plane and it was plunging 65 degrees to south. This direction matches with current understanding with the feeder structure orientations. Another grade continuity was seen in the same plane with flatter 20-25 degrees orientation which matches with the structural pinch-and-swell shapes. Secondary direction was weaker and therefore it is ignored in the modelling.

Main grade continuity direction (major direction) was commonly well defined with several points in variogram and it was very stable/unsensitive for several settings (angular tolerance, lag etc). The range of the major direction varied between 120-140 metres. Both long-range continuity and short-range continuity is well defined. Across the strike, direction (semi-major) is poorly defined. This is expected as continuity range is just in the limit of the drilling density. Range of the semimajor direction varied between 50-100 metres and only long-range continuity could be estimated. Minor direction is following true downhole characteristics.

Sample data was converted to normal score distribution for geostatistical continuity analysis. Directional variograms were modelled using nugget and two points for continuity. Nugget shows about 18-25% variability and is defined by several points in the true downhole variogram. Nugget is within expectation for this style of the mineralisation. All the directional variograms were back transformed from the normal score space back to untransformed raw space for geostatistical calculations.

Figure 9.12. shows variogram ellipsoid for Cu in the domain 101 with composite sample data. The variogram ellipsoid is oriented in the mineralisation plane NE-SW and plunges steeply 65 degrees to SW. Axis of the variograms are 140 m, 50 m and 10 m. Established variogram direction is well correlating with geological and structural understanding of the deposit. Also, ellipsoid distances are within range of typical ranges of style of the deposit.

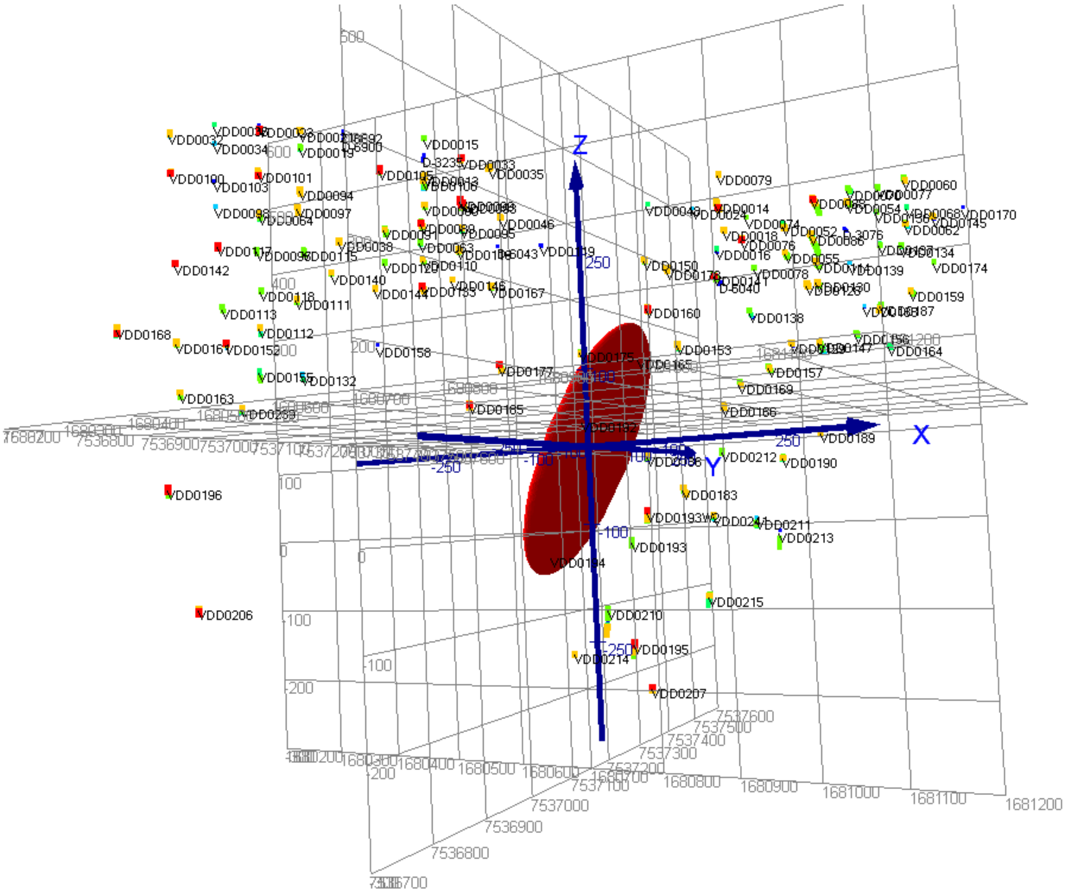


Figure 9.12 Image shows variogram ellipsoid for Cu and composite sample data in the domain 101.

Figure 9.13. shows variogram analysis for copper in the domain 101. Strike continuity direction was defined in plan view (top left). Selected direction is strike of the mineralisation. The cross-sectional view was cut to create a dip view plane (top middle). Selected dip is subvertical following the mineralisation orientation. Another plane was cut in the strike dip orientation to create the plunge view (top right). This plane is in the SW-NE longitudical orientation. Strong grade continuity was seen in the 65 degrees to southwest direction and it was selected for modelling. The next images show true downhole variogram, modelled directional variograms in direction 1, 2 and 3 (major, semi-major and minor). True downhole variogram is used to define short range variogram and nugget. It is well defined with several points. Major variogram show good long-range continuity and it is defined with several point. Direction 2 and 3 and poorly defined.

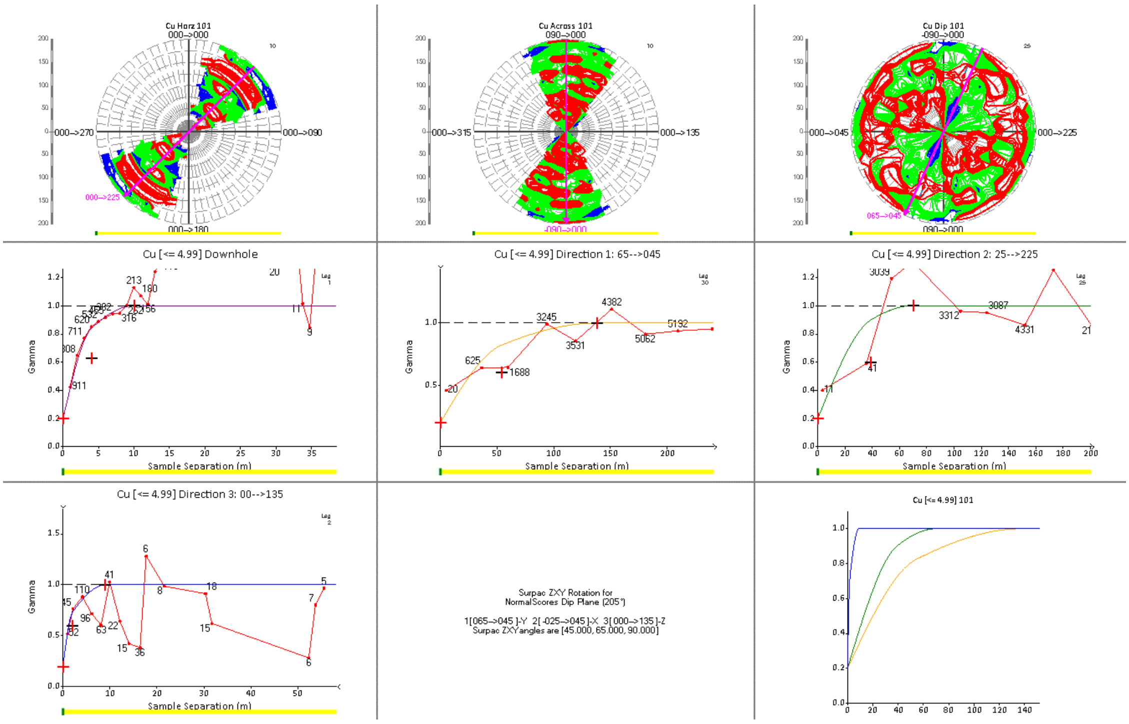


Figure 9.13. Variography analysis for copper in domain 101. Images are from left to right: top row. Variance images in the strike plane (left), dip plane (middle) and plunge plane (right). Center. True downhole variogram (left), directional variograms major direction (center), semi-major direction (right). Bottom. Minor direction (left), modelled direction definitions (center) and modelled variograms in normal score space (right).

Figure 9.14 shows directional variogram modelling for Fe in the domain in similar way than previously shown for Cu. Overall same characteristics can be seen from iron than in copper. Variograms are slightly better defined than for copper and even second direction is defined with few points.

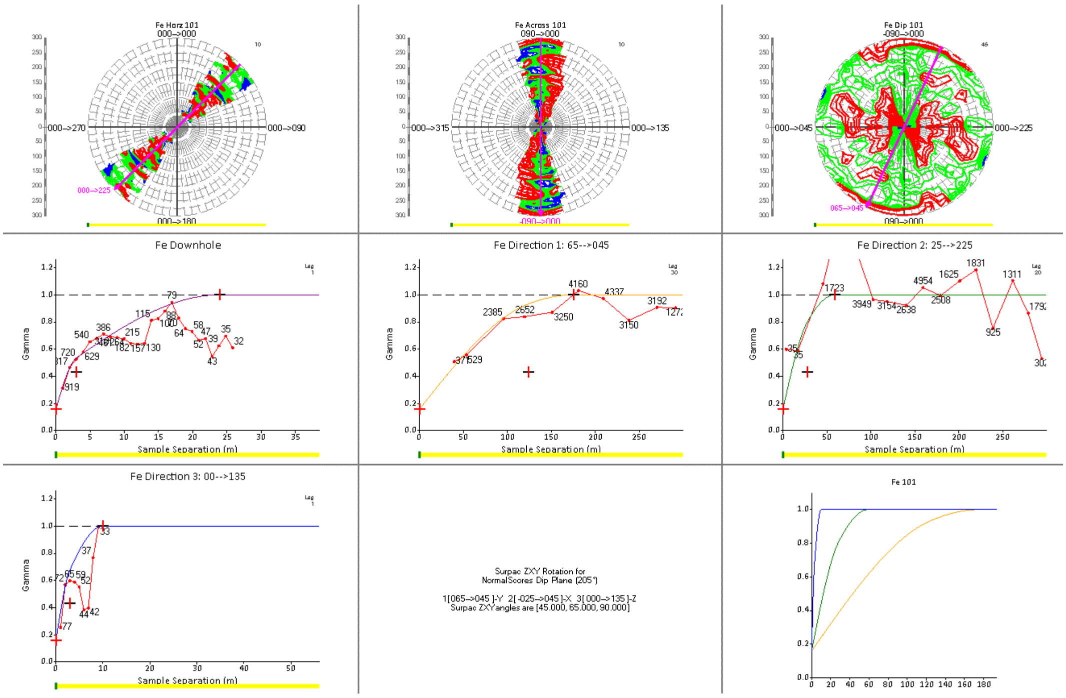


Figure 9.14. Variography analysis for iron in domain 101. Images are from left to right: top row. Variance images in the strike plane (left), dip plane (middle) and plunge plane (right). Center. Directional variograms major direction (left), semi-major direction (center) and minor direction (right). Bottom. True downhole variogram (left), modelled direction definition (center) and modelled variograms in normal score space (right).

Figure 9.15. shows modelled directional variogram for Cu and Fe with backtransformation applied.

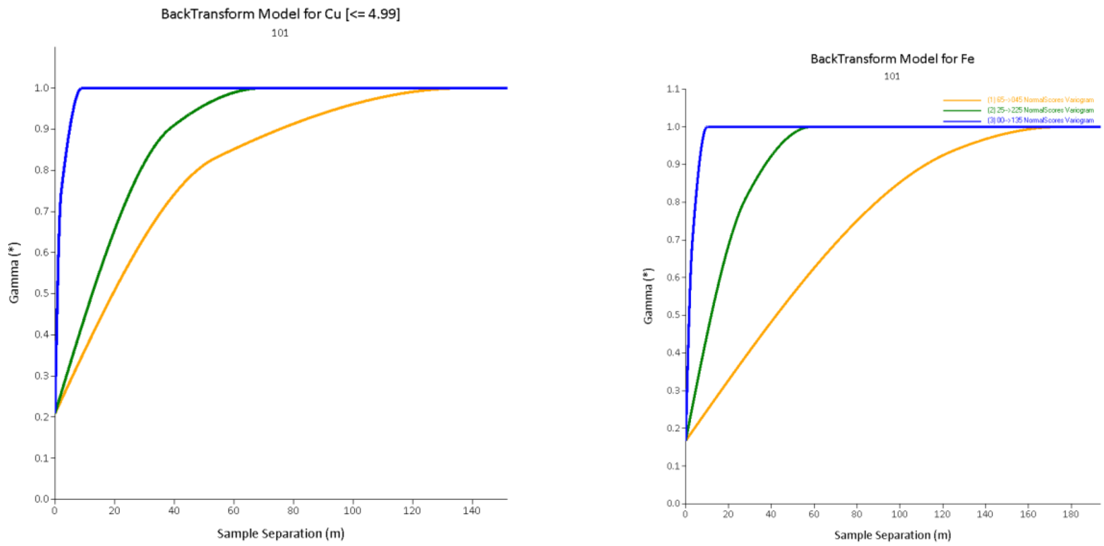


Figure 9.15. Modelled directional variogram for Cu (left) and Fe (right) with backtransformation applied

9.9 QUANTITATIVE KRIEGING NEIGHBOURHOOD ANALYSIS

Quantitative kriging neighbourhood analysis was performed for one block of domain 101 in the well-informed area and one block of domain 101 in poorly informed area. Objective of the analysis was to define 1) optimum search and estimation parameters for project data and 2) understand behaviour of the search neighbourhood and estimation parameters. Following parameters were optimized in listed order – 1) size and shape of the block model, 2) shape and distances of the search ellipsoid, 3) maximum number of samples used for interpolating the block and, 4) minimum number of samples used to inform a block. Each of the parameters were optimized at one time using kriging efficiency (KE) and slope of the regression (ZZ) to evaluate the quality of the estimation. As a general rule – estimation quality improves when size of the estimated block increases, or search neighbourhood parameters increases. This indicates that the accuracy and confidence of estimation is better in larger scale. However, the downside of bigger estimation volumes and search neighbourhood is that selectivity and local accuracy is decreasing in the process. Aim of the QKNA analysis was to define parameters which increases estimation quality to required level for pre-feasibility study level requirements and which still reflects local features. This is normally done defining deflection point where significant change of slope in the quality parameters occurs vs simulated feature occurs.

Viscaria D zone QNKA showed that estimation requires relatively large block size, large search ellipsoids and large number of informing samples. Following set of parameters was selected for estimation after balancing estimation quality and local estimation:

- Block size: 40m x 20m x 20m. Long axis along the strike
- Search ellipsoid: 100m x 50m x 25m. Search ellipsoid oriented in the variogram ellipsoid direction and distances matching with ranges of variograms
- Maximum number of informing samples: 20
- Minimum number of informing samples: 6

Competent Person opinion is that selected parameters provide robust resource estimation for basis of the pre-feasibility study level of project for mine planning usages which needs accuracy in the global scale.

Further upside in the model may exist when close spaced drilling is completed to allow more local estimation.

9.10 BLOCK MODEL PROTOTYPE

3D-block model was created using Surpac block modelling tools. Prototypes origo was set in the SW corner of the Viscaria D zone and 45 degrees rotated block model was created. Rotated block model was used to match direction of the blocks with the strike of the mineralisations. Block model extents were 640m, 1800m and 1200m in the x, y and Z directions respectively. Size of the parent block was 20m x 40m x 20m in the x, y and Z directions respectively based on the QKNA. Further subcelling for 0.625m x 1.25m x 0.625m was defined to fill mineralisation correctly. Table 9.6 shows summary of the prototype parameters and figure 9.16 show plan view image of the block model.

Search strategy was completed in the two search passes. First search pass is more local, and second search pass is done using wider search envelope for the blocks that was not informed in the first round of search. 1st search envelope parameters are selected based on the QKNA.

Table 9.6. Estimation and search neighbourhood parameters.

Parameter	***Setting***
Prototype	
X origo	7536 700mE
Y origo	1679 850mN
Z origo	-500m RL
X entent	640
Y entent	1800
Z entent	1200
Block size Subcell size	20m x 40m x 20m 0.625m x 1.25m x 0.625m
Search volume 1 Search distance Minimum number of samples Maximum number of samples Octant search Maximum per octant	 100m x 50m x 25m 6 20 Not Applied
Search volume 2 Search distance Minimum number of samples Maximum number of samples Octant search Maximum per octant	 300m x 200m x 100m 4 16 Not Applied

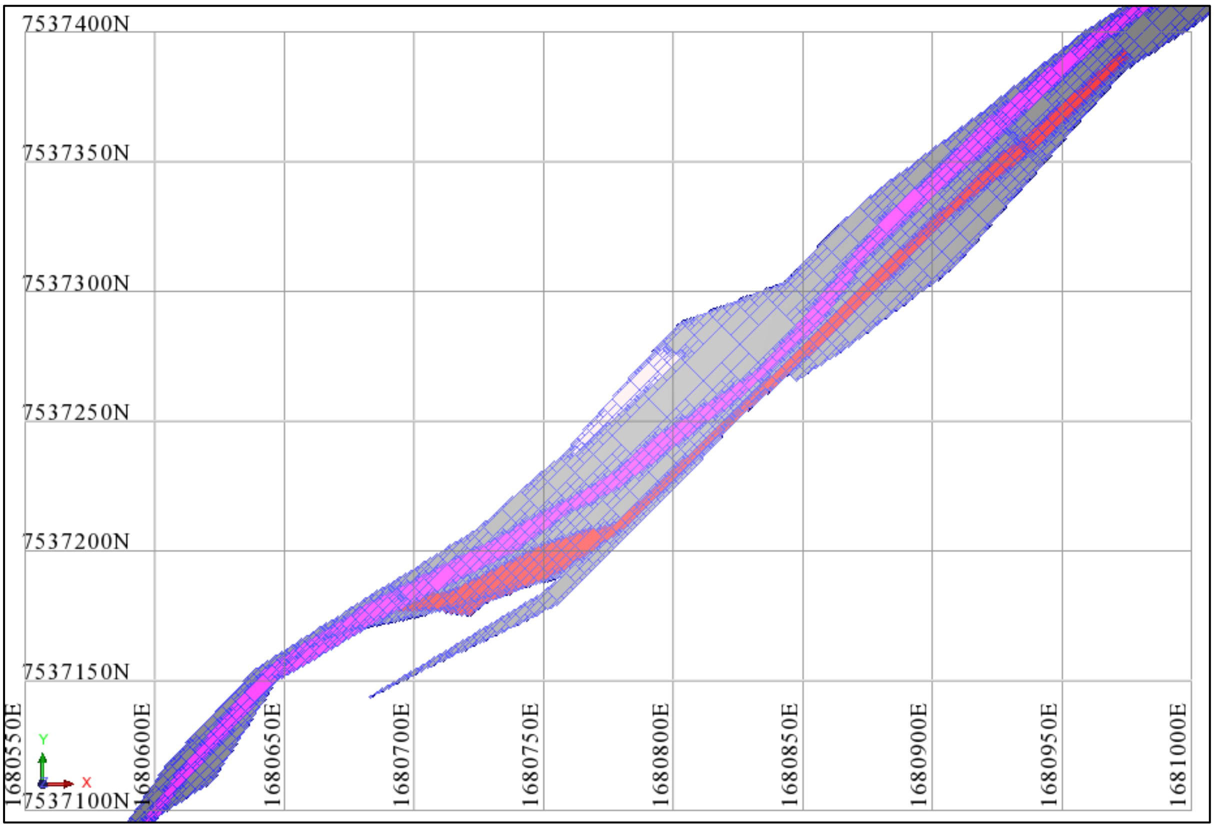


Figure 9.16. Plan view of the Viscaria D zone at elevation 0mRL which is about 500 metres below surface. Orientation of the rotated block model vs magnetite skarn shape (yellowish gray), D1 mineralisation (purple) and D2 mineralisation (red).

9.11 ORDINARY KRIEGED GRADE ESTIMATION

Ordinary kriging was selected as estimation method based on the geostatistical analysis, the style of the deposit and the amount of drilling. Ordinary kriging is the standard method used by the industry.

All the steps of the estimation were completed using Surpac software. Each of the steps were programmed to the Surpac macros to ensure systematic, repeatable, and auditable resource estimation. Ordinary kriged estimation included the following steps:

1. Drillhole database management with compositing, topcutting and domain coding for all mineralisation domains (101, 102, 103, 111, 161, 171) and magnetite skarn (100)
2. Creation of an empty block model prototype
3. Coding of rock types to the blocks using geological interpretation shapes
4. Coding of mineralisation domain codes to block model using interpreted mineralisation domains (101, 102, 103, 111, 161, 171) and magnetite skarn (100)
5. Estimating the grade of the blocks for each domain using 1) domain coded composites, 2) search neighbourhood parameters and 3) modelled directional variogram parameters. Estimation was done for all mineralisation domains (101, 102, 103, 111, 161, 171) and magnetite skarn (100) and following elements – Cu, Fe and S
6. Density estimation
7. Resource classification definition

Figure 9.17 shows an example of the final block model after ordinary kriged estimation. Image shows profile in the D zone south. Estimated block model grades are shown in filled shapes which is coloured by copper grade

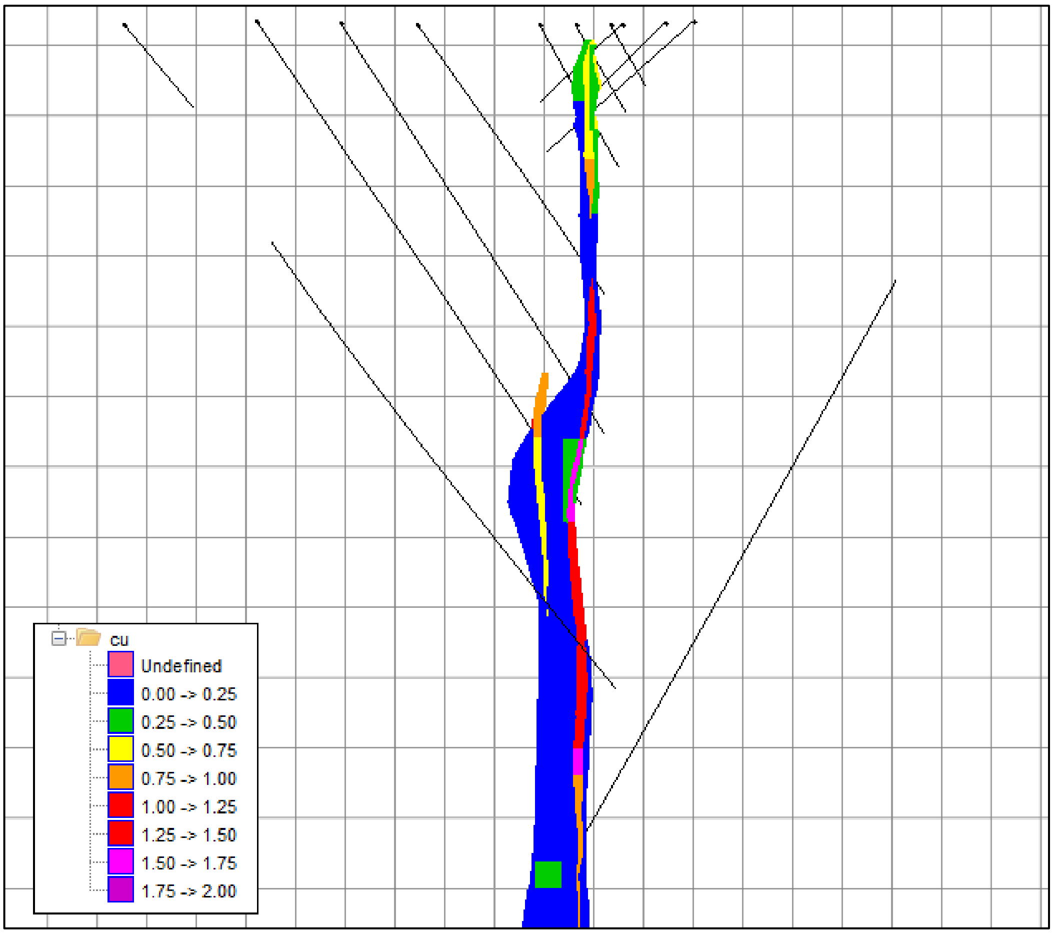


Figure 9.17. Oblique cross section 3 which locates in the middle of the D zone south shoot. Drillholes are shown in the black traces and block model as copper grade-coloured volumes. The grid is 50m x 50m and the deepest drillhole is Copperstone drilled hole VDD0206.

Figure 9.18. shows SW-NE longitudinal section over D zone showing estimated copper grade in the block model with 2016 scoping study mining designs. Image shows that there are several high-grade shoots in the block model running subvertical to steeply 65 degrees south plunging. As discussed in the previous sections, a steep southerly plunge is interpreted to correlate with feeder structure direction and copper estimation reflects current understanding well.

Figure 9.19 shows SW-NE longitudinal section with thickness variations in the D1 mineralisation. Thickness is true thickness which is calculated from the block model using horizontal planes. A similar clear trend of variations can be seen in the thickness than in the copper grade. Two thicker areas can be identified which are correlating with D zone north shoot and D zone south shoot. The thickest part of the mineralisation is partially correlating with the highest copper grade areas especially close to D zone north shoot southern border next to a possible feeder structure.

Figure 9.20 shows SW-NW longitudinal section with calculated copper metal contained in the D1 mineralisation. Copper metal is calculated by multiplying estimated copper grade with calculated true thickness of the ore body. Images are created and shown for illustrative purposes to highlight highest economical value parts of the deposit.

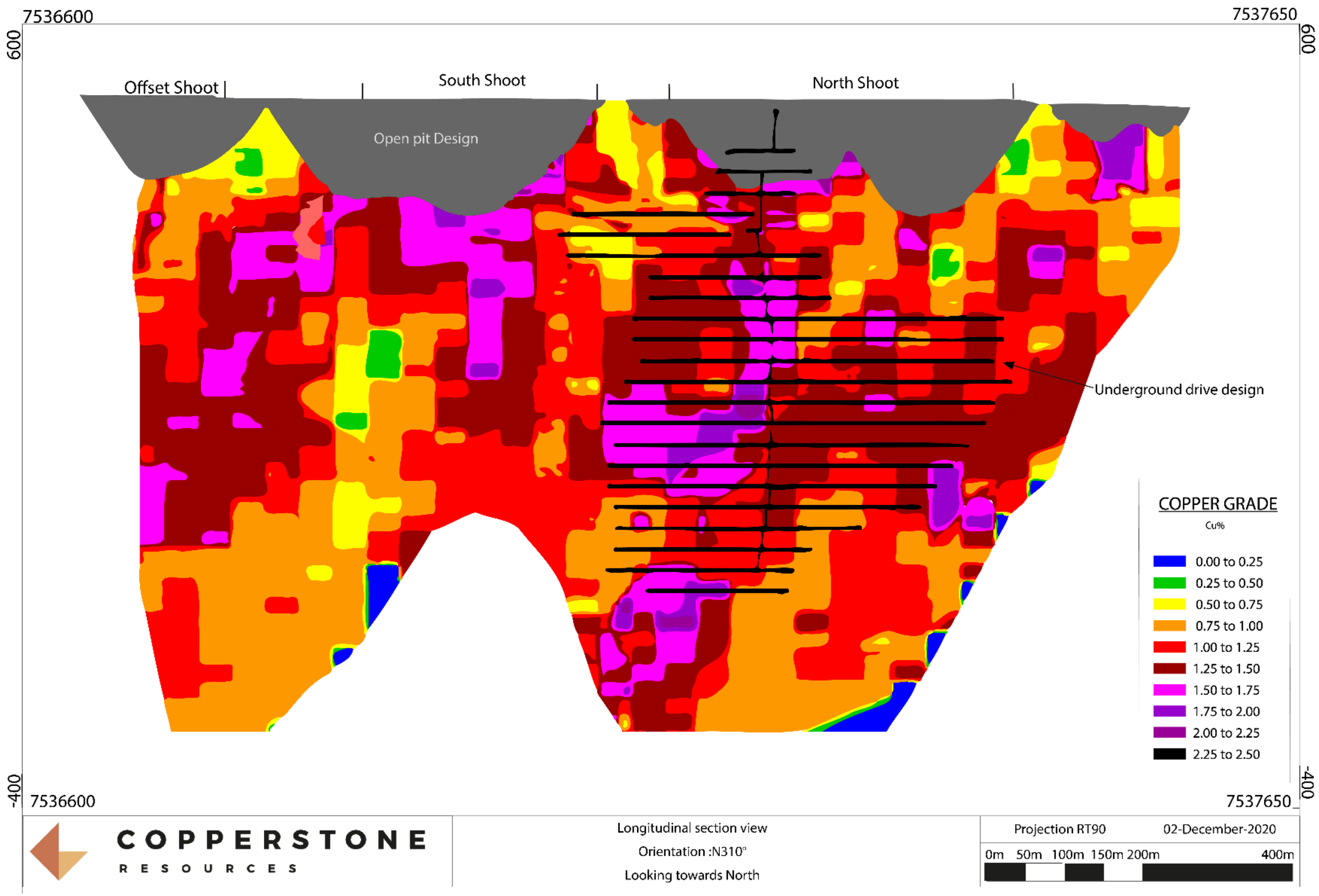


Figure 9.18. SW-NE longitudinal section over D zone showing estimated copper grade in the block model with 2016 scoping study mine design shapes

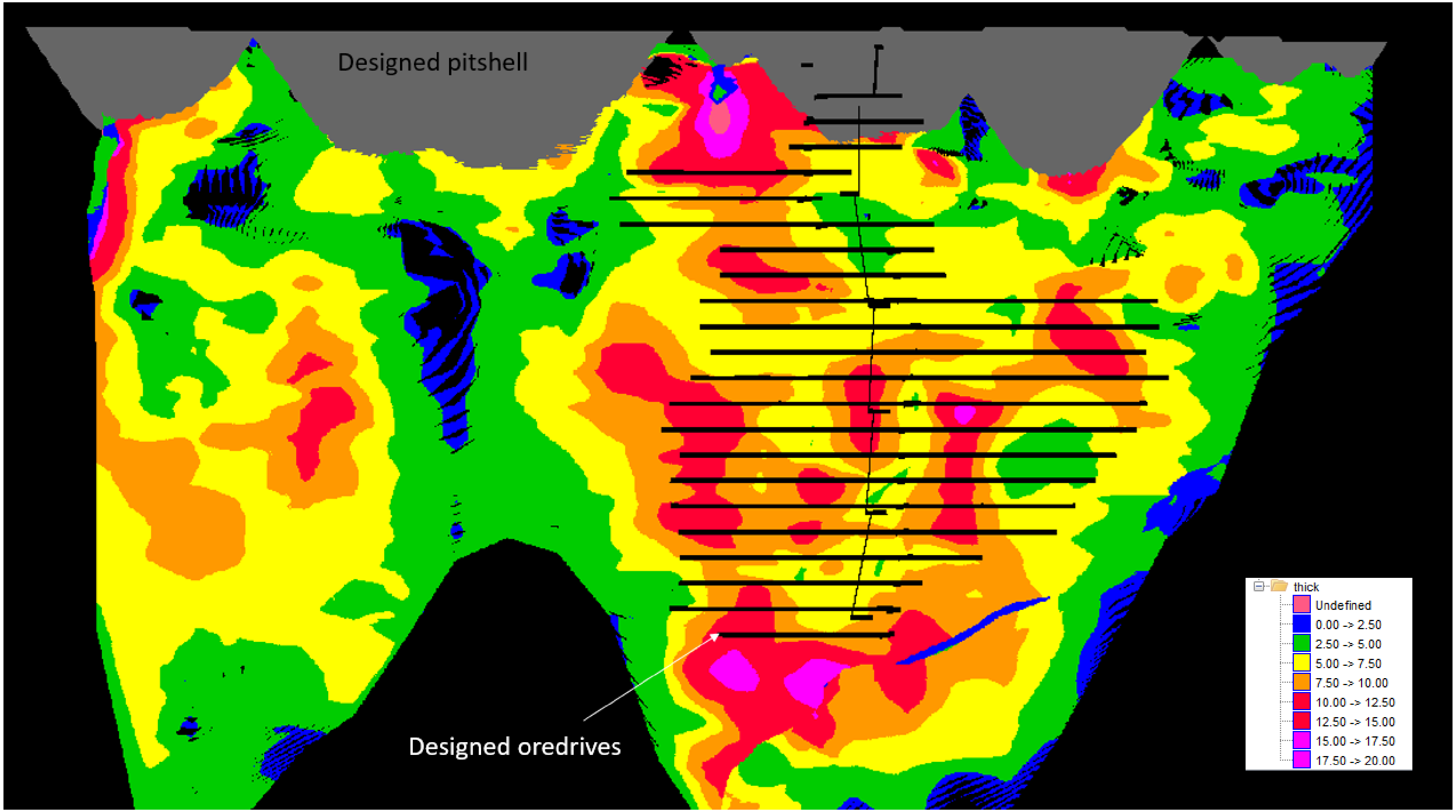


Figure 9.19 SW-NE longitudinal section with thickness variations in the D1 mineralisation with 2016 scoping study's mine design shapes.

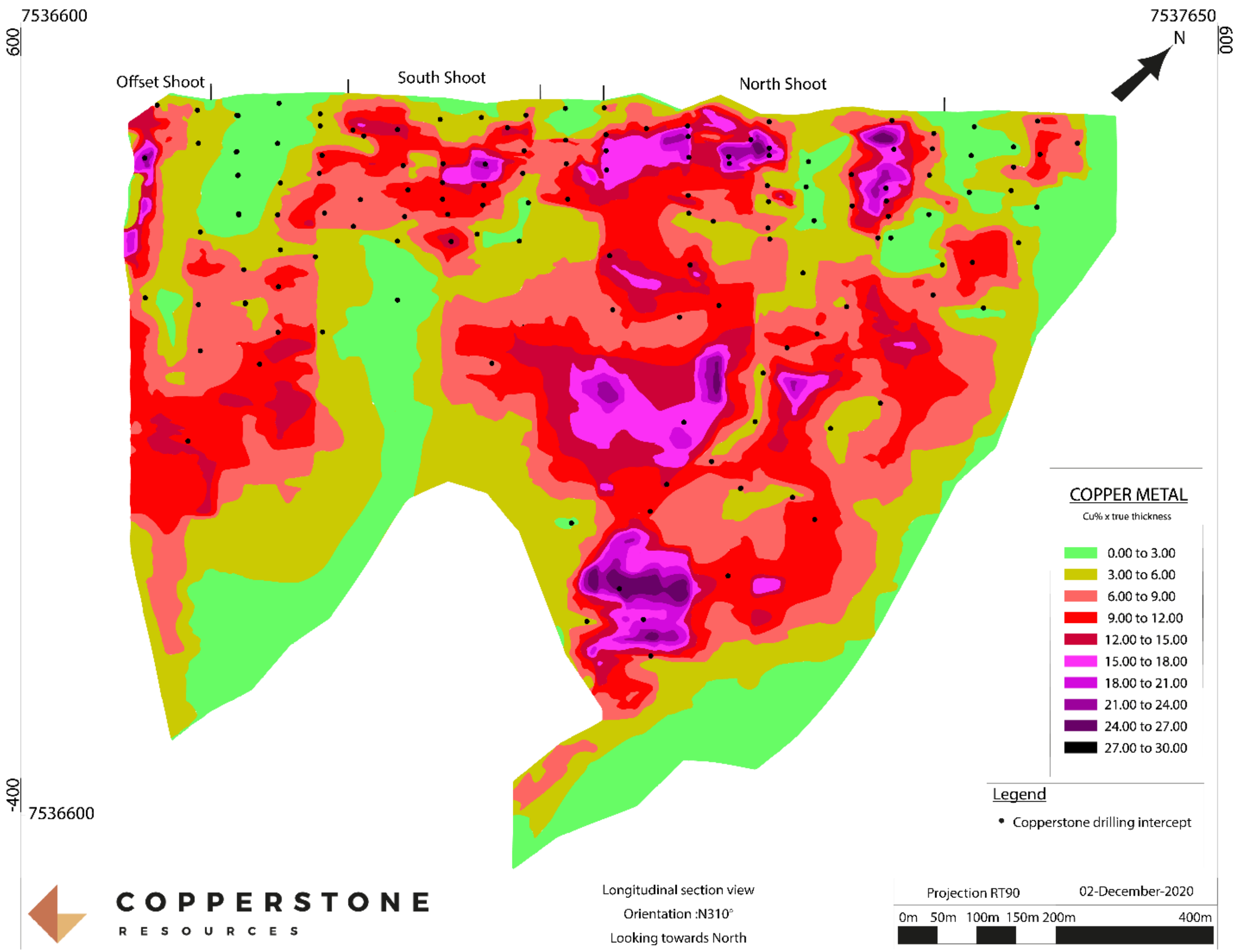


Figure 9.20 SW-NE longitudinal section with copper metal in the D1 mineralisation. Copper metal is calculated using true thickness of mineralisation calculated from the block model and multiplied by estimated copper grade

9.12 DENSITY ESTIMATION

Density is one of the most important parameters impacting mineral resource inventory. It impacts directly to reported tonnes and indirectly to average grades.

The Viscaria drillhole database contains 7382 bulk density measurements, of which 835 are from inside D1 copper mineralisation. Bulk density is measured using the Archimedes method, weighing mass in air and mass in water, allowing direct calculation of rock density. Density is measured in the drill core with a mean sample size of 60 cm. Density is measured throughout the whole intersections to ensure sample representativity.

There are enough density measurements to enable advanced calculations to maximize the accuracy of tonnes in the estimation. Density of the Viscaria D zone mineralisation was calculated using ordinary kriged estimation to estimate density directly for each block. This allows every block to have an individual density, which better reflects rock characteristics. Copper zones and magnetite-skarn have high density variability depending on the amount of magnetite. Therefore, estimating density is a better method than a single density per domain method.

Density was estimated with ordinary kriging, the same way as the metal grades. Samples were composited by 1 metre and domain coded. Density was analysed with geostatistics and modelled with directional variograms. Variography revealed similar characteristics for Cu, S, and Fe, so the same orientation was used. One global scale search neighbourhood pass was used for estimation. Ordinary kriged estimation for density was carried out using composited density data, directional variograms and search neighbourhood.

Figure 9.21 shows a histogram of bulk densities in the Viscaria copper mineralisation domains. The measurements range from 2.63 to 4.67, with a mean density of 3.41. The ranges and internal variations are higher than in other parts of the deposit, being primarily controlled by the amount of magnetite in the rock. Due to geostatistical characteristics one single density value per domain/rock type is not a sensible option.

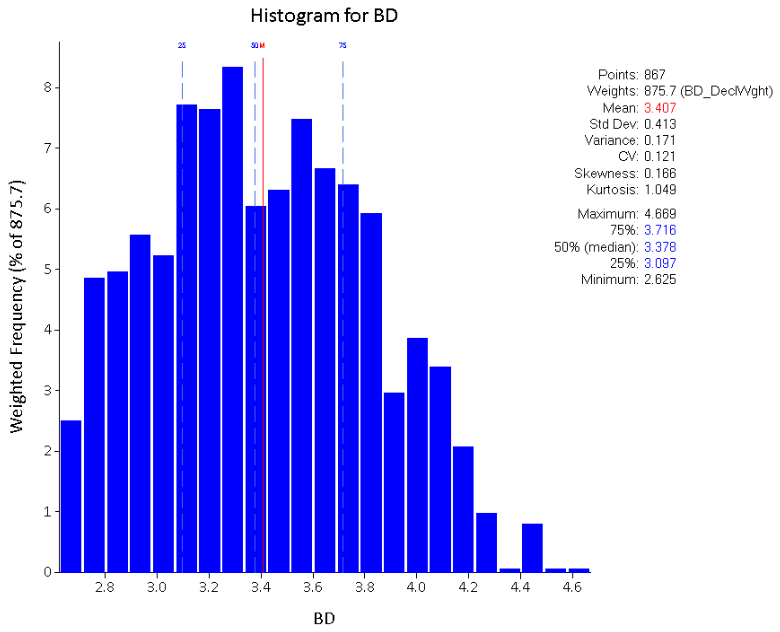


Figure 9.21. Bulk density of the copper mineralisations of Viscaria D zone.

Figure 9.22 shows a histogram of bulk densities in the magnetite skarn. Image shows similar range and variation of densities than in the copper mineralisations. The mean density is slightly lower than in copper mineralisations, averaging 3.17.

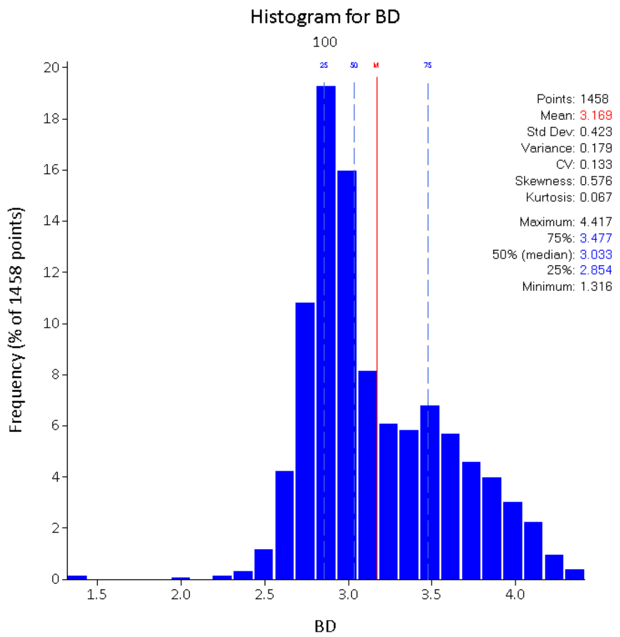


Figure 9.22. Bulk density of the magnetite skarn of Viscaria D zone.

Copper mineralisations and magnetite skarn have a significant amount of density measurements, allowing direct kriging of the blocks. However, other rock types have less data, preventing direct calculations. Densities of the rock types were analysed statistically and a representative mean grade was selected. Table 9.7 summarizes the strategy and selected densities for Viscaria.

Table 9.7. Summary of the modelled bulk densities.

Rock	Description	Density
Cu ore	Cu ore	OK estimation
100	Magnetite marble	OK estimation
200	Marble	2.76
300	Western breccia	2.95
400	Basalt	2.95
500	Metasedimentary rocks	2.86
600	Mafic sills	2.91

Two alternative density definitions were conducted to define accuracy and confidence of the density estimation. First alternative method was to define correlations of the density and assayed grades in the sample data. Copper and sulphur showed poor correlation to density indicating that sulphides are not controlling the density of the rock. Iron showed strong positive correlation with density. Polynomial regression of the iron and density was fitted with 0.86 correlation coefficient. Correlation between density and metal is excellent, which allows comparative calculation directly to the blocks by fitting polynomials. Block densities are calculated from estimated iron grades with polynomial regression (figure 9.23).

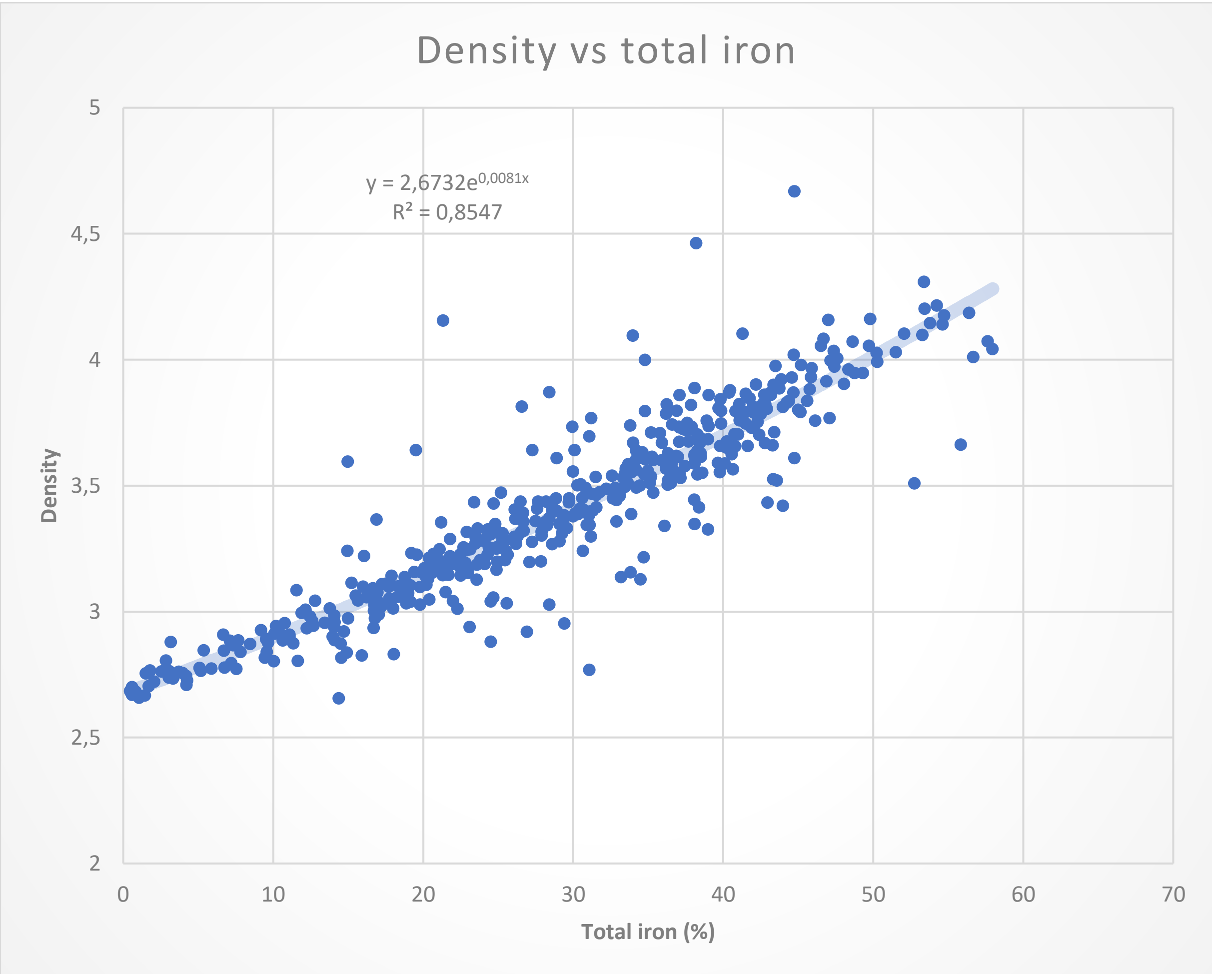


Figure 9.23 Scatter plot showing correlation between total iron content and density of the rock. Correlation of density to iron is excelelnt, allowing polynomial fitting as a comparative density calculation method.

The second alternative method to estimate block density was the classic method of selecting the mean value of a representative declustered sample population. Copper mineralisation density was defined as 3.4 which is the average for the copper mineralisation domains. It also matches the copper mineralisation density from the previous 2015 mineral resource estimate.

Mineral resource inventory tonnes were compared to two alternative method tonnes. Both check methods tonnes were inside expected variations, showing the robustness of the density estimation and increasing the confidence of the reported mineral resources.

9.13 MODEL VALIDATION

The accuracy of the model was confirmed with several steps of validation; visual, graphical, and statistical.

Interpretation and domain coding were validated visually to confirm that the mineral resource model respects the drillhole data and mineralisation shapes. Figure 9.24 shows example images of visual validation of the model. Presented cross sections are profiles 3, 14, and 18 locating to south, southern border of north shoot and northside of north shoot. Images show drillholes used in the estimation and magnetite skarn (blue outline), D1 (green outline), D2 (red outline) and d3 (yellow outline). Also, topography and base of the overburden is shown in brown.

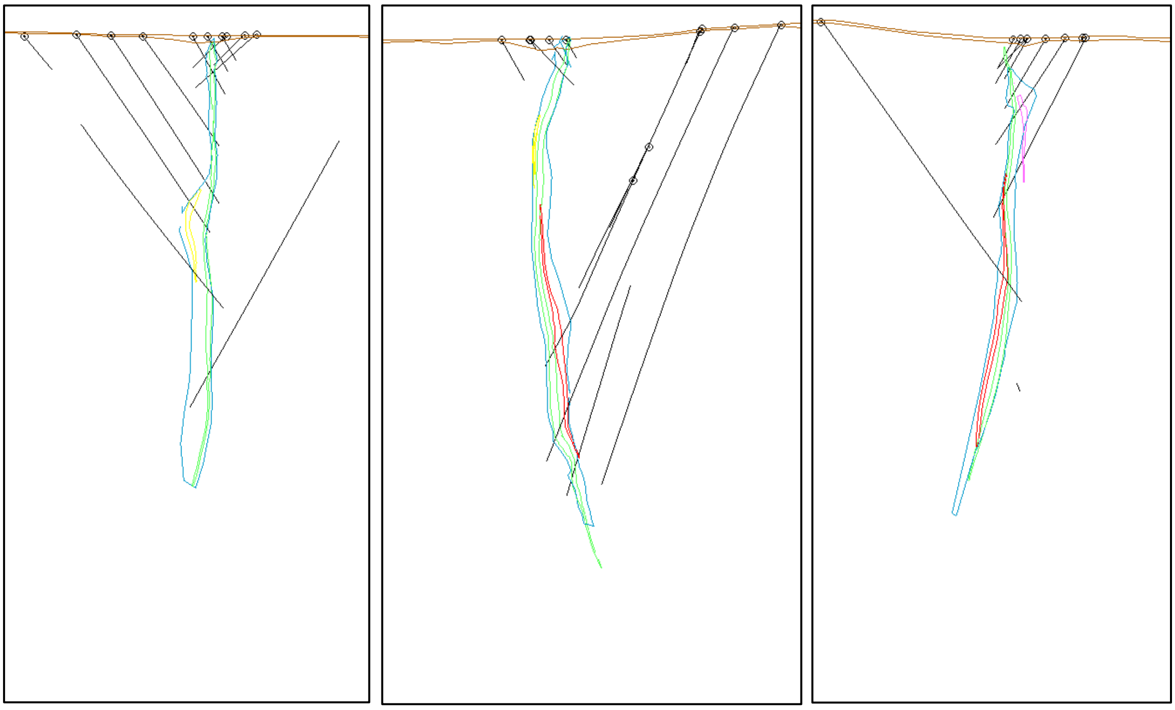


Figure 9.24 Profiles 3 (left), 14 (middle) and 19 (right). Images show drillholes used in the estimation and magnetite skarn (blue outline), D1 (green outline), D2 (red outline) and d3 (yellow outline). Also, topography and base of the overburden is shown in brown.

Volumes of block model was compared against interpreted 3D shapes to confirm appropriate filling of the block model. Table 9.8 shows comparison of the interpreted 3D volumes against the block model volumes. Variation is within the acceptable limits. Some minor differences may arise from the block modelling routine unable to fill thinner and unfavourably oriented positions correctly.

Table 9.8. Validation of the volumes.

3D interpretation solids				Block model		Difference	Commentary
Min	Validated	Status	Volume	Domain	Volume	%	%
D1	TRUE	solid	4,941,058	101	3,918,734	102%	D1 interpretation shape contain block model domain 101 and 111
D2	TRUE	solid	746,304	102	714,916	96%	Part of the D2 inside D1 wireframe
D3/1	TRUE	solid	206,848	103	427,305	97%	Block model domain is in two different interpretation solid
D3/2	TRUE	solid	231,813				
				111	1,141,356		
Total			***6,126,023***		***6,202,311***	***101%***	

Composited, declustered and topcut sample data was compared against calculated block model grades. It is expected that block model grades should match exactly composited, declustered and topcut sample data if no bias is introduced in the estimation process. Tables 9.9 and 9.10 show validation data for Cu and Fe, respectively. Sample vs block model grade for copper shows very good correlation for fresh rock domains (101, 102, 103 and 111). Oxidised domains (161 and 171) show a bias that is greater than normal. This is caused by a limited number of samples and a soft-soft boundary approach between domains. Validation check for Fe shows slightly larger amount of variance compared to Cu. However, results are inside acceptable variance.

Table 9.9. Validation check sample data vs block model grade for Cu.

	Model		Samples		Difference	
Domain	Tonnes	Cu (%)	Samples	Cu (%)	Absolute	%
101	12,878,535	1.18	664	1.18	-0.01	-1%
102	2,428,123	1.40	154	1.46	-0.06	-4%
103	1,454,775	1.09	150	1.10	-0.01	-1%
111	2,193,789	1.23	405	1.18	0.05	4%
161	468,636	1.11	21	0.79	0.32	41%
171	1,377,565	1.20	237	1.33	-0.12	-9%

Table 9.10. Validation check sample data vs block model grade for Fe

	Model		Samples		Difference	
Domain	Tonnes	Fe (%)	Samples	Fe (%)	Absolute	%
101	12,878,535	27.32	663	27.71	-0.38	-1%
102	2,428,123	26.39	154	28.37	-1.98	-7%
103	1,454,775	31.54	148	29.98	1.56	5%
111	2,193,789	29.16	403	28.44	0.73	3%
161	468,636	18.61	21	20.23	-1.62	-8%
171	1,377,565	22.65	232	22.05	0.59	3%

Swath plots were created for all the domains against Cu, Fe, and S. These plots compare average copper grades between composited drill hole data and block model along northing and elevation trends. From these plots can be determined if there are problems geographically and if the grade estimation is too smooth. The correlation between the composited drill hole grades and the OK estimated block model grade is strong. The greatest differences are in the domains which are poorly sampled and where there is local variance. There is no systematic bias evident from the plots and the smoothing introduced by OK is evident.

Figure 9.25 shows a Swath plot of copper as a function of northing. Sample grades are plotted in blue and model grades in red. Domains 101, 102, 103 and 111 are shown. The graph shows relatively strong correlation between the two datasets. The main differences are northing 7536 920mN in the domain 101 and 7537 120mN in the domain 111. The difference in 101 is explained by the amount of inferred resources in the plot profile. The swath plot algorithm does not use declustering which introduces bias when large amount of the inferred resource with different grade is reported. In this profile inferred resources are significantly lower grade than shallow mineralisation, causing bias in the swath plot. Explanation for 111 difference is the location of the feeder structure. The block model reflects more accurately current interpretation of lower grades in the southern side of the feeder than sample data.

Figure 9.26 shows a Swath plot of copper as a function of elevation. Sample grades are plotted in blue and model grades in red. Domains 101, 102, 103 and 111 are shown. Graph shows relatively good correlation between two datasets. Main differences can be located to places where amount of the composites is very low (<10).

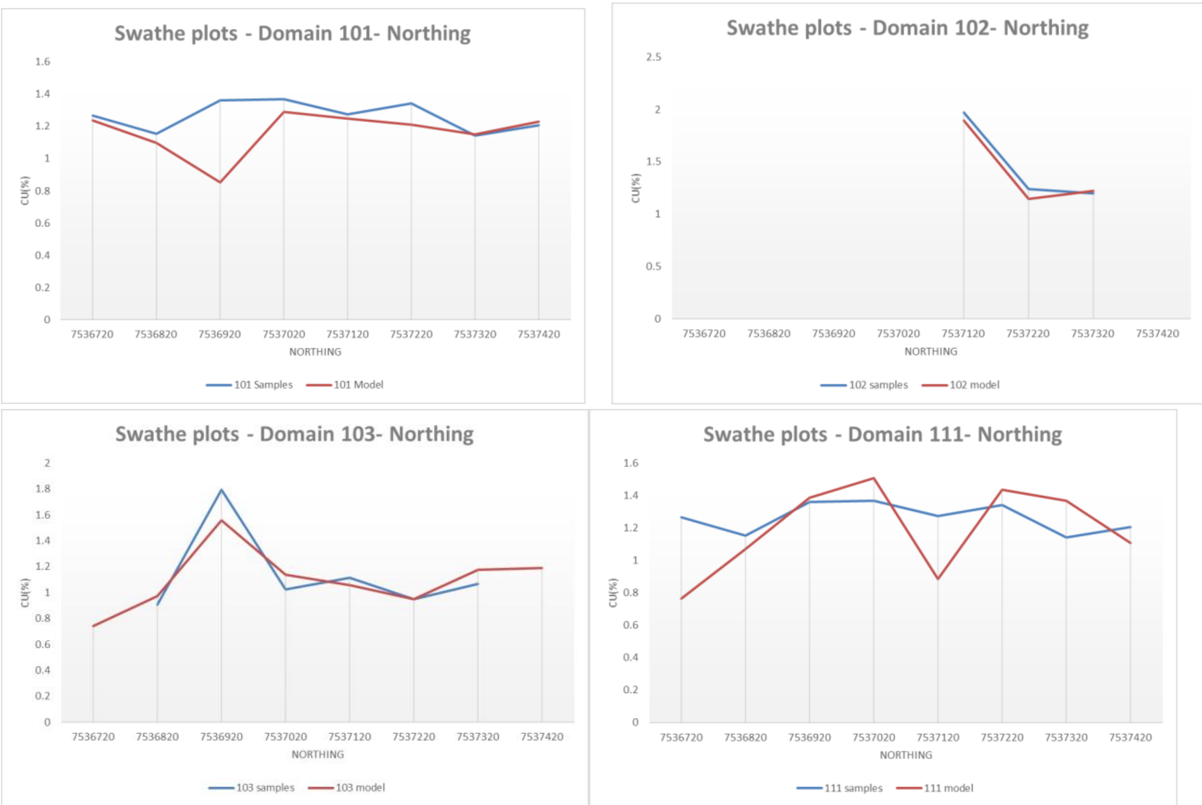


Figure 9.25. Swathe plots Cu(%) vs northing showing sample grades in blue and model grades in red.

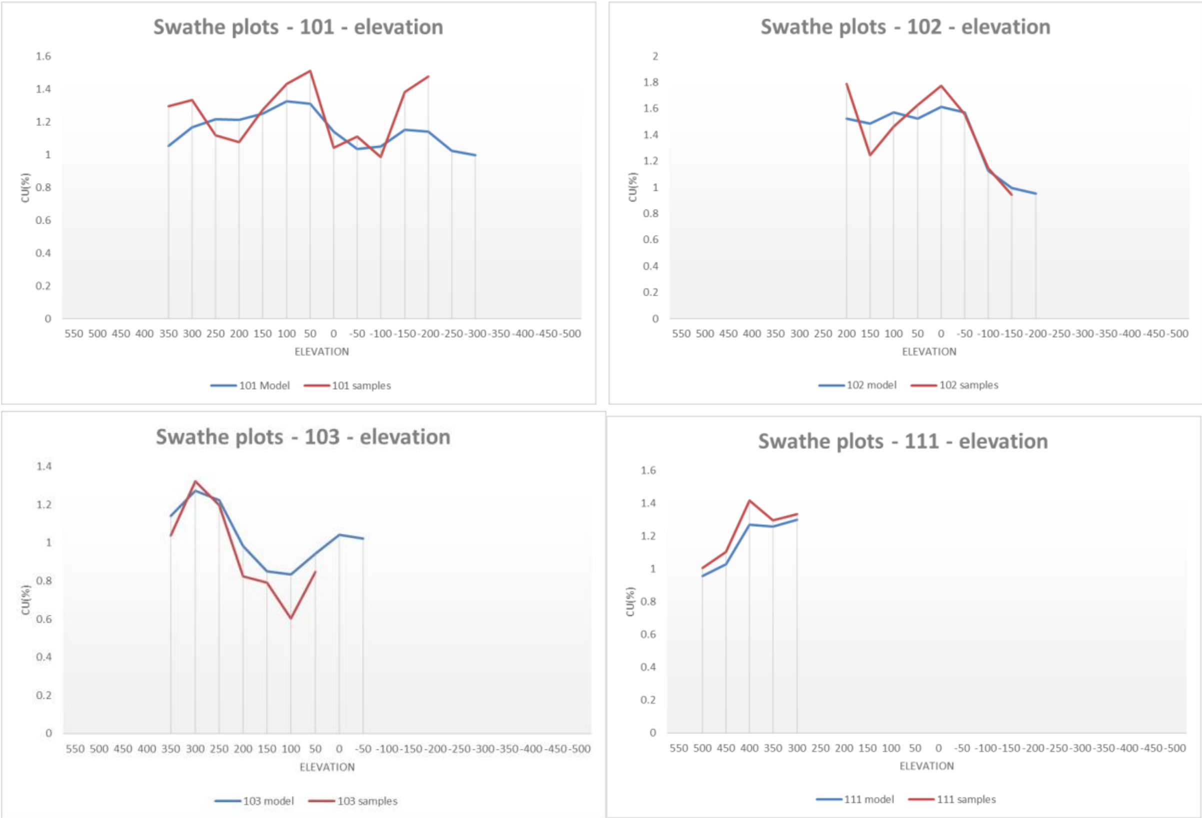


Figure 9.26. Swath plots Cu(%) vs elevations showing sample grades in red and model grades in blue.

Two alternative estimations were carried out to evaluate accuracy of the mineral resource calculations and to increase confidence in the new mineral resource inventory. Chosen methods were inverse distance and simple kriging.

Inverse distance was selected due to simple and quick execution of the calculations. It is also a rather common method. With inverse distance, the block grade is estimated by weighing samples by distance to the block. Inverse distance power was chosen to two (weight of composite is 1/(delta distance * delta distance)). A limitation of the ID estimation method is that it produces a rather local estimation, especially when drill spacing is sparse as weighing decreases exponentially.

Simple kriging is a more rarely used method. It was selected as an alternative estimation method as it is designed for the deposits that struggle to reach high estimation qualities. Viscaria D zone estimation quality was not top class and simple kriging is a valid check method for the deposit. Simple kriging resembles ordinary kriging approach but introduces the global mean grade of the domain to the estimation. Block grade estimate is adjusted towards the global mean for poor estimation qualities, creating confidence in the estimation in the sparser drilling areas.

Figure 9.27. shows comparison of the ordinary kriged estimation method versus two alternative methods. All methods have roughly similar tonnes and grade at 0% Cu cut-off. Inverse distance shows largest selectivity as expected. Simple kriging shows smoothest behaviour and least selectivity. This is also as expected. Ordinary kriging locates almost in the middle of the two alternative estimation methods. This indicates that OK has successfully introduced global estimation performance with higher confidence but kept part of the local estimation selectivity.

Alternative estimations show that ordinary kriging is a good compromise between the two methods. Alternative estimations and grade-tonnage comparisons were completed September 2020 and therefore there are minor differences in the numbers compared to final resource statement completed November 2020.

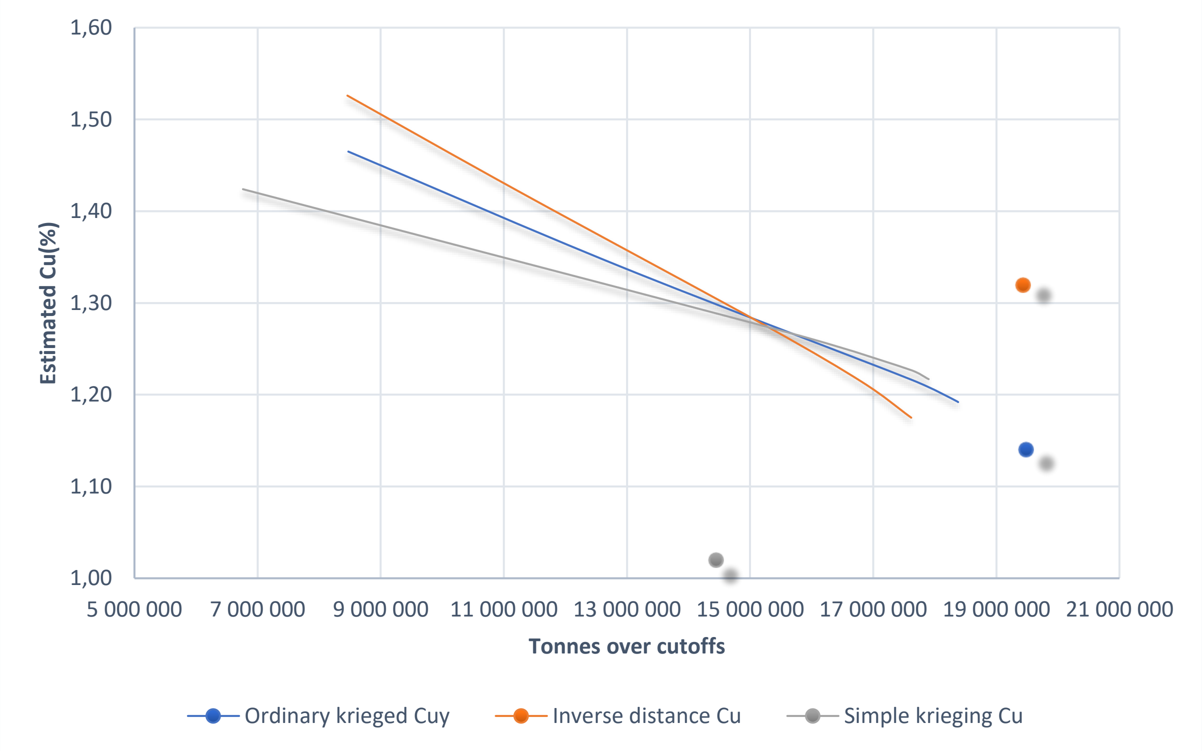


Figure 9.27. Grade tonnage curve comparison of three different estimation methods

9.14 RESOURCE CLASSIFICATION

PERC standard mineral resource inventory classifications were followed by defining the resource confidence. The resource was split to three confidence classes – measured, indicated, and inferred. Figure 9.28 shows PERC standard guideline which was followed in classification.

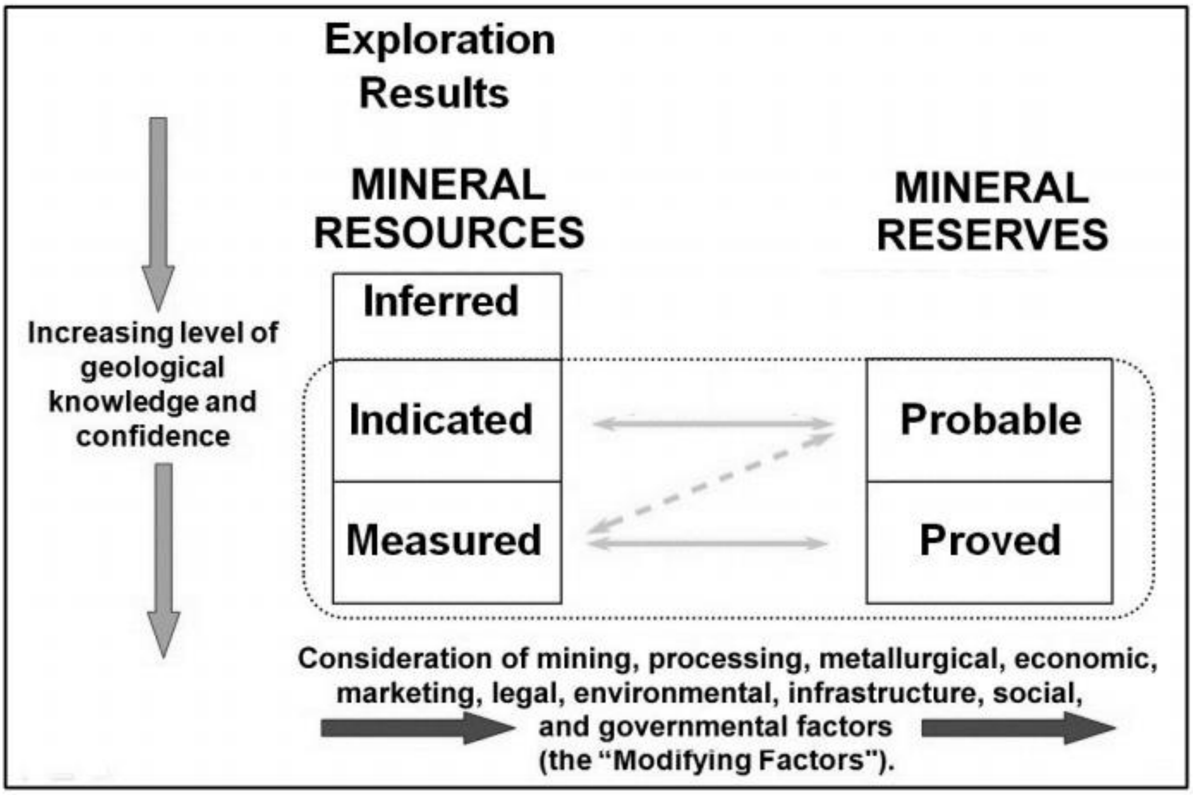


Figure 9.28. PERC standard guideline for resource classification.

Resources were classified into measured, indicated, and inferred resource categories considering drillhole spacing, grade continuity, geological and structural knowledge, variography, estimation quality and search neighbourhood parameters. Following criteria were considered:

- Measured resources were not defined at D zone. Because the inter-laboratory checks of 2015 show a positive bias, no part of D Zone can be classified as Measured. Once this bias is resolved, parts of D Zone will be upgraded to Measured status with no further work needed.
- Indicated resources were defined in the areas where density of drilling density is minimum 50m x 50m, grade estimation is interpolated and estimations are mainly from the local first round of search. D zone deep north includes minor areas with wider spacing of drilling up to 80 m x 80 m which was included to indicated category with high geological and structural continuity. The area is also estimated in the local first round of the search and it is estimated using minimum 75% of the samples allowed by search neighbourhood.
- Inferred resources are defined in the area where drilling is less than 50 m x 50 m, including interpolations and extrapolations. A maximum of 100 metres extrapolation is included to the inferred resources. Extrapolation distance is less than the range of the directional variograms.
- Areas outside 100 m extrapolation have been removed from the Mineral Resource Inventory. These areas are classified as having exploration potential.

Table 9.11 summarizes resource classification used in the resource estimation.

Competent Person opinion is that mineral resource inventory categories reflect data spacing and deposit style characteristics and is sufficient for used classification. The lower part of the indicated resources is less confident and requires further drilling for the feasibility study. Inferred resources are conservatively defined with potential for upgrade.

Table 9.11. Summary of the resource classification

Code	***Rescat***	***Descriptions***	***Solid***
1	Measured	No measured resources	
2	Indicated	Overall densely drilled part of the deposit. Typically 50mx50m drilling. Deepest part locally sparser with additional support for grade continuity from shallower areas	vscd_ind.dtm
3	Inferred	Resources defined by drilling. Typically drilled about 100 meter sections.	vscd_inf.dtm
4	Potential	Unrealistic extensions	

Figure 9.29 shows longitudinal view showing resource classification and composites in the estimation. Blue colour shows indicated resources and green colour shows inferred resources. Black dots are sample composites used in the estimation. Resource classification is defined using 3D classification shapes and cookie cutting shapes for blocks.

Exploration potential areas have been cut/deleted from the resource classification. Some images of this report show large extrapolations. These areas have been removed in the resource classification phase following PERC standard guidelines.

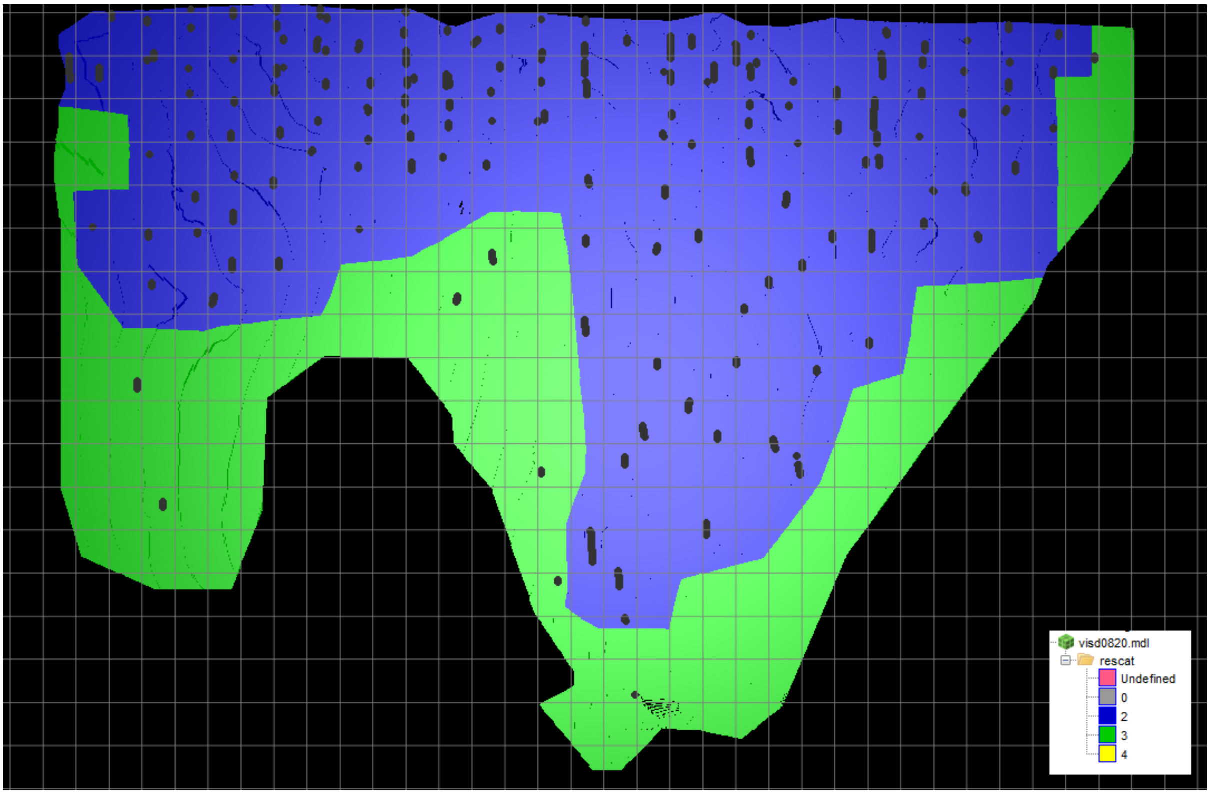


Figure 9.29. Longitudinal view showing resource classification and composites in the estimation. Blue colour shows indicated resources and green colour shows inferred resources. Black dots are sample composites used in the estimation.

9.15 GRADE TONNAGE CURVES

Grade-tonnage curves were created for copper using 0.1% Cu cutoffs. Grade and tonnage were reported using all copper domains and in was split to three scenarios – all copper resources, all open pit resources and all underground resources. Figures 9.30, 9.31 and 9.32 shows grade tonnage curves for different scenarios.

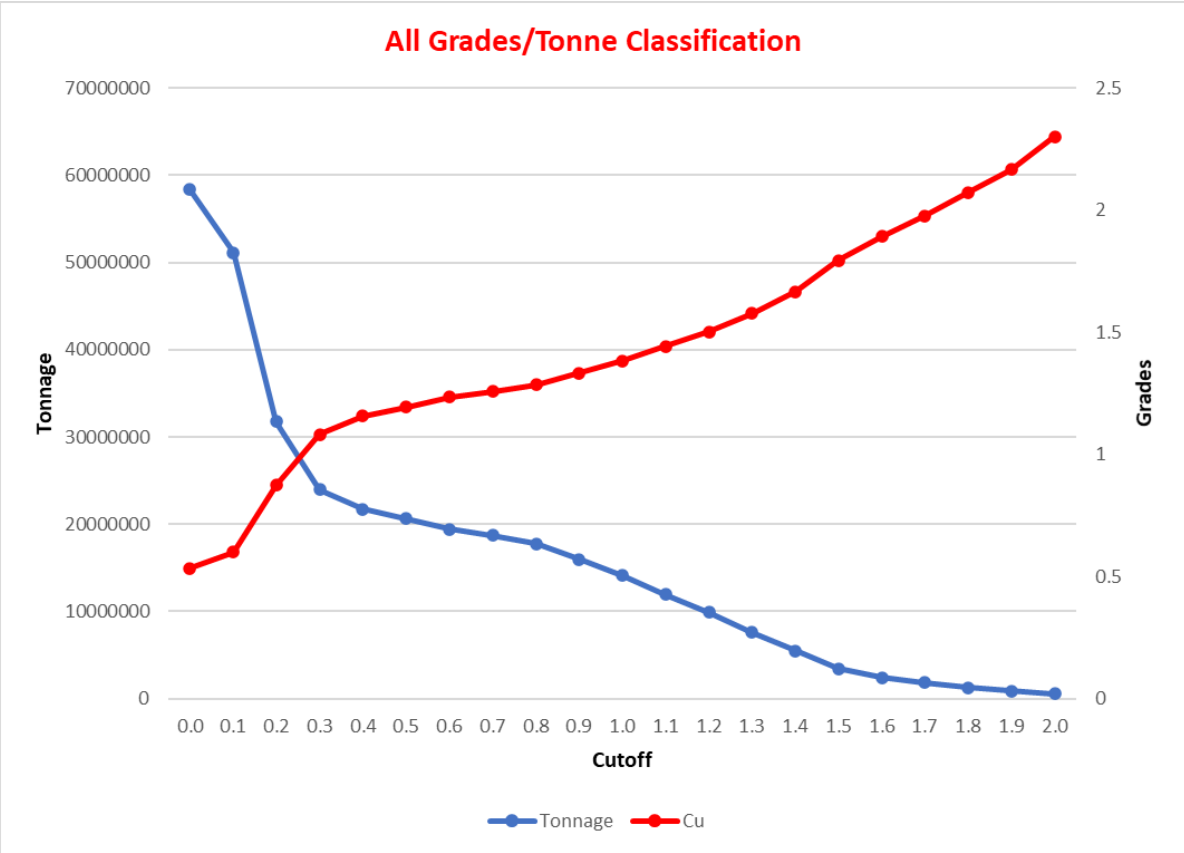


Figure 9.30. Grade tonnage curve of all mineral resources of all cu domains.

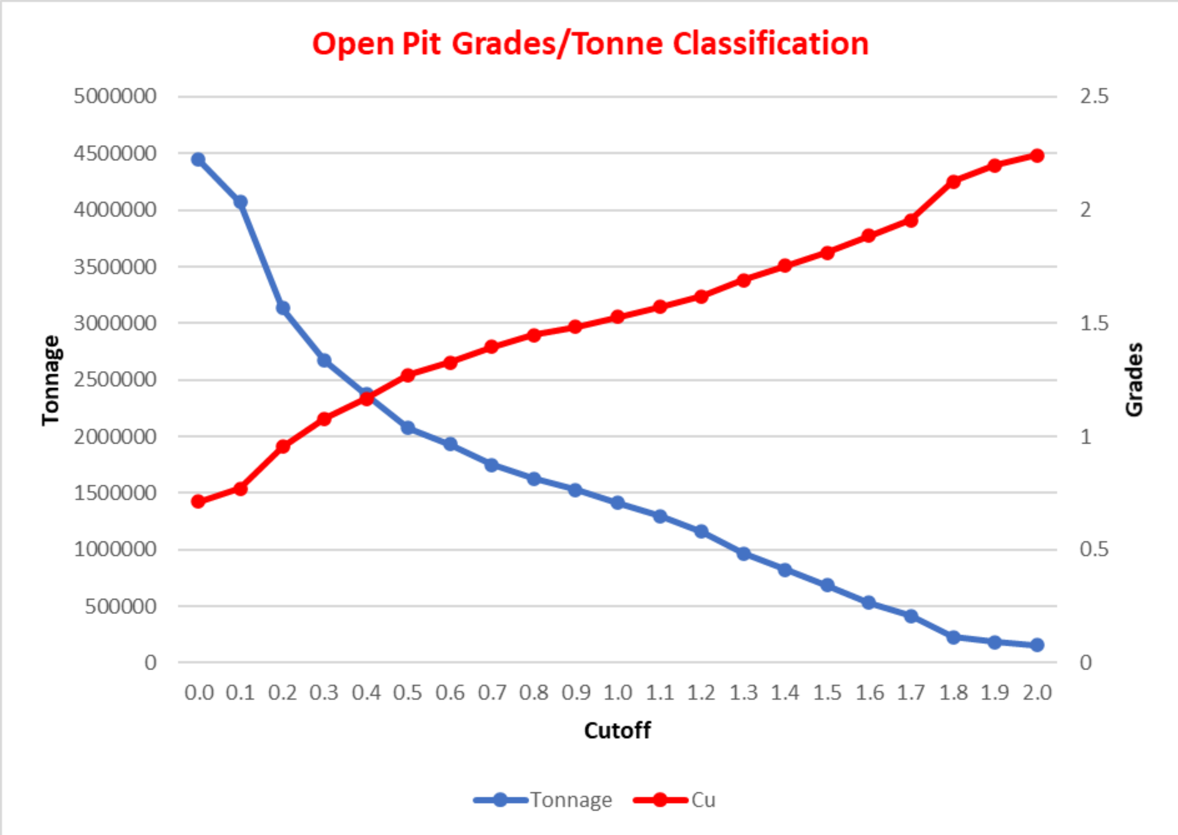


Figure 9.31. Grade tonnage curve of open pit mineral resources of all cu domains.

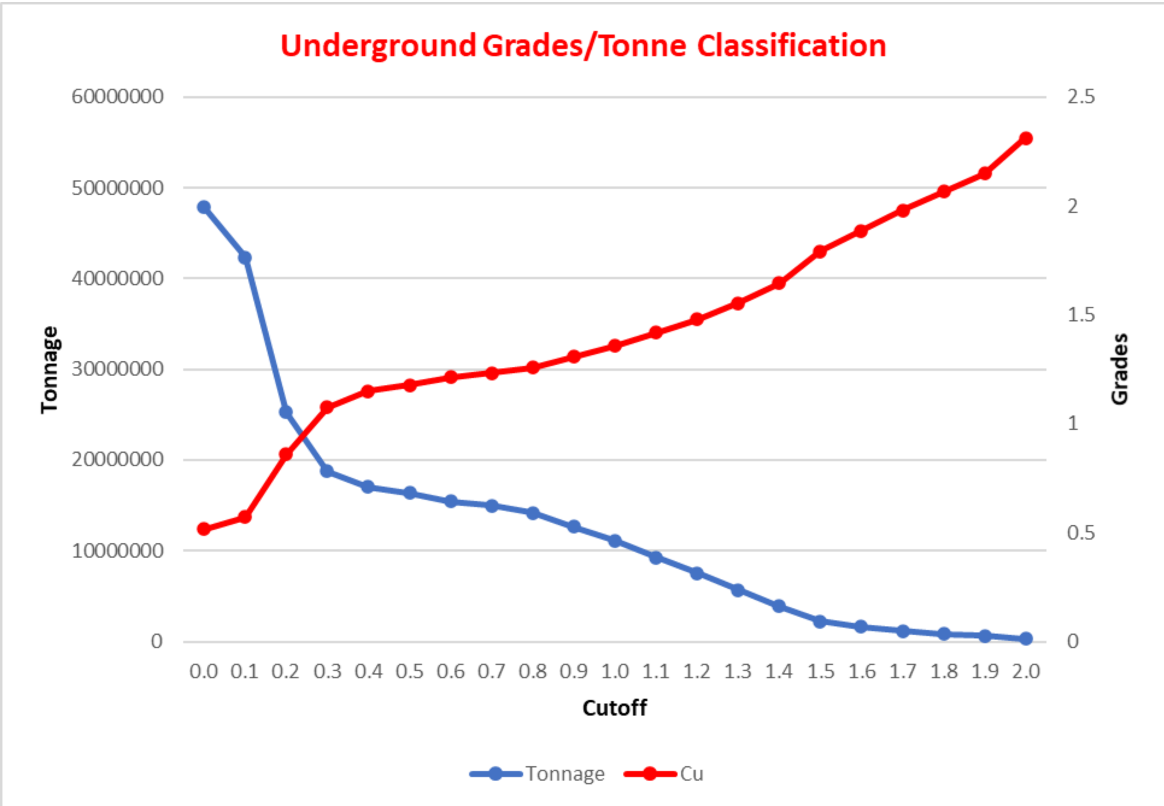


Figure 9.32. Grade tonnage curve of underground mineral resources of all cu domains.

Grade-tonnage curves were created for iron using 1% fe cutoffs from 15-20% iron cutoffs to show sensitivity of iron for the cutoffs.. Grade and tonnage were reported using all iron domain (excluding copper domain) and in was split to three scenarios – all copper resources, all open pit resources and all underground resources. Figures 9.33, 9.34 and 9.35 shows grade tonnage curves for different scenarios.

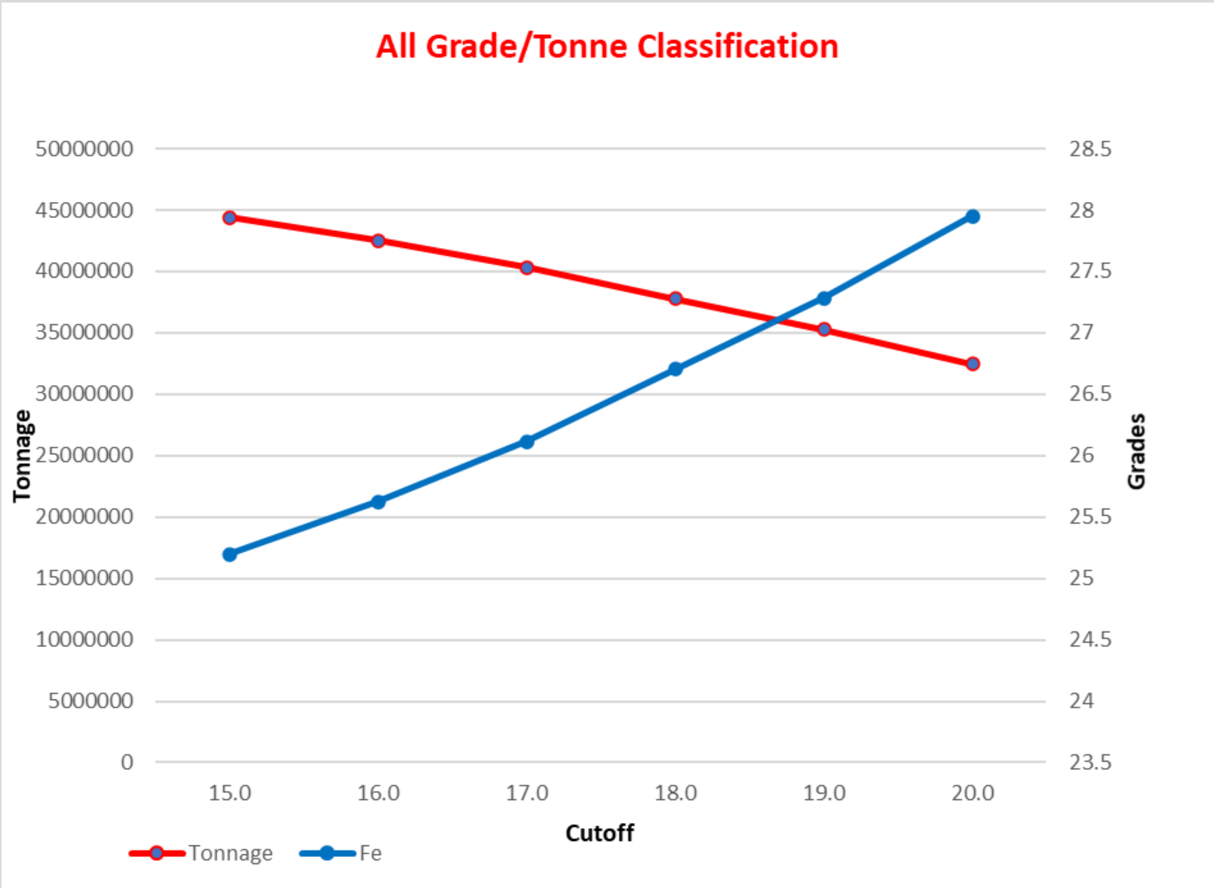


Figure 9.33. Grade tonnage curve of all mineral resources of all fe domains.

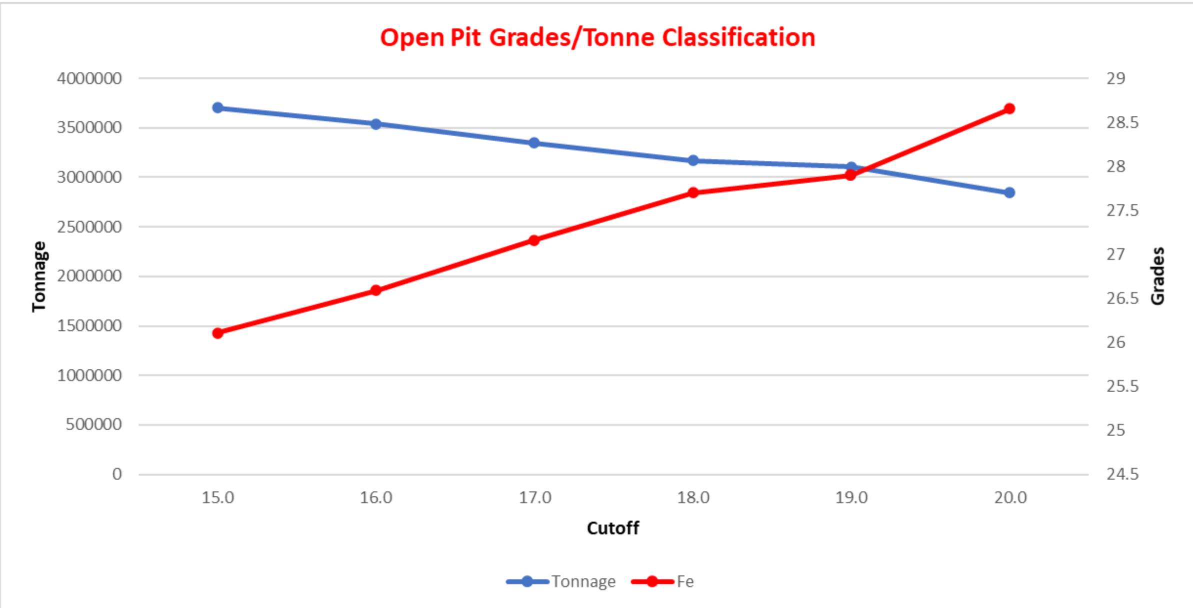


Figure 9.34. Grade tonnage curve of open pit mineral resources of all fe domains.

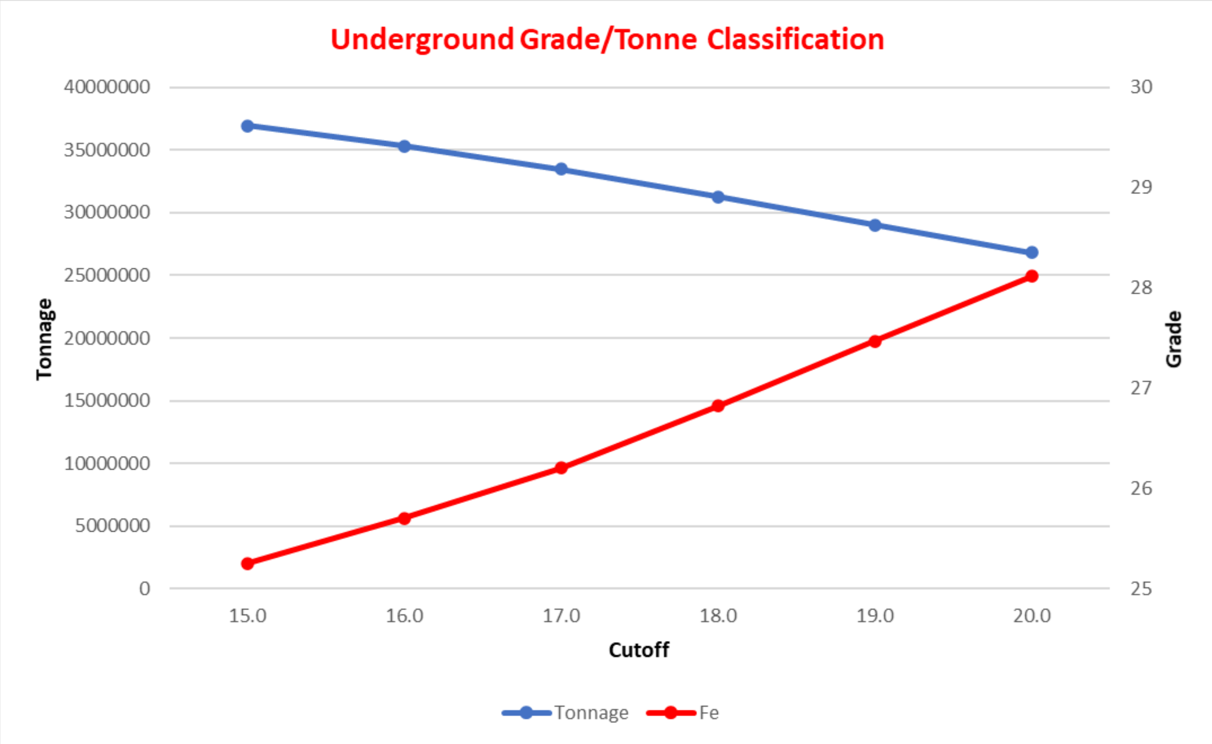


Figure 9.35. Grade tonnage curve of underground mineral resources of all fe domains.

9.16 MINERAL RESOURCE STATEMENT

The Resource estimate for D Zone Copper domains is 19.76 Mt @ 1.22% Cu, 27.87% Fe and 1.34% S producing 241,0 kt of contained copper metal and 5508.3 kt of iron metal. Iron grade and iron metal is calculated and reported as total iron which is different from magnetite iron. The Resource estimate for D Zone is presented in Table 9.12.

The Resource estimate for D Zone Iron domain is 31.38 Mt @ 0.21% Cu, 19.03% Fe and 0.32% S producing 65,4 kt of contained copper metal and 5977.8 kt of iron metal. Iron grade and iron metal is calculated and reported as total iron which is different from magnetite iron. The Resource estimate for D Zone is presented in Table 9.13.

Table 9.12. Mineral resource statement Cu domains.

Rescat	Domain	Tonnes	Cu (%)	Fe (%)	S (%)	Cu metal (kt)	Fe metal (kt)
Indicated	Cu domains	14,365,908	1.25	27.38	1.33	179.6	3,933.2
Inferred	Cu domains	5,395,181	1.14	29.19	1.38	61.5	1,575.1
M+I+I	***Total***	***19,761,089***	***1.22***	***27.88***	***1.34***	***241.0***	***5,508.3***

Table 9.13. Mineral resource statement of Fe domain outside Cu domains. Iron resources are not included in the copper reporting.

Rescat	Domain	Tonnes	Cu	Fe	S	Cu metal (kt)	Fe metal (kt)
Indicated	Iron domain	25,287,939	0.20	19.17	0.31	50.8	4,847
Inferred	Iron domain	13,278,475	0.15	17.32	0.28	19.8	2,300
All	***Total***	***38,566,413***	***0.18***	***18.53***	***0.30***	***70.6***	***7,147***

9.16.1 MINERAL RESOURCE STATEMENT WITH CUTOFFS

Copperstone resources report mineral resources using cutoffs 0.8%Cu for copper domains and 20%Fe for iron domains. Cutoffs are chosen based on the mining modifying factor and economics.

The Resource estimate for D Zone Copper domains is 17.77 Mt @ 1.29% Cu, 28.44% Fe and 1.43% S producing 228,7 kt of contained copper metal and 5036 kt of iron metal. Iron grade and iron metal is calculated and reported as total iron which is different from magnetite iron. The Resource estimate for D Zone is presented in Table 9.14.

The Resource estimate for D Zone Iron domain is 15.07 Mt @ 0.19% Cu, 26.21% Fe and 0.30% S producing 28,0 kt of contained copper metal and 3951kt of iron metal. Iron grade and iron metal is calculated and reported as total iron which is different from magnetite iron. The Resource estimate for D Zone is presented in Table 9.15.

Table 9.14. Mineral resource statement Cu domains reported above 0.8% Cu cutoff.

Rescat	Domain	Tonnes	Cu (%)	Fe (%)	S (%)	Cu metal (kt)	Fe metal (kt)
Indicated	Cu domains	12,772,909	1.33	28.07	1.43	169.5	3,585
Inferred	Cu domains	4,932,685	1.18	29.41	1.43	58.2	1,451
M+I+I	***Total***	***17,705,594***	***1.29***	***28.44***	***1.43***	***228.7***	***5,036***

Table 9.15. Mineral resource statement of Fe domain outside Cu domains. Iron resources are not included in the copper reporting.

Rescat	Domain	Tonnes	Cu	Fe	S	Cu metal (kt)	Fe metal (kt)
Indicated	Iron domain	10,949,018	0.20	25.76	0.30	21.9	2,821
Inferred	Iron domain	4,123,598	0.15	27.40	0.30	6.1	1,130
All	***Total***	***15,072,616***	***0.19***	***26.21***	***0.30***	***28.0***	***3,951***

9.16.2 MINERAL RESOURCE STATEMENT IN MINING AREAS

Copperstone resources reports mineral resources using 2016 scoping study open pit shape. Open pit has been designed using set of parameters related on the modification factors (mining, processing and terms) and economical factors. Mineral resource inventory is split for open pit resources (inside pit shell) and underground resources (outside pit shell). Mineral resources inside pit shell are reported using 0.2% Cu cutoff and underground resources are reported using 0.8% Cu cutoff. Both are reported with Cu domains only.

Table 9.16. Mineral resource statement Cu domains reported inside 2016 scoping study pit shell using 0.2% Cu cutoff. Inventory reported as open pit resources.

Rescat	Domain	Tonnes	Cu (%)	Fe (%)	S (%)	Cu metal (kt)	Fe metal (kt)
Indicated	Cu domains	1,853,323	1.34	28.39	0.78	24.8	526
Inferred	Cu domains	2,355	0.80	13.13	0.12	0.0	0
M+I+I	***Total***	***1,855,678***	***1.34***	***28.37***	***0.77***	***24.8***	***526***

Table 9.17. Mineral resource statement of Cu domains outside 2016 scoping study pit shell using 0.8% Cu cutoff. Inventory reported as underground resources.

Rescat	Domain	Tonnes	Cu	Fe	S	Cu metal (kt)	Fe metal (kt)
Indicated	Cu domains	9,856,819	1.30	28.36	1.52	128.1	2,795
Inferred	Cu domains	4,296,939	1.17	30.21	1.42	50.2	1,298
All	***Total***	***14,153,757***	***1.26***	***28.92***	***1.49***	***178.3***	***4,093***

Complete scoping study for Viscaria was completed April 2016. Study included open pit and underground mining designs and processing designs with required level of study of processing metallurgy. Other aspects including geotechnical study, site infrastructure designs, project execution and capital cost and operating cost were analysed in the scoping study level accuracy. No major changes to main parameters nor mineral resource inventory has been identified. Mineral resource inventory reports similar grades with higher tonnage. Therefore RPEEE (reasonable prospect for eventual economical extraction) can be assumed based on the previous scoping study.

No new open pit optimization or underground mine designs has been completed for this mineral resource inventory.

9.16 COMPARISON FOR PREVIOUS ESTIMATE

Previous Mineral Resource Inventory is dated November 2015. Interpretation of the copper mineralisations and hosting magnetite skarn package remains similar in the new estimation. Estimation parameters has been modified based on the new information. 15 new drillholes has been drilled with totalling 10 200 metres. Total metres of drilling in the D zone has increased by 25% since the previous model. Most of the drillholes have been extensional exploration drilling with aim to increase the resource base. Few of the holes were drilled inside 2015 mineral resource boundary to infill existing mineral resources.

Table 9.18 shows mineral resource comparison against previous model in the measured, indicated and inferred categories. Comparison is done in the copper domains. New model shows significant increase of tonnes (44%) with slight increase of the copper grade (3%) totalling significant increase of copper metal (48%). Total iron calculation was included to new model and no comparison can be done as total iron was not reported in the previous model.

Table 9.19. Comparison of new resource estimation against previous. Mineral resource inventory comparison of copper domains. Measured+indicated resource classification.

Model	Rescat	Tonnes	Cu (%)	Fe (%)	Cu metal (kt)	Fe metal (kt)
Nov-15	M+I+I	11,130,000	1.23	-	137.7	-
Nov-20	M+I+I	16,020,00	1.27	28.8	203.3	4,620
Difference		***44%***	***3%***	***NA***	***48%***	***NA***

Table 9.20 shows mineral resource comparison against previous model in the measured and indicated categories. Comparison is done in the copper domains. New model shows increase of tonnes (13%) with significant increase of the copper grade (9%) totalling significant increase of copper metal (22%). Total iron calculation was included to new model and no comparison can be done.

Table 9.20. Comparison of new resource estimation against previous. Mineral resource inventory comparison of copper domains. Measured+indicated+inferred resource classification.

Model	Rescat	Tonnes	Cu (%)	Fe (%)	Cu metal (kt)	Fe metal (kt)
Nov-15	M+I	10,370,000	1.20	-	125.0	-
Nov-20	M+I	11,710,000	1.31	28.4	153.0	3,321
Difference		***13%***	***9%***	***NA***	***22%***	***NA***

APPENDIX 1: TABLE 1 - CHECK LIST OF ASSESSMENT AND REPORTING CRITERIA

Perc standard 2017 table 1 was used as a check list for minimum requirement. Full copy of table 1 with commentary explanation is provided as an attachment for the report. Items in the check list are discussed in more detail in the report and relevant supporting info including images, tables and graphs is delivered in the report.

Table 1 Part 1 - General

Criteria	PERC Code explanation	Commentary
Purpose of Report	• (i) The report should include a title page and Table of Contents, including figures and tables. (ii)State for whom the report was prepared, whether it was intended as a full or partial evaluation or other purpose, what work was conducted, effective date of report, and what work remains to be done. (iii)The Competent Person should state whether the document is PERC compliant. If a reporting standard or code, other than PERC has been used, The Competent Person should include an explanation of the difference.	• Mineral resource inventory for Viscaria Project D zone was completed to update mineral resources after over 10 000 metres of extensional exploration drilling. Previous mineral resource estimation was completed November 2015 and it was used as a block model for Viscaria Project Scoping study. The new updated block model will be used as base of the mine planning for Viscaria project pre-feasibility study. The block model will further be updated Q1 2021 when remaining drillholes are validated and reported to create the final pre-feasibility study block model. • Mineral Resource Inventory was completed. Work phases included: QAQC analysis, database validation, structural geological studies, lithological interpretation, mineralisation interpretation, drillhole coding and preparation with compositing&declustering&topcutting, univariate statistics, bivariate statistics, variography, QKNA, block model creation and coding, ordinary krieged estimation, density estimation, block model validation, mineral resource inventory statement and resource report writing • Mine planning and processing testwork was not completed for this report. Competent person relies on the extensive scoping study work completed 2016. Mine planning and processing work is part of the pre-feasibility study work which is currently on-going • Report uses PERC standard 2017 as a minimum requirement for reporting

Project Outline	• Brief description of key technical factors that have been considered	• All key technical factors related on the resource estimation are shown in the report and discussed in the detail • Mine planning and ore processing factors are discussed in the report based on the 2016 scoping study. • Open pit operation at shallow depths of D zone and underground operation at deeper depths of D zone is designed.
History	• (i) Discuss known or existing historical Mineral Resource estimates and, reconciliations of reported resources/reserves and actual production for past and current operations, including the reliability of these and how they relate to the PERC Standard. (ii) Previous successes or failures should be referred to transparently with reasons why the project should now be considered potentially economic.	• No mining of the D zone has been completed yet and hence there is no reconciliation information available. • 15 years of mining with 12.5Mt @ 2.3% Cu was done in the A zone during 1982-1997. Experience from the past mining improves the technical knowledge of planned mining operation at the D zone. • Twelve JORC compliant mineral resource updates have been completed in Viscaria project. Historical resource estimates are discussed in the report • Successful mining operation was completed 1982-1997. Viscaria Project has systematically worked towards reopening the Viscaria mine since 2009.
Key Plan, Maps and Diagrams	• (i) Include and reference a location or index map and more detailed maps showing all important features described in the text, including all relevant cadastral and other infrastructure features. If adjacent or nearby properties have an important bearing to the report, then their location and common mineralised structures should be included on the maps. Reference all information used from other sources. All maps, plans and sections noted in this checklist, should be legible, and include a legend, coordinates, coordinate system,, scale bar and north arrow. (ii) Diagrams or illustrations should be legible, annotated and explained where necessary	• All location, index and detailed maps are shown and discussed in the report
Project Location and Description	• (i) Description of location (country, province, and closest town/city, coordinate systems and ranges, etc.). (ii) In respect of each property, diagrams, maps and plans should be supplied demonstrating the location of prospecting/mining rights, any historical and current workings, any exploration, and all principal geological features.	• The D Zone Area of the Viscaria Copper Project (the project) is located in Kiruna municipality (population 23,500), in Norrbotten County, the northernmost County in Sweden, approximately 150 km north of the Arctic Circle. • The project lies approximately 5 km northwest of the city of Kiruna.

		• Project is located 270 km north-northwest of the port city of Luleå, which lies on the Gulf of Bothnia in the north of the Baltic Sea and 130 km southeast of the port city of Narvik in northern Norway
Topography and Climate	• (i) Topo-cadastral map in sufficient detail to support the assessment of eventual economics. Known associated climatic risks should be stated.	• The location of the mine site, 150 km north of the polar circle and 250 km west of the North Atlantic sea strongly affects the climate in the area. February has the lowest temperature down to -21º C. The warmest month is July, when the temperature normally varies between 9,2º C to 17,6º C. Precipitation is greatest during the summer months with an average value of 94 mm during the month of July, followed by August with 68 mm. The snow depth average is 75 cm, and snow and ice cover the landscape and lakes from October to May. The melting of the frozen precipitation results in a short and intensive spring flood normally lasting a few weeks in May to June. • The average value of the wind speed at Kiruna Airport measuring station is 3,5 m/s and dominating wind direction is from south to south-west • Mining in subarctic conditions means climatic risk for machinery and labour force, but 100 years of mining tradition in the surrounding underground and open pits has developed modern technology and working conditions that are very well adapted for the environmental conditions. • -Water supply and mine drainage systems must be adapted to arctic dry periods during winter and high flows during late spring and summer, to support process- and drilling water.
Geology	• Description of the nature, detail, and reliability of geological information (rock types, structure, alteration, mineralisation, and relation to known mineralised zones, etc.). Description of geophysical and geochemical data. Reliable geological maps and cross sections should exist to support interpretations.	• Geological features are described in detail in the report
Mineralogy	• Describe the mineralogy of the deposit including the distribution, quantity and other characteristics of the important minerals. Includes minor and gangue minerals where these will have an effect on the processing steps. Should indicate the variability of each important mineral within the deposit.	• The conspicuous features related with the D orebody are: • Elevated content of Fe oxides (26-30% of magnetite) with exclusively content of Cu sulphides (chalcopyrite) replacing magnetite and a marble unit. • Hosted by a marble unit located within the lowermost mineralized package of the Viscaria Formation, overlying a carbonate breccia zone that

		extends with uniform thickness parallel to the deformation zone along the basalt footwall contact. • Chalcopyrite is preferentially precipitated in magnetite zones with stronger mineralization near their contacts. • Negligible contents of Fe and Zn sulphides. Peripheral or marginal zones contain slightly presence of pyrite replacement on magnetite. • Redox boundaries hematite - magnetite are observed at the footwall contact zones of the Cu mineralization. Cu sulphides sit exclusively on the magnetite side and strongly replace their contacts.
Mineral rights and land ownership	• Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, historical sites, wilderness or national park and environmental settings. In particular the security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area. Location plans of mineral rights and titles. It is not expected that the description of mineral title in a technical report should be a legal opinion, but should be a brief and clear description of such title as understood by the author.	• Copperstone has three granted mining concessions under the Minerals Act (SFS1991: 45); Viscaria K no 3 and K no 4 which were granted by Bergsstaten in January 2012 and Viscaria K no 7 which was granted in November 2014. Viscaria K no 7 has been appealed and is currently at governmental level for decision. • The area around the deposit is planned in detail for mining operations and designated as an area of national interest for deposits of valuable substances or materials that are of great importance for the country's supply readiness. • The Viscaria mine is surrounded by national interests for reindeer husbandry. Migration routes of national interest run north, south and west of the mining area. There are areas of national interest south of the mining area in the form of resting pastures and a difficult passage. The Viscaria mine is mainly located within Laeva's Sami village's reindeer husbandry area, but also touches on Gabna Sami village's reindeer husbandry area. • In order to restart the Viscaria mine with associated processing plants and mine waste facilities, a permit is required in accordance with the Environmental Code. Mining activities are considered environmentally hazardous activities according to Swedish law and require a permit. The environmental permit regulates how mining operation may be conducted and under what conditions. For mining operations, it is required that the permit process is conducted by the Land- and Environmental Court.
Legal Aspects and Tenure	• The legal tenure should be verified to the satisfaction of the Competent Person, including a description of: (i) The nature of the issuer’s rights (e.g. prospecting and/or	• As per November 10, 2020 and the date of this report, Copperstone had six approved exploitation concessions and thirteen exploration permits

	mining) and the right to use the surface of the properties to which these rights relate; (ii) The principal terms and conditions of all existing agreements, and details of those still to be obtained, (such as, but not limited to, concessions, partnerships, joint ventures, access rights, leases, historical and cultural sites, wilderness or national park and environmental settings, royalties, consents, permission, permits or authorizations) (iii) The security of the tenure held at the time of reporting or which is reasonably expected to be granted in the future along with any known impediments to obtaining the right to operate in the area; and (iv) A statement of any legal proceedings that may have an influence on the rights to prospect for minerals, or an appropriate negative statement.	• Exploitation concession and exploration permits which all relevant details are reported in mineral resource inventory report
Licences and Permits	• The status of titles and approvals critical to the economic viability of the project, such as mining leases, development permits, discharge permits and governmental approval. Description of the environment and of anticipated liabilities. Location plans for mineral rights and titles.	• The environmental application will include present granted concessions at Viscaria no 3 and no 4. No 7 will be included in the application for an environmental permit if a decisive positive result will come before the process is ended. • Copperstone Resources AB has started the process of obtaining land leases from the state and other landowners.
Personal introduction into projects and verification of the data	• (i) Date of visit(s) (i) Meetings with key persons responsible for the project which is being reported upon, defining their responsible fields and experience relevant to the project. (ii) Visit to project area resulting in a report itemising significant observations (iv) What parts of the project were available for personal verification (v) List of data used or cited in preparation of the Public Report	• Roles and responsibilities of persons involved for the project is described in the report • Competent person lives and works in the Copperstone Kiruna office. All the persons involved in the compilation of technical report works in the Copperstone Kiruna office. Therefore all the data and significant observations are always available for verification.

Table 1 Part 2 - Sampling Techniques and Data

Criteria	PERC Code explanation	Commentary
Type(s) of sampling	• The type of sampling and its location, which will give rise to the results being reported, should be stated. Types of sampling include stream sediment, soil and heavy	• Viscaria Copper Project D Zone mineralisation has been sampled using diamond drill core methods.

	mineral concentrate samples, trenching and pitting, rock chip and channel sampling, drilling, auger etc. Examples of locations include old workings, mine dumps etc. Wherever possible the spacing of such samples should be stated, and locations shown on coordinated maps, plans and sections at suitable scales.	• Core samples were generally taken at 1 metre intervals (except where adjusted to geological boundaries) after geological, geotechnical logging and photography. Cores were aligned prior to splitting it in half and sampled as required. • As a rule, no sampling occurred across obvious geological boundaries (sample lengths of between 0.4 m and 1.4 m were permitted at geological boundaries). • Mineralised zones were determined based on detailed geological logging, sampling, and assay results.
Drilling techniques	• Drilling techniques may include core, reverse circulation, percussion, rotary auger, down-the-hole hammer, etc. These should be stated and details (e.g. core diameter) provided. Measures taken to maximise sample recovery and ensure representative nature of the samples should be stated.	• There are 3709 drillholes is in the Viscaria database. 3576 of the holes are diamond core drillholes and 133 holes are other types, mainly RC holes. Most of the holes locate to A zone historic underground mine. D zone is estimated using holes located in the D zone area. Total of 157 diamond drillholes sized at HQ (63.5 mm diameter) and NQ (47.6 mm diameter) are used for calculation of the resources. Other hole types (RC) have been used to assisting the geological interpretation, but they are not used for grade estimation. • Ground conditions within the D Zone area are generally stable and as a result, no extra measures have been implemented to maximise sample recovery. In few cases triple tubing has been used to increase core recovery. • Each core run has been logged to measure and record core recovery, geology, and geotechnical data using digital logging software.
Drill sample recovery	• Whether sample recoveries have been properly recorded and results assessed should be disclosed. In particular the report should state whether a relationship exists between sample recovery and grade or quality and sample bias (e.g. preferential loss/gain of fine/coarse material).	• Detailed review was completed for core recoveries. Average core recovery for D zone samples inside copper mineralisation is 80%. Lower recoveries locate near the structures or zones of oxidation. Each of the interval with poor core recoveries was reviewed by Competent Person for representativeness. Poor recoveries with clear bias were deleted from the estimation. • No relationship between sample recovery and grade has been established. • Competent Person opinion is that remaining sample population has good representativity and required recoveries and therefore database is acceptable for estimation.
Logging	• Whether samples have been logged to a level of detail to support appropriate Mineral Resource estimation,	• All available core has been geologically logged for lithology, weathering, structure, mineralogy, mineralisation, colour, and other features. In addition, the core has been geotechnically logged for rock properties

	mining studies and metallurgical studies should be confirmed, and whether logging is qualitative or quantitative in nature should be stated. Core (or trench, channel etc.) photography should be included.	and/or characteristics, including Rock Quality Data (RQD), defect logging and measurement for most of the drillholes. • Core photography has been completed on all the recent drilling undertaken by Avalon Minerals and Copperstone Resources (both wet and dry). • Specific gravity (rock density) determinations were conducted by trained Avalon Minerals personnel using the weight in air/water technique. Copperstone Resources has not conducted density measurements. • Logging and sampling were completed by trained, competent geologists in accordance with internal protocols and QA/QC procedures. • Logging is qualitative in nature and has a sufficient level of detail to support the definition of geological domains appropriate to support Mineral Resource estimation and classification.
Other sampling techniques	• Nature and quality of sampling (e.g. cut channels, random chips etc.) and measures taken to ensure sample representativity should be stated. The precise location and unique numbering of each sample should be provided by reference to a coordinate system (which should be stated).	• Other sampling techniques than drillholes have not been used in the Viscaria D zone.
Sub-sampling techniques and sample preparation	• For sampling from core, whether cut or sawn or whether quarter, half or all core has been taken in the course of sampling should be stated. If non-core, whether riffled, tube sampled, rotary split etc. and whether split wet or dry. For all sample types, the nature, quality and appropriateness of the sample preparation technique should be described, together with quality control procedures adopted for all sub-sampling stages to maximise representativity of samples. Measures taken to ensure that the sampling is representative of the in situ material collected should be stated. Whether sample sizes are appropriate to the grain size of the material being sampled should be described. A statement as to the security measures taken to ensure sample integrity is recommended	• Drillholes with sample intervals (Copperstone Resources) and sample bags with cut core (Avalon Minerals) were transported via courier to ALS, Piteå using chain of custody procedure. • Diamond drill core was sawn longitudinally and split in half for sampling. Sample interval boundaries are marked on core boxes at the relevant position along the drill core. • Sample preparation procedures are appropriate, with ALS preparing samples by crushing to < 2 mm, splitting using a riffle splitter, then pulverising to achieve a 250 g sample mass that is sub-sampled for analysis. • A series of certified reference materials (standards), blank samples as well as the submission of duplicate core or crush duplicate samples have been inserted into the sampling programme. The frequency of analysis of blanks and standards has been approximately 1 standard and 1 blank sample in 20 samples. A duplicate sample is submitted for analysis at a frequency of 1 in every 20 samples.

		• Sample sizes have varied according to the length of core sample taken as determined by geological logging. Sample lengths are appropriate for the intersected mineralisation and minimum core diameters are greater than the maximum mineralisation crystal size.
Assay data and laboratory investigation	• he nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total should be stated. Attention should also be given to how presented assay results express the assumed extractable content of the element. Sample preparation and assaying may be carried out by internal or independent laboratories. The laboratories actually used for this work should be identified in any report. In any case, there should be consideration given to the accreditation of the laboratory (e.g. ISO standards awarded such as ISO 9000:2001 and ISO 17025) and to the actual procedures used at all stages of sample preparation and analysis, including the use of randomisation, internal and external standard samples, and blanks, as well as monitoring procedures for systematic bias. In particular, it should be noted whether analyses of samples within the set used to support the resource estimate have been replicated independently in other laboratories. For assaying on large sample sets for mineral resource estimation, it is often appropriate to use 5 – 10 % of the samples for control purposes, depending on the circumstances. Report the methods of verification of assaying.	• Assaying has been done in the ALS laboratories with following assay test methods: ME-ICP61, MEICP81/ME-ICP81x and CU-OG62 to determine Copper grades. ME-ICP61 and CUOG62 uses a 4-acid digest near-total methods) whilst ME-ICP81 and ME-ICP81x uses sodium peroxide fusion (total methods). • Each assay method uses a different methodology and has the following detection limits: ○ ME-ICP61: 0.0001% to 1%. ○ ME-ICP81(x): 0.01% to 50%. ○ CU-OG62: 0.01% to 40%. • Standards and blanks are inserted into the sampling programme and monitoring of QA/QC is done on a batch-by-batch basis. • Check assay program was completed for 2015 which showed slight positive bias towards check assays compared to original assays. 2015 estimation downgraded measured resources to indicated resources due to check assay bias. Further check assaying is not done, and positive bias has not been followed. • No assay data has been adjusted. • Competent Person recommends check assay program from drilling after 2015. 5-10% of samples inside estimation domain should be re-assayed. It is further recommended to follow-up positive bias in the previous check assay program.
Verification of results	• The verification of selected intersections by either independent or alternative personnel is recommended as is the use of twinned holes (a hole as near as possible to a pre-existing hole to make sure that it has the correct position and geological interpretation), deflections or duplicate samples.	• The Competent Person works and is based in the Viscaria project facilities and has reviewed selected drillholes to review drilling, logging, photography, core splitting, sampling, sample preparation and assay procedures and results, including significant intersections. • Significant intersections have been reviewed by several international experts consulting/working for the project. • Copperstone Resources Senior Management regularly review sampling and assay results, including significant intersections.

		• No twinned boreholes have been drilled. One deep drillhole wedge is completed by 2015 and separation of the parent hole and child hole at the mineralisation depth is 30 metres, which is too long for verification purposes • Projects operational and QA/QC standards, procedures and protocols are consistent with, or exceed industry standards. These cover all aspects of data capture, data management, storage, and transfer
Data location	• A statement is required regarding the accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations. Quality and adequacy of topographic control should be described and locality plans provided.	• Borehole collar coordinates have been surveyed using Differential GPS in the Swedish coordinate system RT90 2.5 gon vast (which is situated 4.01 degrees to the east of True North) to a decimetre level of accuracy. • Collar surveys have been completed by a qualified and competent local contract surveying company that has had a long engagement with the project. Survey equipment is well maintained and regularly calibrated and checked for accuracy. • Re-survey and checks of historical borehole collars have been completed where possible and no material issues have been identified. • Regular downhole surveys are conducted using a Reflex Gyro tool that measures borehole dip and azimuth. These measurements are recorded in borehole databases and used to control borehole orientation in geological models. • The topographic surface was derived from LIDAR data (airborne laser scanning) purchased from Lantmäteriet (the Swedish mapping, cadastral and land registration authority). Data resolution is specified as accurate to 20 cm for elevation and 60 cm in the horizontal. The LIDAR topographic surface has been verified by Differential GPS collar surveys. • The level of accuracy of the LIDAR topographic surface is considered adequate for the purposes of resource estimation.
Data density and distribution	• A statement should be included as to whether the data density and distribution are sufficient to establish the degree of geological and grade or quality continuity appropriate for the Mineral Resource and Mineral Reserve estimation procedure and classifications applied, and whether sample compositing has been applied. Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent	• The mineralisation was drilled from surface predominantly on a nominal northwest-southeast 50 m sections for shallower parts and nominal southeast-northwest 50 m sections for deeper parts. However, areas of wider drill spacing do exist. • Data distribution in the resource area is sufficient to support geological interpretation and grade continuity for the purposes of generating a Mineral Resource estimate and resource classification. • Drillhole samples are composited, declustered and topcut for geostatistical analysis and resource modelling.

	to which this is known, considering the deposit type should be stated	• Mineralisation is subvertical dipping to SE in shallower part and to NW in deeper parts. Drill direction is adjusted to get optimal intersection angle to mineralisation. • Drillholes are generally collared at dips of between 45 degrees and 60 degrees. The mineralised zones generally dip at between vertical and 85 degrees and therefore drilling generally intersects mineralisation at between 30 degrees and 45 degrees. • All boreholes used to support the resource estimate have down hole survey data recorded at an average of 6 m intervals, which provides acceptable down hole control on borehole orientation and consequently the location of mineralised zones and samples. • The relationship between the orientation of drilling and mineralised zones is not considered to have introduced a sampling bias or adversely affect the resource estimate.
Reporting Archives	• Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) for preparing the report should be provided.	• Primary data is stored (where possible) in its source electronic form. Assay data is retained in both the original certificate (.pdf) form, where available, and the text files received from the laboratory. • All data is loaded into Viscaria's acQuire database and transferred to geology and resource databases as required via documented standard operating procedures and guided import validations to prevent incorrect or invalid data transfer.
Audits or reviews	• The results of any audits or reviews of sampling techniques and data should be presented and discussed.	• Viscaria project logging, sampling, sample preparation, data, and data management processes have been audited and reviewed by the Competent Person, who concluded that the processes are acceptable and suitable for the purposes of reporting in accordance with PERC, 2017. • All historical data has been validated and migrated into a database and this data has been checked and validated by the Competent Person. Errors and/or material data issues were resolved by either fixing the issue or excluding it.

Table 1 Part 3 - Reporting of Exploration Results

Criteria	PERC Code explanation	Commentary

Reporting exploration results		• No D Zone exploration results have been reported in the accompanying release, therefore there are no drill hole intercepts to report. This section is not relevant to this Mineral Resource estimate.

Table 1 Part 4 - Estimation and Reporting of Mineral Resources and Mineral Reserves

Criteria	PERC Code explanation	Commentary
Database integrity	• Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes. Data verification and/or validation procedures used.	• The Viscaria Project maintains an acQuire database to manage all drillhole data. • Data is logged using acQuire compatible templates which contains validation checks and links to the acQuire libraries. • Raw data is stored in the data server which is included in the daily back-up copies • Validation checks are written into the acQuire database, which are activated to ensure that data is valid and loaded correctly. • Read/write privileges for all the database tables is limited to database manager. • The acQuire database is backed up on a regular basis, with roll-back procedures in place. In addition, change logs are retained to ensure data integrity. • All historic data was imported to acQuire database during May-July 2020. Data and the database were validated by acQuire database manager.
Geological interpretation	• Description of geological model and inferences made from this model. Discussion of sufficiency of data density to assure continuity of mineralisation and provide an adequate database for the estimation procedure used. Discussion of alternative interpretations and their potential impact on the estimation	• Geological setting and interpretation of the mineralisation of D-Zone have been confidently established from drillhole logging, sampling, analysis, and geological mapping. • Geological interpretation was done in the three different stages – 1) structural interpretation done by international expert to define structural controls of the ore continuity, 2) lithological interpretations to create 3D shapes of the main lithologies and 3) mineralisation interpretation. Mineralisation interpretation was completed using guidance from structural and lithological interpretations. • All available data has been used to develop a robust three-dimensional (3D) model of major geological units that host the mineralisation.

		• High grade copper mineralisation consists of 3 separate zones (D1, D2 and D3) striking approximately 45 degrees and dipping at between 80 degrees and 90degrees. • The limits of the mineralisation have not been completely defined and are open at depth and along strike to the north and south. • There is high level of understanding of the local geology and controls on mineralisation; and therefore a high level of confidence in the geological interpretation and 3D models. There is several drillholes drilled to test robustness of the resource model. Drillholes has been intersecting mineralisation within expected variations regarding grade, thickness, and copper metal. • As a result, alternative interpretations are not required.
Estimation and modelling techniques	• The nature and appropriateness of the estimation techniques applied and key assumptions, including treatment of extreme grade values, domaining, compositing (including by length and/or density), interpolation parameters, maximum distance of projection from data points, and the proportion of the estimate that is extrapolated. Interpolation means estimation which is supported by surrounding sample data. Extrapolation means estimation which extends beyond the spatial limits of the sample data. The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data. The assumptions made regarding recovery of by-products and other minerals that will affect processing of the ore. In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed. Any assumptions behind modelling of selective mining units (e.g. non-linear kriging). The process of validation, the checking process used, the comparison of model datato drill hole data, and use of reconciliation data if available. Detailed description of the method used and the assumptions made to estimate tonnages and grades	• Ordinary kriging has been used to interpolate the grades in the block model. Estimation method was chosen based on the geostatistical characteristics of the data, style of the deposit and drilling density. Competent person opinion is that the selected method is the best estimation method for Viscaria D zone. Alternative calculations for copper grade have been done using simple kriging and inverse distance methods to validate ordinary kriging results. • Samples were composited to 1 metre composites. 1m was selected to composite length as it is most common interval (40% of all samples) and 90% of the data is 1m or less. A small amount of data (10%) is longer than selected composite length which causes some samples to be cut in compositing process. However, this is seen to be minor and having minor impact to the estimation. Samples longer than 3 metres were deleted from the estimation due to historical nature and unrepresentative sampling. Number of deleted samples due to sample length is 39. • Compositing was done by length compositing. No density compositing was competed. Density is estimated using OK directly to the blocks which manages density variations inside the domains. • Cell declustering with appropriate declustering cell was completed. Size of cell was defined by declustering analysis 50mx50mx25m and in broad scale it matches with drilling grid. Declustering was used to remove impact of clusters in the statistical analysis and to create appropriate comparison point for the model grades.

	(section, polygon, inverse distance, geostatistical, or other method). Description of how the geological interpretation was used to control the resource estimates. Discussion of basis for using or not using grade cutting or capping. If a computer method was chosen, description of programmes and parameters used. Geostatistical methods are extremely varied and should be described in detail. The method chosen should be justified. The geostatistical parameters, including the variogram, and their compatibility with the geological interpretation should be discussed. Experience gained in applying geostatistics to similar deposits should be taken into account. The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource. All metals (or other components) to be treated should be shown, even those rejected as waste. A statement that there are no other deleterious elements requiring removal should be included.	• Global topcut analysis was performed for Cu, Fe and S as a part of the geostatistical analysis. Shape and continuity of the histogram, CV of the data population, continuity of data in the log-probability plot and cumulative metal in the mean-variance plots was included to global topcut analysis to evaluate extreme grade values. All the elements and domains showed well defined normal grade distributions with relatively low uncut CV's and very low sensitivity of metal to topcut grade which indicates minimal need for the topcuts. 5% Cu topcut was used for domains 101 and 111 (D1 mineralisation subdomains). Topcut decreased metal by 1%. Competent Person opinion is that topcut is conservative. Conservative approach was chosen to minimize the risk related to few individual high-grade samples inside the main mineralisation D1. • Three parallel subvertical mineralisations were domained – 101 (D1), 102 (D2) and 103 (D3). D1 is main mineralisation continuing throughout entire D zone with about 1300 metres modelled strike length and 800 metres length in depth. Thickness of D1 varies between few metres and 20 metres. D1 locates mainly in the contact of the magnetite skarn and hangingwall metasediments in the east. D2 is smaller copper mineralisation which locates in the deeper part of D zone north. Geologically zone locates in the hangingwall side of the D1 in the contact between magnetite skarn and metasediments. D3 is zone of mineralisation which locates to footwall of the D1 in the contact of the magnetite skarn and footwall breccia/basalt. Main mineralisation D1 was further subdivided to 4 subdomains based on the structural and geological characteristics. Subdomain 101 contains D1 below 100-150metres depth with subvertical SE dip. Subdomain 111 contains D1 in the shallow depths with subvertical NW dip. Domain 161 contains D1 mineralisation which is completely weathered and oxidized. Domain 171 contains D1 which is partially oxidized. Subdomains 101/111 were divided using structural differences and subdomains 161/171 using different weathering characteristics. • Geostatistical analysis was done using Snowden Supervisor v8.13. Geostatistical analysis included univariate statistics, bivariate statistics, declustering analysis, global topcut analysis, trend analysis and boundary analysis.

		• Directional variograms were created for main domains for Cu, Fe and S. All the domains showed strong grade continuity in subvertical strike plane in NE-SW direction and plunging 65 degrees to SW. Sample data was converted to normal score distribution for continuity analysis. Modelled major direction had ranges from 120-140 metres with short- and long-range continuity defined with several points. Semi-major direction was typically poorly defined with 50-100 metres ranges. This was usually less defined with few points visible. Minor direction is across the mineralisation direction and typically follow true downhole characteristics. Directional variograms are modelled using nugget and two points for continuity. Nugget shows about 18-25% variability and it is defined by several points. Nugget is within expectation for this style of the mineralisation. All the directional variograms are back-transformed from the normal score space back to untransformed raw space for geostatistical estimations. • Quantitative Kriging neighbourhood analysis (QKNA) was performed to investigate optimal parameters for robust and good quality ordinary kriged estimation. Results of the analysis were used as background information only and parameters were adjusted to take account of practical factors as well. This causes that selected parameters do not represent only best quality estimation but take into account some local estimation aspects as well. Competent persons opinion is that selected set of parameters are best for creating good quality and high confidence estimation for mine planning purposes and some upside may be realised when data density allows more local estimation to be conducted. • Block modelling is done using Geovia Surpac 2020 (x64). Drillhole database is taken directly from the acQuire to Surpac access database. Information is handled in the access with saved macros and queries to ensure no human errors/mistakes are done and that all the steps are systematic, repeatable, and auditable. All the estimation steps are done in Surpac. Each of the steps are done using Surpac macros to ensure that steps are done in systematic and auditable way. • Resource modelling was done using RT90 2.5 gon to West grid. Viscaria deposit is striking NE-SW in the RT90 grid. • 45 degrees rotated block model was created to adjust in the difference between RT90 grid and strike of the mineralisation. Block size was defined

		based on the QKNA and practical aspects. QKNA showed a requirement for relatively large blocks to be estimated to minimize the conditional bias for the estimation. 40m x 20m x 20m is used as a parent block size and 1.25m x 0.625m x 0.625m subcelling is performed. Block size in strike direction is about 75% of the sample spacing and about 40% in the depth direction. Competent Person opinion is that data density is acceptable to estimate grade to the blocks. • Anisotropic search neighbourhood was defined based on variogram ellipsoid. Orientation of search ellipsoid uses variogram ellipsoid direction. Search distances and number of samples in the estimation was defined using compromise between QKNA and practical matters. Two search rounds were deployed. First search round used 100m x 50m x 25m search distances with minimum of 6 and maximum of 20 samples used in the estimation. Second round of search was performed for the blocks which were not informed in the first round. Second round used 300m x 200m x 100m metres search distances with minimum of 4 and maximum of 16 samples. More than 95% of the indicated resources were informed in the more local first search round. Second round informed mainly for the inferred resources. Competent Person opinion is that local estimation with interpolated grades in the indicated resources gives high confidence for the estimated resources. • Sample grid in the indicated resources is high in most of the D zone. Estimation is done in the local estimation search and nominal distance from sample point to interpolated block centroid is 20-25 metres. Part of the deeper D zone north indicated has wider data density and the largest nominal distance from sample point to interpolated block centroid is 80-100 metres. No grade extrapolation is allowed for indicated resources. Inferred resources are partially estimated in the local first search round and mostly in the global second search round. Slightly over 50% of the inferred resources is based on the interpolation and less than 50% is based on the grade extrapolation beyond last sample point. Maximum extrapolation is about 100m which is less than range of the variogram. Competent persons opinion is that 1) most of the indicated resources is defined by high confidence sample grid, 2) part of the D zone deep north is defined with wider sample grid and confidence is lower and 3) extrapolation in the inferred resources is conservative.

		• No reconciliation data is available. • Boundary analysis was performed for all the domains. Hard-hard boundary approach was used between 101, 102 and 103 domains. Different approaches were selected inside 101 subdomains. Soft-soft boundary was used in the fresh D1 subdomains 101 and 111. Also oxidized subdomains 161 and 171 used soft-soft boundary in the estimation. Boundary between fresh D1 and oxidized D1 subdomains was used as hard-hard. • Competent Person has extensive experience working in the similar style deposits both in the resource development and in the mine. Experience contains more than 100 grade control resource models in the operating mine with mine to mill reconciliation information available for quality control and several Mineral Resource Inventory models. Competent persons opinion is that selected parameters and selected methodology is suitable for Viscaria D zone and model will have high confidence. • Viscaria D zone is NE-SW striking subvertical deposit with 1300 metres of strike extend and 800 metres of vertical extent. Ore hosting package magnetite skarn has true thickness between 10-50 metres and it contains 3 subvertical, parallel and stratiform copper mineralisation. Thickness of copper mineralisations varies between few metres and 20 metres. Host rock magnetite skarn between copper zones and around copper zones is mineralised waste which contains copper and iron. Copper grades inside copper mineralisation varies between NE-SW in the strike orientation and several high-grade zones can be identified in the longitudinal section. Main grade continuity is 65 degrees plunge to the southwest. Also shallow about 20-25 degree plunge direction is recognized. Main steeper grade continuity direction is believed to have strong structural control and it relates to feeder structures. Shallower plunge direction is controlled by pinch and swell structures when softer carbonate rock has deformed inside more competent rock packages. Highest grade and metal contained areas are located to the deeper part of the D zone north and it can be speculated that those areas are closer to feeder structures. D zone is currently open at depth in D zone north, D zone central and D zone south. D zone north is open also at north and D zone south is open at south. Competent Person opinion is that grade continuity and structural controls of the Viscaria are very well understood for the stage of the project and it allows high quality model.

Metal equivalents or other combined representation of multiple components	• The following minimum information should accompany any report which includes reference to metal equivalents (or other component equivalents) in order to conform with these principles. It is necessary to identify: 1. individual assays for all metals included in the metal equivalent calculation; 2. assumed commodity prices for all metals. (Companies should disclose the actual assumed prices. It is not sufficient to refer to a spot price without disclosing the price used in calculating the metal equivalent); 3. assumed metallurgical recoveries for all metals and the basis on which the assumed recoveries are derived (metallurgical test work, detailed mineralogy, similar deposits, etc.); 4. a clear statement that it is the company's opinion that all the elements included in the metal equivalents calculation have a reasonable potential to be recovered; and, 5. the calculation formula. In most circumstances the metal chosen for reporting on an equivalent basis should be the one that contributes most to the metal equivalent calculation. If this is not the case, a clear explanation of the logic of choosing another metal must be included in the report. Estimates of metallurgical recoveries for each metal are particularly important. For many projects at the Exploration Results stage, metallurgical recovery information may not be available or able to be estimated with reasonable confidence. Overall metal recoveries are usually calculated from a mass balance based on the flowsheet. This should have been demonstrated by the testwork and shown to be relevant to the ore body under consideration and not just the sample treated.	• Copperstone resources has decided not to use metal equivalent calculation. No metal equivalent calculations have been done in the database, interpretation and block model. • Viscaria D zone contains by-product growth opportunity with iron mineralisation inside the copper mineralisation. Mineral resource estimation has been completed based on the copper and iron is treated as possible by-product.
Cut-off grades or parameters	• The basis of the cut-off grades or quality parameters applied, including the basis, if appropriate, of equivalent	• Viscaria D zone is modelled using geological constraints and copper grades. 0.7% Cu cut-off with guiding geological interpretation was used to create flexible geologically sound interpretation. About 25% of the sample data for D1 is less than 0.7% Cu which is caused by internal dilution

	metal formulae. The cut-off parameter may be economic value per block rather than grade.	accepted inside the mineralisation and including lower grade areas to interpretation. 0.7% Cu cut-off is a natural break in the grade populations. • Magnetite skarn was modelled using geological constrains without cut-offs. This zone contains weak copper mineralisation with magnetite dissemination. The zone is estimated as mineralised waste located between and around copper mineralisation. • Mineral resource inventory is reported using global 0% Cu cut-off and 1% Cu cut-off inside copper mineralisation.
Tonnage Factor/Insitu Bulk Density	• Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, the frequency of the measurements, the nature, size and representativeness of the samples.	• Viscaria drillhole database contains 7382 bulk density measurements. 835 density measurements have been done inside copper mineralisation. • Bulk density is measured using Archimedes method weighing mass in air and mass in water which allows direct calculation of density. Density measurements are done in the drill core and mean sample size in the measurements is 60cm. Density measurements are done throughout the whole intersections to ensure sample representativity • The amount of density measurements is sufficient for advanced calculations to maximize the accuracy of tonnes in the estimation. The density of the Viscaria D zone mineralisation was defined using OK to estimate density directly for each of the blocks. This allows each of the block to have individual density which reflects characteristics and variability of the rock. Copper zones and magnetite-skarn has high variability of the density depending on the magnetite amount. Therefore, estimated density is a better method than single density. • Density is one of the key factors impacting the published mineral resource inventory. Two alternative density calculations were conducted to define accuracy and confidence of the density estimation. First alternative method was to define correlations of the density and assayed grades in the sample data. Copper and sulphur showed poor correlation to density indicating that sulphides are not controlling the density of the rock. Iron showed strong positive correlation with density. Polynomial regression of the iron and density was fitted with 0.86 correlation coefficient. Polynomial regression was used to calculate block densities based on estimated iron grades in the blocks. Second alternative method to estimate density was with the classic method of defining a mean density of each domain from declustered sample population and setting block densities to the defined mean value. Mineral resource inventory tonnes

		were compared to two alternative method tonnes. Both check methods were inside expected variations. • Competent person opinion is that density sample population is good for defining accurate density and the result is also confirmed by two alternative methods. This gives high confidence to the tonnes in the mineral resource estimation. • Competent Person opinion is that accuracy of the density model can be further increased by additional density measurements in the deep part of the D zone north and also by testing co-kriging estimation between Fe and density if required cross variograms can be modelled.
Mining factors or assumptions	• The mining method proposed and its suitability for the style of mineralisation, including minimum mining dimensions and internal (or, if applicable, external) mining dilution by waste rock. It may not always be possible to make detailed assumptions regarding mining factors when estimating Mineral Resources. In order to demonstrate realistic prospects for eventual economic extraction, basic assumptions are necessary. Examples include access issues (shafts, declines etc.), geotechnical parameters (pit slopes, stope dimensions etc.), infrastructure requirements and estimated mining costs. All assumptions should be clearly stated.	• Viscaria is at resource development phase and reported Mineral Resource Inventory is used in basis of detailed mine planning for pre-feasibility study • Detailed scoping study is completed 2015-2016 with detailed mine planning and processing. Scoping study shows that RPEEE (realistic prospect for eventual economic extraction) is met at Viscaria • D zone is planned to be mined using open pit and underground mining • The Viscaria underground mine is scheduled to produce at a maximum of 800ktpa in the Base Case Scenario using two different mining methods: 1. Uphole retreat benching with island pillars 2. Downhole benching with waste fill. ○ Uphole retreat benching is utilised in the upper levels of the mine where the grade is lower and is principally aimed at providing economic material for mill feed during the progression to the deeper level, higher grade areas. Downhole benching with waste fill is utilised in the lower levels of the mine where the grade is higher. Development will be undertaken in both mining methods by conventional and well understood drill and blast excavation techniques that are common in underground metalliferous mines. The development will consist of: 1. Sustaining Capital Development: Decline, Decline Stockpiles, Return Air Drives, Level Access, Escapeway Cuddies and Sumps 2. Operating Development: Accesses, Level Stockpiles and Ore Drives • 0.5 meter dilution was assumed in the hangingwall side of the stopes and 1.0 meter dilution was assumed in the footwall side of the stopes. 25 metres is designed spacing of the sublevels • The Viscaria open pit operations will involve conventional open pits employing selective mining techniques to exploit the ore. Backhoe

		excavators and rigid frame off-highway rear dump trucks will be used to mine and haul ore and waste. The mining equipment considered suitable for the project would include 120 to 180 tonne backhoe configured hydraulic excavators and off-highway diesel haul trucks with a payload capacity of around 90 tonnes. Ore will be delivered to the ROM ore stockpile for blending and rehandling by a front-end loader ("FEL") into the crusher Low-grade material will be selectively stockpiled for possible processing later in the mine life. Waste material will be required during preproduction for TSF embankment construction, the establishment of haul roads from the pits to the ROM pad and waste landform areas, ROM pad construction work and sound bunding. The waste landform will be progressed by tipping from a higher level against a windrow and progressively pushing the waste out with a dozer. Rock-lined drains shall be constructed, where required, to ensure excess run-off is controlled and directed down to sediment traps. 20 metres bench height was used in whittle optimization with 53 degree overall slope angle. 3% dilution with 0% copper was included and mining recovery for ore was estimated to 97%.
Metallurgical factors or assumptions	• The metallurgical process proposed and the appropriateness of that process to the style of mineralisation. It may not always be possible to make detailed assumptions regarding metallurgical treatment processes when reporting Mineral Resources. In order to demonstrate realistic prospects for eventual economic extraction, basic assumptions are necessary. Examples include the extent of metallurgical test work, recovery factors, allowances for by-product credits or deleterious elements, infrastructure requirements and estimated processing costs. All assumptions should be clearly stated. A full definition of the minerals or at least the assays is required to ensure that the process is suitable and that any contaminants / pollutants / possible byproducts are recognised and suitable process steps included in the flowsheet.	• Viscaria is at resource development phase and reported Mineral Resource Inventory is used in basis of detailed mine planning for pre-feasibility study • Detailed scoping study is completed 2015-2016 with detailed mine planning and processing. Scoping study shows that RPEEE (realistic prospect for eventual economic extraction) is met at Viscaria • Scoping study level metallurgical tests have been completed including test work programmes were analyses of head samples, comminution characterisation and responses to flotation unit processes. The samples were selected from 16 diamond drill holes in the three zones, totalling about 310 metres interval length. • D Zone fresh ore is highly amenable; 25% Cu grade at ≈ 94% copper recovery. • D Zone transition ore is moderately amenable; nominal 25% Cu grade at mid-60s% copper recovery. • D Zone oxide ore is not amenable to flotation (and is not included in any mining inventory) • No allowance was done for by-products

Others	• Any potential impediments to mining such as land access, environmental or legal permitting. Location plans of mineral rights and titles.	• No potential impediments
Classification	• The basis for the classification of the Mineral Resources into varying confidence categories. Whether appropriate account has been taken of all relevant factors i.e. relative confidence in tonnage/grade computations, confidence in continuity of geology and metal values, quality, quantity and distribution of the data. Whether the result appropriately reflects the Competent Person' s view of the deposit.	• Resource classification to measured, indicated, and inferred categories was done using drillhole spacing, grade continuity, geological and structural knowledge, variography, estimation quality and search neighbourhood parameters. • Measured resources were not defined in D zone • Indicated resources were defined in the areas where drilling density is at least 50m x 50m, grade estimation is interpolated and estimations are mainly done in local 1st round of search. D zone deep north includes minor areas with wider spacing of drilling up to 80m x 80m which was included to indicated category with high geological and structural continuity. Area is also estimated in the local first round of the search and it is estimated using minimum 75% of the samples allowed by search neighbourhood. • Inferred resources are defined in the area where drilling is less than 50m x 50m. Resources include interpolations and extrapolations. A maximum of 100 metres extrapolation is included to the inferred resources. Extrapolation distance is less than the range of the variograms. • Competent Person opinion is that mineral resource inventory categories reflect data spacing and deposit style characteristics and is sufficient for used classification. Lower part of the indicated resources is less confident and requires further drilling for the feasibility study. Inferred resources are conservatively defined with potential for upside.
Audits or reviews	• The results of any audits or reviews of Mineral Resource estimates.	• Detailed Mineral Resource Inventory audit was completed by Chris Grove from Measured Group • No major fatal isssues were discovered in the detailed audit. Auditor has approved and signed off the mineral resources
Discussion of relative accuracy/confidence	• If possible, there should be a statement of the relative accuracy and/or confidence in the mineral resource estimate. For example, the relative accuracy of the resource could be described within stated confidence limits, or, if this is not possible, the factors which could affect the relative accuracy and confidence of the estimate could be discussed.	• Relative accuracy or confidence limits for the mineral resource inventory is not defined. • Grade continuity in the variography is typical for the deposit style, parent block size is relatively large and search environment is relatively large. Estimation quality parameters KE (kriging efficiency) and zz (slope of the regression) show low estimation quality, which could be caused by multiple different factors.

		• We completed two alternative estimations to increase the confidence of the estimation and prove the accuracy of the model. Inverse distance calculation was completed for copper. Second alternative method is simple kriging (SK). Simple kriging is a method which is normally used in deposits where ordinary kriging estimation quality parameters are poor. Estimation uses a combination of estimation quality parameters to direct the grade of the blocks towards mean grade of the domain when good estimation qualities are not reached. Both alternative methods estimated similar mean grades within expected accuracy compared to ordinary kriging estimation. Grade tonnage curves of ordinary kriging, inverse distance and simple kriging showed the expected trend. Inverse distance showed the highest selectivity and the most local estimation. Simple Kriging showed the lowest selectivity and the most smeared estimation. The ordinary kriging grade tonnage curve sits inside two alternative methods showing good compromise between methods. • Competent Person opinion is that alternative estimation methods increase the confidence of Mineral Resource Inventory using ordinary kriging. If ordinary kriging estimation is too selective then reconciliation is expected to be higher tonnes with lower grade. If the model is less selective then the expectation is to have fewer tonnes with higher grade.
Schematic description of the principles for reporting of Mineral Resource and Mineral Reserve	•	• Reported in the body of the report