

# Boliden Summary Report

Mineral Resources | 2023

## Rockliden



---

Prepared by  
Gunnar Agmalm

---

# Table of contents

<b>1</b>	<b>Summary</b>	<b>3</b>
<b>1.1</b>	<b>Competence</b>	<b>4</b>
<b>2</b>	<b>General introduction</b>	<b>4</b>
<b>2.1</b>	<b>Pan-European Standard for Reporting of Exploration Results, Mineral Resources and Mineral Reserves – The PERC Reporting Standard</b>	<b>5</b>
<b>2.2</b>	<b>Definitions</b>	<b>5</b>
<b>2.2.1</b>	<b>Mineral Resource</b>	<b>5</b>
<b>2.2.2</b>	<b>Modifying Factors</b>	<b>6</b>
<b>3</b>	<b>Rockliden</b>	<b>6</b>
<b>3.1</b>	<b>Location</b>	<b>6</b>
<b>3.2</b>	<b>History</b>	<b>6</b>
<b>3.3</b>	<b>Ownership</b>	<b>7</b>
<b>3.4</b>	<b>Environmental, Social and Governance (ESG)</b>	<b>7</b>
<b>3.4.1</b>	<b>Permits</b>	<b>7</b>
<b>3.4.2</b>	<b>Environmental, Social and Governance considerations</b>	<b>8</b>
<b>3.5</b>	<b>Geology</b>	<b>11</b>
<b>3.5.1</b>	<b>Regional geology</b>	<b>11</b>
<b>3.5.2</b>	<b>Local Geology</b>	<b>11</b>
<b>3.5.3</b>	<b>Property geology</b>	<b>12</b>
<b>3.5.4</b>	<b>Mineralization</b>	<b>12</b>
<b>3.6</b>	<b>Exploration procedures and data</b>	<b>13</b>
<b>3.6.1</b>	<b>Drilling techniques</b>	<b>13</b>
<b>3.6.2</b>	<b>Downhole surveying</b>	<b>14</b>
<b>3.6.3</b>	<b>Sampling</b>	<b>14</b>
<b>3.6.4</b>	<b>Density</b>	<b>14</b>
<b>3.6.5</b>	<b>QAQC</b>	<b>16</b>
<b>3.7</b>	<b>Exploration activities</b>	<b>17</b>
<b>3.8</b>	<b>Mining methods, processing and infrastructure</b>	<b>17</b>
<b>3.8.1</b>	<b>Mining methods</b>	<b>17</b>
<b>3.8.2</b>	<b>Mineral processing</b>	<b>17</b>
<b>3.9</b>	<b>Prices, terms and costs</b>	<b>17</b>
<b>3.10</b>	<b>Mineral resources</b>	<b>18</b>
<b>3.11</b>	<b>Mineral reserves</b>	<b>20</b>
<b>3.12</b>	<b>Comparison with previous year</b>	<b>20</b>
<b>3.13</b>	<b>Reconciliation</b>	<b>20</b>
<b>4</b>	<b>References</b>	<b>21</b>
<b>4.1</b>	<b>Public references</b>	<b>21</b>
<b>4.2</b>	<b>Boliden Internal references</b>	<b>21</b>

## 1 SUMMARY

The Rockliden mineralization is situated in Västernorrland, in Örnsköldsvik municipality, about 200 km SW of Boliden. The mineralization is interpreted as a typical Volcanic Massive Sulphide (VMS) deposit and shows a complex geometry of faulting and folding. The deposit has probably formed as one single lens, which has been subjected to deformation after deposition, which resulted in at least seven massive sulphide lenses over a ca 400 m strike extension.

The reported figures summarized in the Table 1 below were originally reported in 2013 and remain unchanged from the previous year's disclosure. Boliden changed reporting standards in 2018 from Fennoscandian Review Board (FRB) to the Pan-European Reserves and Resources Reporting Committee "PERC Reporting Standard 2017" (PERC) and a new PERC version 2021. The reports and estimations summarized here are compiled according to the previous standard (FRB) but intends to comply with PERC. Boliden consider this data accurate and reliable.

Table 1. Rockliden Mineral Resources with additional 15% waste dilution.

Classi- fication	kton	2023				
		Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	Pb (%)
<b>Mineral Resources</b>						
Measured						
Indicated	800	0.08	102	2.1	4.4	0.9
Inferred	9 190	0.05	47	1.7	3.9	0.4

Notes on Mineral Resource statement.

- *There are currently not and have not previously been reported any Mineral Reserves for Rockliden.*
- *Mineral Resource describe the situation as of December 31, 2023 but the actual resource estimation was made in 2013.*
- *Rockliden Mineral Resources are reported with additional 15% waste dilution to be comparative with possible future Mineral Reserve figures.*
- *A cut-off of 500SEK/ton was used as a guide to identify the area for the Mineral Resource.*
- *The high content of deleterious elements (Hg, Sb and As) in the concentrates is one of the challenges to be further investigated if advancing this project.*
- *Tonnes and grades are rounded which may result in apparent summation differences between tonnes, grade and contained metal content.*

---

## 1.1 Competence

The Mineral Resource estimation for Rockliden is made by Boliden in 2013-14. The data from these estimations are compiled into this report by senior resource geologist Lina Åberg and this report updated for 2023 by Mac Fjellerad Persson, Senior Exploration Geologist and Gunnar Agmalm, Manager of Boliden Ore Reserve and Project Evaluation dept. Multiple participants have been involved and contributed to this summary report. Roles and responsibilities are listed in Table 2

Table 2. Contributors and responsible competent persons for this report.

Description	Contributors	Responsible CP
Compilation of this report	Gunnar Agmalm (Lina Åberg)	Gunnar Agmalm
Geology	Jonas Lasskogen, Mac Fjellerad Persson	
Resource estimations	Lina Åberg	
Mineral Processing	Stig Markström	
Mining	Per-Olov Andersson	

Gunnar Agmalm works for Boliden as Manager at Ore Reserves and Project Evaluation and is a member FAMMP<sup>1</sup> and AUSIMM<sup>2</sup>. Gunnar Agmalm has over 30 years of experience in the Exploration and Mining industry. Lina Åberg, Stig Markström and Per-Olov Andersson where all involved in the resource estimation and the studies that this report is based on. Jonas Lasskogen and Mac Fjellerad Persson are responsible for Exploration activities in the area.

## 2 GENERAL INTRODUCTION

This report is issued annually to inform the public (shareholders and potential investors) of the mineral assets in Rockliden held by Boliden. The report is a summary of internal / Competent Persons' Reports for Rockliden. Boliden method of reporting Mineral Resources and Mineral Reserves intends to comply with the Pan-European Reserves and Resources Reporting Committee (PERC) "PERC Reporting Standard 2021". The Mineral Resource Estimation for Rockliden was made 2013 following the Fennoscandian Review Board (FRB) standard. We think the estimation is accurate and reliable to be reported at the original classification.

The PERC Reporting Standard is an international reporting standard that has been adopted by the mining associations in Sweden (SveMin), Finland (FinnMin) and Norway (Norsk Bergindustri), to be used for exploration and mining companies within the Nordic countries.

---

<sup>1</sup> Fennoscandian Association for Metals and Minerals Professionals

<sup>2</sup> Australasian Institute of Mining and Metallurgy

## 2.1 Pan-European Standard for Reporting of Exploration Results, Mineral Resources and Mineral Reserves – The PERC Reporting Standard

PERC is the organisation responsible for setting standards for public reporting of Exploration Results, Mineral Resources and Mineral Reserves by companies listed on markets in Europe. 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.

The PERC standard sets out minimum standards, recommendations and guidelines for Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves in Europe.

## 2.2 Definitions

Public Reports on Exploration Results, Mineral Resources and/or Mineral Reserves must only use terms set out in the PERC standard.

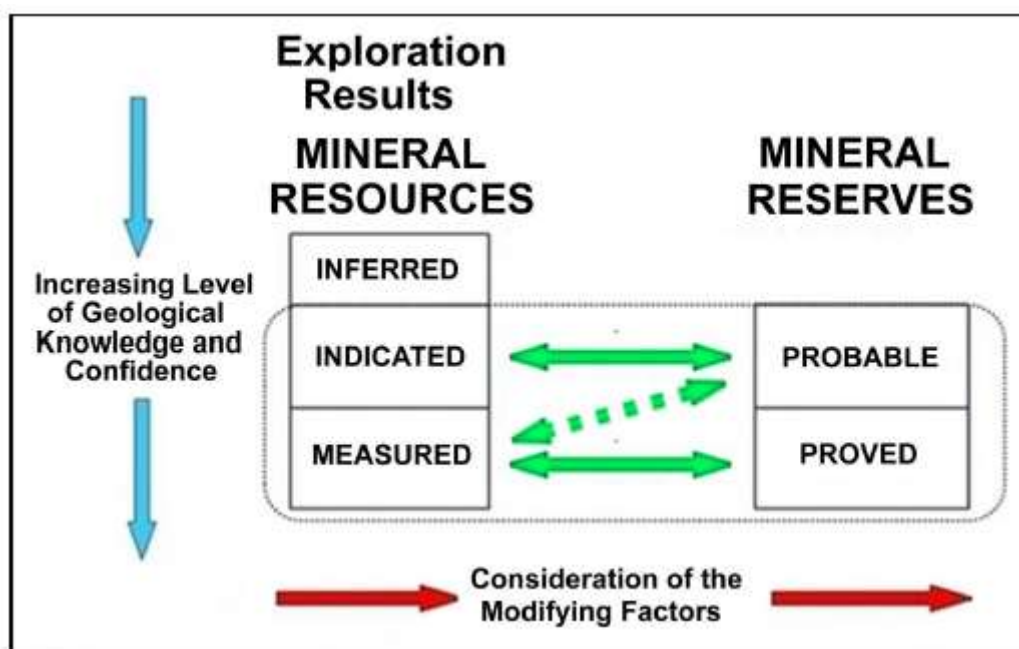


Figure 1. General relationship between Exploration Results, Mineral Resources and Mineral Reserves (PERC 2021).

### 2.2.1 Mineral Resource

A Mineral Resource is a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction.

The location, quantity, grade or quality, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling.

### 2.2.2 Modifying Factors

Modifying factors include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social, governance ('ESG') and regulatory factors.

## 3 ROCKLIDEN

The Rockliden mineralization is interpreted as a typical Volcanic Massive Sulphide (VMS) deposit. It was discovered in 1982 by Boliden staff after a period of geological field mapping in combination with geophysical surveys and diamond drilling. The main economic minerals of interest are sphalerite (ZnS), chalcopyrite (CuFeS<sub>2</sub>) and galena (PbS). The deposit has probably formed as one single lens, which has been subjected to deformation after deposition.

### 3.1 Location

The Rockliden mineralization is situated in Västernorrland, in Örnköldsviks municipality, about 200 km SW of Boliden (Figure 2). In general, road conditions are of high standard and quality. The nearest railway station is in Mellansel about 50 km SE of Solberg. The today nearest processing plant to Rockliden is that in Boliden.

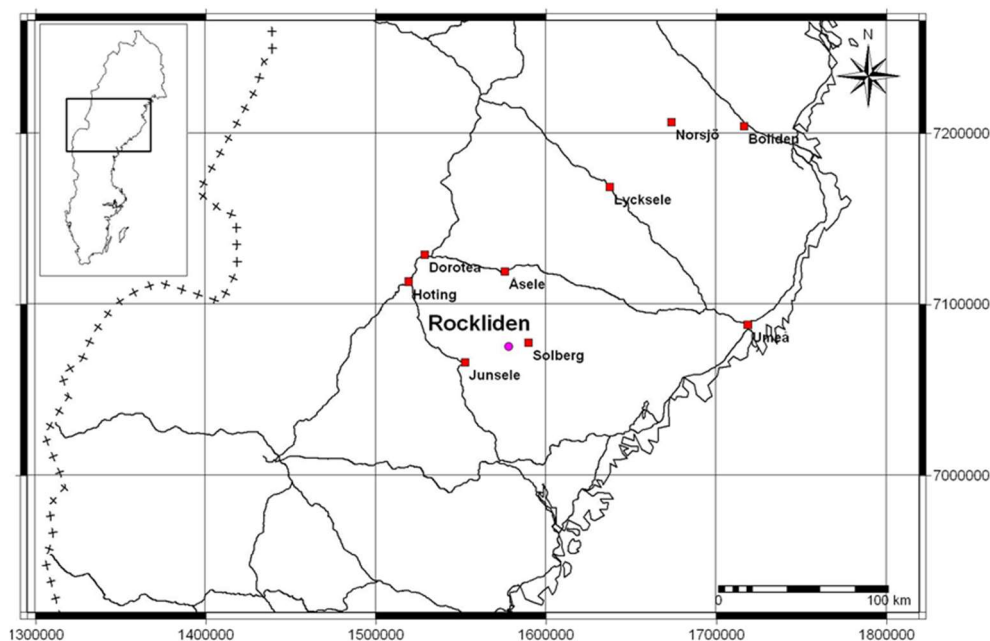


Figure 2. Overview of the north central part of Sweden and its main roads. Location of the Rockliden deposit is indicated as a pink dot (RT90 7072250N/1578230E).

### 3.2 History

Boliden started exploration in the Rockliden area around 1930. Boulder hunting resulted in the discovery of a copper mineralization at Solberg, however grades were not of any economic interest.

During the 1940's exploration focused on nickel, related to a major gabbroic intrusion (the Kläppsjö gabbro), which is situated 10km southwest of Rockliden. No mineralization of economic interest was encountered.

---

The annual mineral hunt of 1975 came up with an interesting copper-nickel mineralized boulder 20km SE of Solberg. Boliden performed both airborne- and ground geophysical surveys. Traces of copper-nickel mineralization were discovered (25km east of Rockliden) but noting of economic interest.

In 1981 exploration started again with boulder tracing, mapping followed by geophysical surveys. The first hole was drilled in 1982. Massive sulphides of significant width were first identified in trenches followed by the first drillhole (ROE14) intersecting mineralization in 1983.

In 1984 the first resource estimation resulted in 1 Mt massive sulphide mineralization. The overburden/glacial till was removed in 1985, uncovering the Rockliden mineralization at surface. Metallurgical tests were made in 1985 and showed significant metallurgical problems. The copper concentrate was not sellable due to high antimony content.

Exploration started again in 2007 and continued up to 2015. In 2010 a resource estimation and a conceptual study was conducted. After exploration drilling in 2012 -2013, with the main focus to increase the mineral resource, a new ore interpretation and estimation was made, followed by study.

The Scoping study was completed in 2014.

The high content of deleterious elements (Hg, Sb and As) in the concentrates is one of the challenges to be further investigated if advancing this project.

### **3.3 Ownership**

The land where the Rockliden mineralization is located is owned by Holmen skog.

### **3.4 Environmental, Social and Governance (ESG)**

#### **3.4.1 Permits**

Boliden holds an exploitation concession, Rockliden K nr 1, which covers the deposit (Figure 3). The concession was granted 2002-04-25 with a validity period of 25 years. The concession area is relatively small, covering an area of 36.01 hectares.

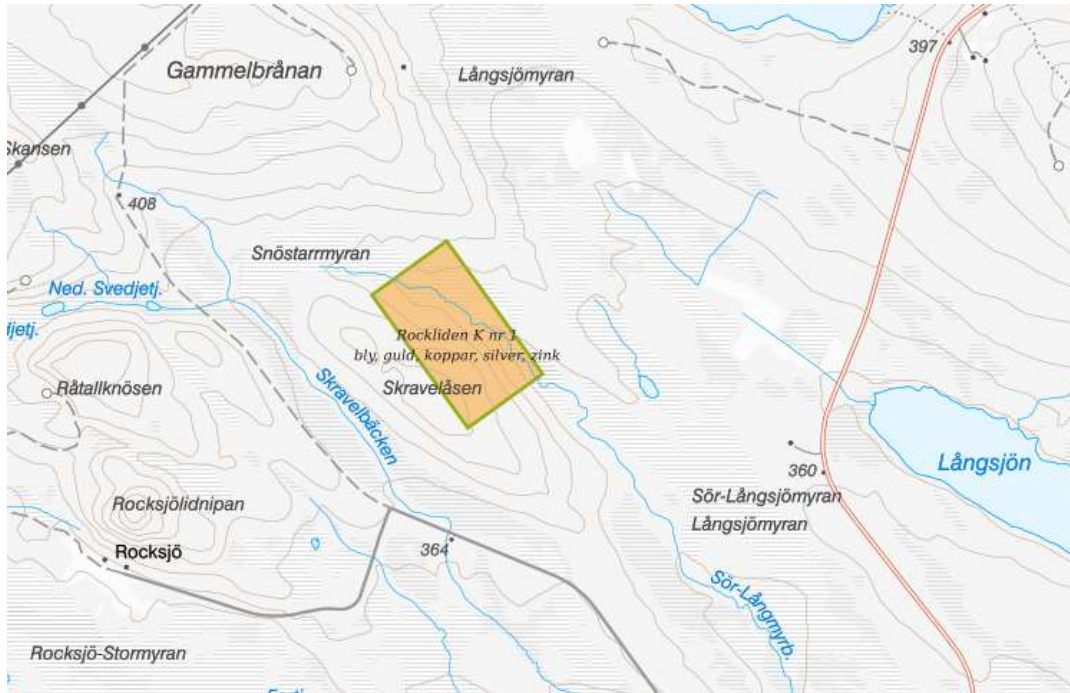


Figure 3. Exploitation concession Rockliden K nr1.

### 3.4.2 Environmental, Social and Governance considerations

#### 3.4.2.1 ESG Commitments

Our business model set our ESG priorities, and take into consideration the risks and opportunities identified by business intelligence and risk mapping, as well as applicable requirements and expectations such as:

- Stakeholder expectations

- Current and potential legislative trends

- ISO 9001, 45001, 14001 and 50001 standards and Forest Stewardship Council (FSC® COC-000122)

- OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-affected and High-risk Areas

- GRI Standards (Global Reporting Initiative)

- UN Sustainable Development Goals (SDGs)

- UN Global Compact

- ICMM Mining principles

We regularly consult prioritized stakeholder groups on our sustainability performance from a broader perspective. These stakeholders are asked to comment on Boliden’s performance to drive further improvement.

Boliden is a member of ICMM and the national mining associations in the countries where Boliden Mines operates. These commitments imply implementing relevant international and national Environmental Management System (EMS) standards and guidelines, such as, e.g., the Global Industry Standard on Tailings Management on an international level and Mining



---

RIDAS on a national level. In addition to this, Boliden Mines is certified according to a series of standards, such as:

ISO 14001:2015 - Environmental management systems.

ISO 45001:2018 - Occupational health and safety management systems.

ISO 50001:2018 - Energy management systems.

Boliden has implemented an integrated management system (Boliden Management System, BMS) which sets a common base for all activities developed within the company. Boliden strive to run a responsible business and expect it's business partners to do the same. Good business ethics is essential for sustainable and successful business. Boliden has an ethics and compliance department to boost its compliance work. The department is responsible for the strategic development and coordination of Boliden's work regarding anti-money laundering, anti-corruption, competition law, sanctions, human rights, data protection, whistleblowing and Boliden's employees and management work together to create a compliance culture in which everyone knows what is expected of them - Boliden's codes of conduct. Regular risk assessments, trainings, audits and effective controls are important parts of Boliden's compliance efforts. The Group's whistleblower channel enables all employees and external stakeholders to report suspected and actual misconduct confidentially and anonymously. If misconduct is proven, disciplinary actions must be taken. Reprisals against anyone reporting misconduct in good faith will not be tolerated. Group management and the Board of Directors receive regular reports on risks, non-compliance and the status of initiatives in progress.

Boliden's Code of Conduct provides a framework for corporate responsibility based on the company's values and ethical principles. All employees and members of the Board are subject to the Code, which is based on international standards and relevant legislation. As a complement to the Code, there are internal policies that all employees are expected to comply with. Boliden strives for a sustainable value chain and therefore applies an overarching business ethics and risk management strategy when selecting business partners. The Business Partner Code of Conduct reflects the requirements placed on Boliden's own organization and sets the lowest standard of ethical conduct required of all parties in the value chain, whether Boliden is the buyer or seller. As with the internal Code of Conduct, this code is based on international standards such as the UN's Global Compact, the ILO's standard core conventions and guidance from the OECD. Compliance and sustainability risks are assessed when selecting business partners. If there is a risk of non-compliance by a business partner, a more detailed review is made. Depending on the outcome, an action plan may be developed and agreed upon, or the business relation may be terminated or rejected.

Boliden is a member of the United Nations Global Compact and works constantly to implement its ten principles, including preventing and limiting negative impact in the own operations and those of its external business partners. Boliden runs operations in countries where the risk of human rights violations is considered low. No operations are conducted anywhere in UNESCO's World Heritage List. Boliden supports the right of indigenous peoples to consultations under Svemin's interpretation of Free, Prior and Informed Consent (FPIC). Other important aspects are fair working conditions and the position Boliden has adopted against any form of harassment, discrimination and other behavior that may be considered as victimization by colleagues or related parties. In addition to this, aspects such

---

as child and forced labor as well as the freedom to form and join trade unions are taken into account when evaluating business partners.

Anti-corruption forms a central part of the ethics and compliance work, and Boliden has a zero tolerance policy regarding all types of bribery and corruption. Boliden has an anti-money laundering policy for identifying and managing risks in various parts of the business and to strengthen its anti-money laundering efforts.

### 3.5 Geology

#### 3.5.1 Regional geology

The following background is extracted from Raat (2009).

Rockliden is part of the Bothnian Basin (Figure 4). The Bothnian Basin is formed during the Svecofennian orogeny (1.87-1.82 Ga) (Kousa & Lundqvist, 2000) and represents a major part of the Fennoscandian Shield. The Bothnian Basin is limited to the north and to the south respectively by the Skellefte and the Bergslagen Proterozoic volcanic arc, which coincide with ancient subduction zones.

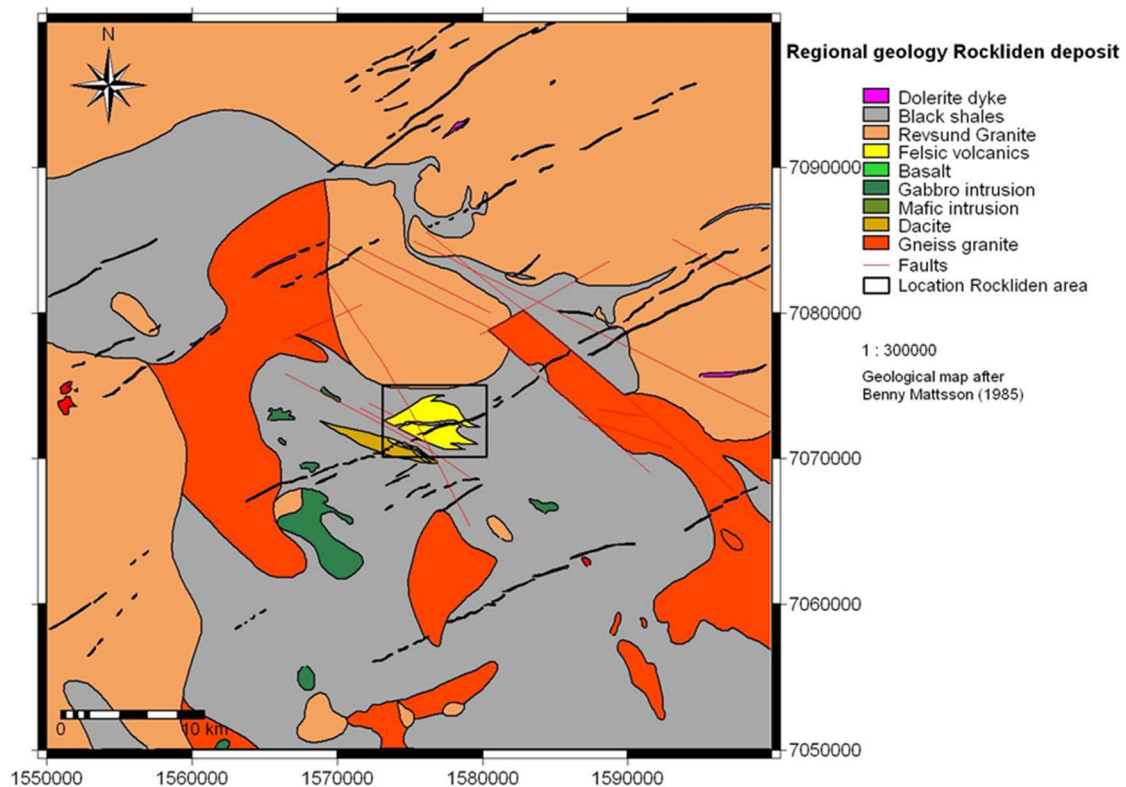


Figure 4. Overview of the regional geology after Mattsson & Heeroma (1985). A square box in the middle indicates the location of Rockliden. A zoom-in on the local geology can be seen in Figure 5.

The supracrustal rocks of the Bothnian Basin are defined as the Härnö Group (2,0-1,87 Ga) by Kousa & Lundqvist (2000). The Härnö Group is mainly composed of turbiditic greywackes and argillitic metasedimentary rocks with minor intercalations of mainly mafic but also felsic volcanic rocks. Several granitoid intrusions, belonging to the Svecofennian orogeny (1,87-1,82 Ga), are noticed and spread over the Bothnian Basin. Late intruding dolerite dykes (1,27-1,22 Ga) occur in a NE-SW trending direction crosscutting the basin.

#### 3.5.2 Local Geology

The Rockliden area is dominated by metasedimentary rocks of greywackes and shales surrounded by young granitoid intrusions and enclaves of both coherent and volcanoclastic rhyolites and dacites.

### 3.5.3 Property geology

The area hosts the known mineralization's of Rockliden and Skravelåsen South and is composed of a volcanic stratigraphy of intervening coherent dacites (orange) and volcanoclastic rhyolites (yellow) striking east-west to southwest-northeast, and dipping 70° to 80° (Figure 5). Several smaller volcanic lenses are found east and north of the main area and numerous mafic dykes in the entire area.

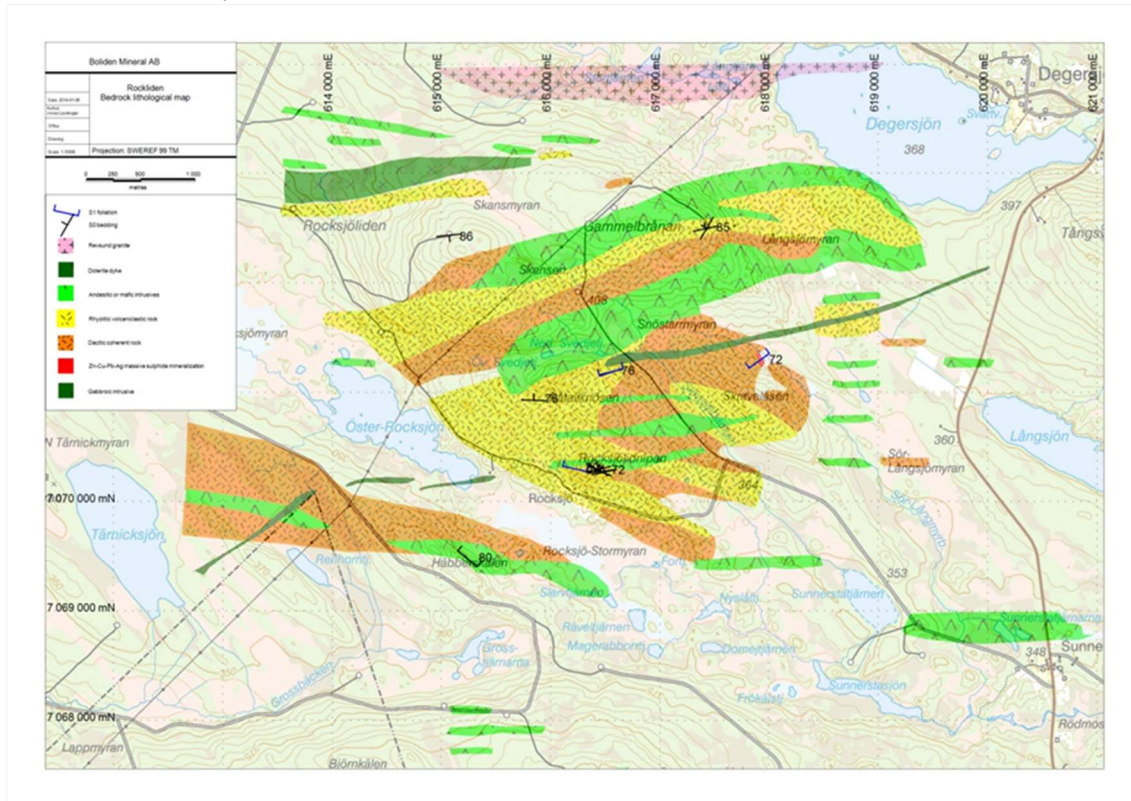


Figure 5. The 2013 geological map of the Rockliden area volcanic rocks based on outcrop data and bedrock rock chip geochemistry.

### 3.5.4 Mineralization

The Rockliden mineralization is interpreted to be a typical Volcanic Massive Sulphide (VMS) deposit. The main economic minerals of interest are sphalerite (ZnS), chalcopyrite (CuFeS<sub>2</sub>) and galena (PbS). The Rockliden mineralization shows a complex geometry of faulting and folding. The deposit has probably formed as one single lens, which has been subjected to deformation after deposition. The deformation and shearing has resulted in at least seven massive sulphide lenses over a minimum of 400 m strike length. Later remobilization along fault planes has been transporting mainly chalcopyrite and pyrrhotite, forming secondary, but significant, lenses.

The Rockliden deposit can be divided into three different parts.

1. massive sulphides in the main mineralization (sphalerite, chalcopyrite, silver/tetrahedrite, pyrrhotite, pyrite)
2. weak to strong impregnation and stringer mineralization below the massive sulphides (chalcopyrite, pyrrhotite, pyrite)
3. remobilized ore shoots along fault planes (chalcopyrite and pyrrhotite)

The massive sulphide intersections are dominated by pyrite, pyrrhotite, chalcopyrite, sphalerite, galena, tetrahedrite and bournonite. Antimony (Sb) occurs in tetrahedrite and bournonite. The lenses pinch and swell substantially and true thicknesses varies from 5 to 20 m. Zonation occurs repeatedly in all massive sulphide lenses. In the primary lenses, the lower part of the stratigraphy, close to the footwall, is in general richer in copper impregnation and stringer mineralization. The middle part of the lenses is generally richest in zinc. The part closest to the hanging wall is commonly rich in pyrrhotite and copper. Zinc grades increase and copper decrease towards the central part of the deposit. Copper, zinc and silver grades are consistent towards the deeper part of the mineralization whereas antimony grades decrease. Smaller intervals of strong impregnation to semi-massive arsenopyrite are common in most massive sulphide intersections, and generally correlate with increased values of arsenic, antimony and lesser mercury. Sulphosalts occur around wall rock fragments and in fractures in some lenses.

The thickness of the impregnation zone just below the massive sulphides is irregular. It can vary from one meter up to 30 meters or more and consists of mainly pyrite and pyrrhotite. Chalcopyrite impregnations vary from weak to strong and increase towards the massive mineralization. Arsenopyrite is noticed here and there and increase towards the massive mineralization.

### 3.6 Exploration procedures and data

#### 3.6.1 Drilling techniques

Boliden has explored the area in campaigns using diamond drilling since the discovery in 1982. A total of 161 diamond drill holes have been drilled towards the Rockliden mineralization and in its vicinity. Different drill entrepreneurs have performed the drilling, see Table 3.

Table 3. Diamond drilling performed in Rockliden area.

Contractor	Period	Hole no. (ROD-ROE)	Total length	Hole Size (mm)
Boliden Mineral AB	1982-1984	1-67	12 343 m	46 mm
Boliden Mineral AB	1984-1986	68-102	10 786 m	56 and 58 mm
RATE/Bergteamet	2007-2009	103-114	8 474 m	56 mm
Drillcon/Smoy	2010	115-119 (not 118)	3 168 m	?
Protek	2011	120-131	5 046 m	?
Styrud	2012	132-142	10 426 m	75.7 mm
Styrud/Devico	2013	143-163	10 426 m	75.7 mm
<b>Total 158 holes</b>			<b>56 170 m</b>	

In the early 80's, it was normal to use 46mm rods (ROE 1 –67), especially for drilling short holes. However, the deviation of the slightly deeper holes (+300m) was sometimes problematic. Therefore, when drilling deeper holes, 58mm rods and a stronger engine resulted in straighter holes (ROE 68-102). During the drill campaign (2007-2009) 56mm rods were used (ROE 103-114). No information about used rod dimensions during drill campaigns 2010-2011 are to be found in reports or database. During the drill campaign 2012-2013 directional drilling with Devico was used producing two different kinds of drill core

---

sizes of 36,5 mm (during directional drilling a smaller core is produced) and 47,6 mm respectively.

### **3.6.2 Downhole surveying**

All holes from the first drill campaign (except ROE 102) have been measured for deviation with Boliden in-house deviation tool BHMK. Around 90% of the holes have been measured by BHEM (down hole electromagnetics). During the last major drill campaigns all holes have been measured for deviation and down hole EM. This information is valuable for interpretation and decision making statements, concerning when to finish the hole.

### **3.6.3 Sampling**

The majority of the sampled material deals with drilled core with an average diameter of around 42mm with 56mm rods. Assay samples follow geological boundaries and try to cover mineralized section in a homogenous way (separating (strong) impregnations from semi-massive from massive). Drill core sections vary between 0.10 and 7.40m, with an average length of 2 meter (1.96m). After logging and indicating sections for analysis, the core was split lengthwise with a hydraulic splitter. A water driven rock saw was used during the last drill campaign (Raaf, 2009).

Samples were prepared according to international standards by the representative laboratories. This includes weighting, drying, crushing, splitting and pulverizing to 75 microns before starting analysis (Raaf, 2009).

### **3.6.4 Density**

Density measurements have been done on drill core from the mineralized parts of the deposit. In 2010 the measurements from 2009 and 1985 were compared to the standard density formula for massive sulphides used by Boliden (Wiik, 2009):

$$\text{Density} = 2.7 + 0.0043\text{Cu} + 0.004\text{Zn} + 0.02\text{Pb} + 0.027\text{As} + 0.0375\text{S}$$

(Larsson & Agmalm, 1994)

The results show weak linear relations between measured density and theoretical density. In general measurements give higher density compared to formula. Especially measured massive sulphides give higher density (about 10%). This goes for both 1985 and 2009 measurements (Figure 6).

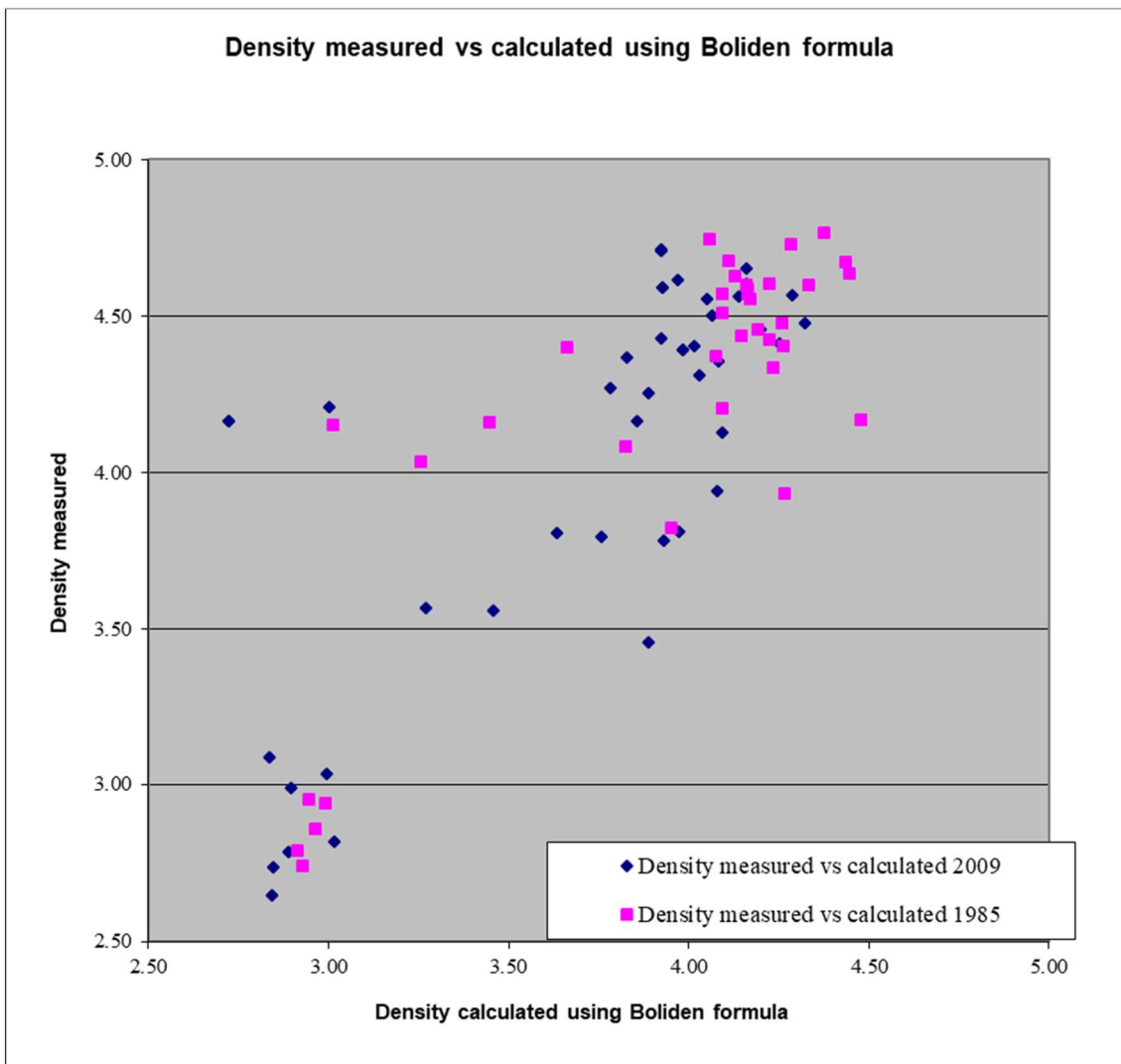


Figure 6. Weak linear relations between measured density and theoretical density.

After raising the S factor in the standard formula from 0.0375 to 0.047 by “trial-and-error method” the relation seems more linear (Figure 7). This could be due to the presence of pyrrhotite in the deposit and not in the formula.

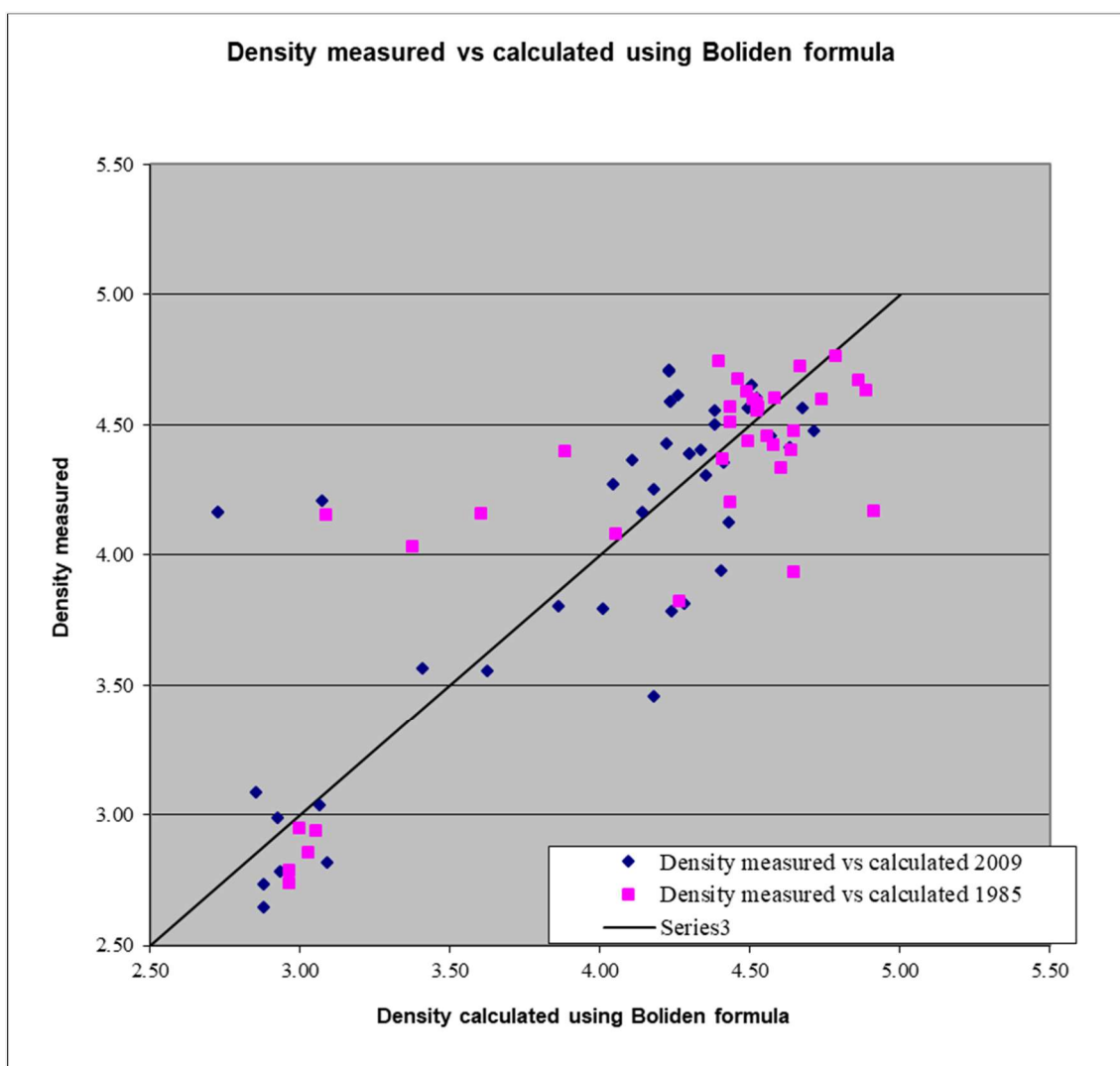


Figure 7. More linear relations after raising the S factor in the formula.

Formula used in this estimation is the same as the one used in 2009:

$$\text{Density} = 2.7 + 0.0043\text{Cu} + 0.004\text{Zn} + 0.02\text{Pb} + 0.027\text{As} + 0.047\text{S}$$

### 3.6.5 QAQC

No information can be given on the quality control of assay samples during the drill campaign in the 1980's (Raat, 2009).

During the drill campaign 2007-2009, around every 20th sample has been duplicated. Several samples from ROE 107, 108, 111 and 114 were sent to Rönnskär for quality control. Results are generally good. Au and Sb do not show linear relations probably due to element detection limits (Raat, 2009). Apart from duplicates no reference samples, blanks, randomisation or other types of controls have been used.

No information is found regarding the QAQC system and results from drill campaign 2010.



---

In 2011 international standards were sent with the batches, 1-1.5% standards in one batch according to internal recommendations by Boliden Mineral.

During drill campaign 2012-2013 standards, blanks and check assays has been sampled as described in the company QAQC policy. Standards and check assays are used to monitor the accuracy in analysis. International standards GBM308-13, GBM309-16 and GBM908-14 are added to every batch with 2-2.5% frequency. Blanks are added with a frequency of 2%, minimum one blank per batch. Blanks are used to check the possible contamination in the lab. The blank samples are silica sand and are placed after high grade samples. None of the blanks values are too high according to the company QAQC policy.

Check assays are added with 1% frequency or minimum one per batch. Check assays are analyzed in the Rönnskar lab to account for any errors by ALS Chemex. Most differences are within 5%. However, one sample for silver in ROE 136 and one for lead in ROE 137 by far exceeds the acceptable level. Duplicates are not sampled constantly and will therefore not be report (Lasskogen, 2013).

### **3.7 Exploration activities**

No exploration activities occurred in the Rockliden area during 2023.

### **3.8 Mining methods, processing and infrastructure**

There is no Mineral Reserve defined in Rockliden but some mining assumptions are used in the Mineral Resource estimation. The following chapter is extracted from the Boliden internal Scoping study final report, Årebäck (2014).

#### **3.8.1 Mining methods**

Scoping study level investigations shows that the main mining alternative for Rockliden is a minor open pit, in combination with underground open stoping mining.

#### **3.8.2 Mineral processing**

Mineral processing of the Rockliden deposit aims to produce two separate concentrates (copper and zinc). According to results from laboratory tests, done on material from drill core the ore is fine grained and requires a fine grinding size in order to obtain good metal recoveries.

The upper parts of the lenses have a high concentration of lead and antimony, which pollutes the copper concentrate. Using conventional flotation will produce a copper concentrate high in Sb and a zinc concentrate high in Hg. To get the concentrates salable will require further treatment such as Cu/Pb-separation or Sb sulphide. The Boliden in-house Technical department has performed several separate R & D-projects on these issues.

### **3.9 Prices, terms and costs**

Anticipated operational costs at an underground operation in Rockliden with a small process plant is set to a minimum of 500 SEK/t. The cut-off of 500 SEK/ton was chosen as reasonable when evaluating mining- and processing costs in Boliden operations using similar mining methods. For the Mineral Resource estimate, a cut-off of 500SEK/ton was used as a guide to identify the area for the resource estimation

The present Mineral Resource Estimation was made in 2013, prices and exchange rates used for the estimation are presented in Table 4.

Table 4. Long term planning prices and exchange rates (LTP) used for the Mineral Resource estimation.

<b>Metal/exchange rate</b>	<b>Long-term planning terms, 2013</b>
Copper	USD 6 600/tonne
Zinc	USD 2 300/ton
Lead	USD 2 300/ton
Gold	USD 1 200/tr.oz
Silver	USD 20/tr.oz
USD/SEK	6.50

### 3.10 Mineral resources

All information about the most recent mineral resource estimation is from report Rockliden Resource Estimation 2014 by Boliden employee Lina Åberg. Boliden changed reporting standards in 2018 from Fennoscandian Review Board (FRB) to the Pan-European Reserves and Resources Reporting Committee (PERC) “PERC Reporting Standard 2017”. The reports and estimations summarized here are compiled according to the previous standard (FRB) but intends to comply with PERC. Boliden consider this data accurate and reliable.

Mineralized domains were defined, using CAD program Microstation with ad-on program Propack, based on analyzed grades in drill hole sections and geological 2D interpretations (horizontal and profile). 2D ore interpretations were drawn based on the defined ore sections along drill holes.

Based on the 2D ore interpretations a three dimensional model was made and a block model was created within the domains.

Block model with block size set to 5\*5\*10m (x, y and z respectively) with one subdivision was used.

Gold, silver, copper, zinc, lead, arsenic, sulphur, antimony and bismuth have been continuously assayed in all newer drill holes but for older drill holes arsenic, sulphur, antimony and bismuth are not continuously assayed. These sections were left as absent values which means that the estimation is done with fewer data and the grades from the vicinity will blend in.

Non analyzed sections within the domains are made up of cross-cutting intrusive non mineralized geological units. These sections were after discussions with the project geologist set to zero grades for all elements.

Composite assay data (histograms) from the different domains showed that top capping was not necessary for any elements.

No limitation in composite length was given, which means that composite length = drill hole section length. In early stage estimations with sparse drill hole information this gives a stable estimation. The estimation does not give grade variation across the ore.

Gold, silver, copper, zinc, lead, arsenic, sulphur, antimony and bismuth were estimated for all domains in the Rockliden mineralization using Inverse Power of distance.

The Rockliden mineralization is classified as Inferred or Indicated Mineral resource (Table 5 and Figure 8). The classification is based on geological understanding and continuity together with quality and quantity of drill hole data. A drill spacing of 80x80 m is used as a guide for Inferred Resource and reasonable assumed geological continuity in combination with a 40x40 m drill pattern is used for Indicated Resource.

Table 4. Rockliden Mineral Resource statement 2023, figures are presented with 15% waste dilution.

<b>Mineral Resources Classification</b>	<b>Kton</b>	<b>Au (g/t)</b>	<b>Ag (g/t)</b>	<b>Cu (%)</b>	<b>Zn (%)</b>	<b>Pb (%)</b>	<b>As (%)</b>	<b>Sb (g/t)</b>
<b>Indicated</b>	800	0.08	102	2.1	4.4	0.9	0.9	1800
<b>Inferred</b>	9 190	0.05	47	1.7	3.9	0.4	0.6	670

Generally the deposit, and the central lens in particular, is quite densely drilled down to 200m. The geological relations in this area are also consistent, hence this part of the central lens is classified as Indicated resource. The rest of the central Ore down to ca 300m are classified as Inferred Mineral resource. The two other major lenses are classified as Inferred Mineral resource.

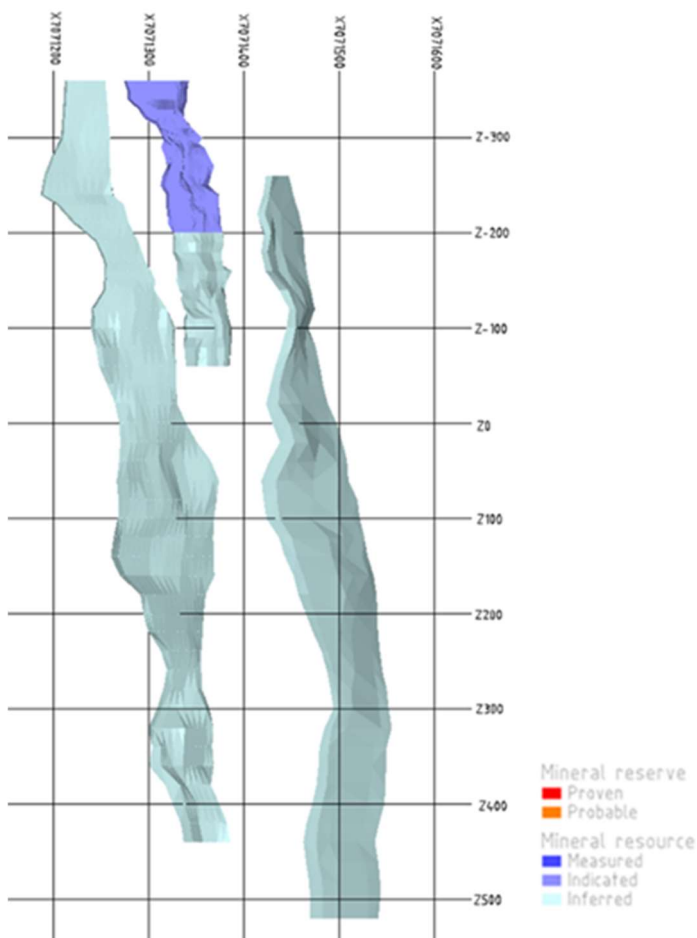


Figure 8. Overview of the Rockliden Mineral Resources (looking west in national coordinate system R90).

---

### 3.11 Mineral reserves

There is currently no mineral reserve classified for the Rockliden project.

### 3.12 Comparison with previous year

No changes have been made to mineral resources in the Rockliden project since 2013. The first resource estimation for Rockliden was made in 1985. At this date, three different estimations have been made for Rockliden (Table 6).

Table 6. Comparison with previous resource estimations. Figures represent total tonnage (i.e. indicated and inferred).

<b>Estimation</b>	<b>Resource Mt</b>	<b>Au (g/t)</b>	<b>Ag (g/t)</b>	<b>Cu (%)</b>	<b>Zn (%)</b>	<b>Pb (%)</b>	<b>As (%)</b>	<b>S (%)</b>	<b>Sb (g/t)</b>
<b>1985</b>	2.2	-	94	2.0	5.6	0.9	0.9	27	0.18
<b>2010</b>	4,6	0.1	78	1.9	4.3	0.7	0.6	22	0.14
<b>2013</b>	10	0.1	51	1.7	3.9	0.5	0.6	24	0.08

Exploration drilling toward depth during 2012 and 2013 led to more geological knowledge and more analytical support to increase the total resource.

### 3.13 Reconciliation

Not applicable for this project due to no production.

---

## 4 REFERENCES

### 4.1 Public references

**Kousa, J., Lundqvist, Th., 2000.** Svecofennian Domain. In: Lundqvist, Th., Autio, S. (Eds.), Description to the bedrock map of Central Fennoscandia (Mid-Norden). Geological Survey of Finland, Special Paper 28, 47–75

Pan-European Standard for reporting of Exploration results, Mineral Resources and Mineral Reserves (The PERC Reporting standard 2017. [www.percstandard.eu](http://www.percstandard.eu))

### 4.2 Boliden Internal references

**Mattsson, B. and Heeroma, P., 1985.** Rockliden Prospekteringsresultat 1981-1985, Boliden Mineral AB, Boliden Internal report GP 85 005 2.

**Raat, H., 2009.** Geology, grade and tonnage estimate of the Rockliden VMS deposit, North Central Sweden. Boliden Internal GP2009-34.

**Wiik, J., 2010.** Rockliden Resource and Exploration Results Estimate. Boliden internal report MG report 463/2010 DMS#333292.

**Åberg, L., 2014.** Rockliden Mineral Reserves and Mineral Resource statement 2013-12-31. Boliden internal report DMS#662458.

**Åberg, L., 2014.** Rockliden Resource Estimation 2014. DV report 2014/10. Boliden internal report DMS#746843.

**Åberg, L., Lasskogen, J., 2014.** Rockliden Conceptual Study – Geology and Mineral Resources. DV report 2014/13 and GP 2014-17. Boliden internal report DMS#730948.

**Årebäck, H., 2014.** Rockliden\_Dorotea Conceptual Study 2013-14 Final Report. Technical report 2014/014. Boliden internal report DMS#756716.